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# Biological Resources Assessment

## LOWER DEER CREEK

### UNINCORPORATED TEHAMA COUNTY, CALIFORNIA

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## LIST OF ACRONYMS AND ABBREVIATIONS

CCR	California Code of Regulations
CDFG	California Department of Fish and Game
CDFW	California Department of Fish and Wildlife
CESA	California Endangered Species Act
CEQA	California Environmental Quality Act
CFGC	California Fish and Game Code
CFR	Code of Federal Regulations
CNDDDB	California Natural Diversity Database
CNPS	California Native Plant Society
Corps	U.S. Army Corps of Engineers
CSRL	California Soil Resources Lab
CWA	Clean Water Act
DPS	Distinct Population Segment
ESA	Federal Endangered Species Act
ESU	Evolutionary Significant Unit
Inventory	CNPS Inventory of Rare and Endangered Plants
MBTA	Migratory Bird Treaty Act
Rank	California Rare Plant Rank
RWQCB	Regional Water Quality Control Board
SVRIC	Stanford Vina Ranch Irrigation Company
USFWS	U.S. Fish and Wildlife Service
VELB	Valley elderberry longhorn beetle
VPFS	vernal pool fairy shrimp
VPTS	vernal pool tadpole shrimp
WRA	WRA, Inc.

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## **1.0 INTRODUCTION**

On April 3-5, 2018, WRA, Inc. (WRA) performed an assessment of biological resources within an approximately 2,827-acre assessment area centered on the mainstem of lower Deer Creek from the Red Bridge to the Stanford Vina Ranch Irrigation Company (SVRIC) Diversion Dam and including surrounding areas (Study Area), located in Tehama County, California (Figure 1). The Study Area includes portions to the entireties of 23 land parcels, several of which (particularly south of the Deer Creek) are currently dedicated largely to orchards and other intensive agriculture. In addition to Deer Creek and associated sloughs, most of the rest of the Study Area is relatively undeveloped and consists predominantly of grassland/pastureland. This assessment occurred in support of the Deer Creek Watershed Conservancy's proposed Lower Deer Creek Flood and Ecosystem Improvement Project (Project). The Project aims to directly improve flood protections, maintain and improve passage for migrating anadromous salmonids, and otherwise improve habitat and water quality along the stream via a series of related actions within the Study Area (e.g., construction of setback levees, expanding floodplain habitat, etc.).

This report describes the results of the site visit, which assessed the Study Area for the (1) potential to support special-status species; and (2) presence of other sensitive biological resources protected by local, state, and federal laws and regulations. If special-status species were observed during the site visit, they were recorded. Specific findings on the habitat suitability or presence of special-status species or sensitive habitats may require that protocol-level surveys be conducted.

A biological resources assessment provides general information on the potential presence of sensitive species and habitats. The biological assessment is not an official protocol-level survey for listed species that may be required for project approval by local, state, or federal agencies. This assessment is based on information available at the time of the study and on site conditions that were observed on the date of the site visit.

Figures are included in Appendix A; a list of plant and wildlife species observed during the site visits is included as Appendix B. An assessment of all of the special-status species documented from the general vicinity and their potential to occur in the Study Area is included as Appendix C. Representative photographs of the Study Area are included as Appendix D.

## **2.0 REGULATORY BACKGROUND**

The following sections explain the regulatory context of the biological assessment, including applicable laws and regulations that were applied to the field investigations and analysis of potential project impacts.

### **2.1 Sensitive Biological Communities**

Sensitive biological communities include habitats that fulfill special functions or have special values, such as wetlands, streams, or riparian habitat. These habitats are protected under federal regulations such as the Clean Water Act (CWA); state regulations such as the Porter-Cologne Act, the California Department of Fish and Wildlife (CDFW) Lake and Streambed

Alteration Program, and the California Environmental Quality Act (CEQA); or local ordinances or policies such as city or county tree ordinances, Special Habitat Management Areas, and General Plan Elements.

### 2.1.1 Waters of the United States

The U.S. Army Corps of Engineers (Corps) regulates “Waters of the United States” under Section 404 of the Clean Water Act. Waters of the U.S. are defined in the Code of Federal Regulations (CFR) as waters susceptible to use in commerce, including interstate waters and wetlands, all other waters (intrastate waterbodies, including wetlands), and their tributaries (33 CFR 328.3). Potential wetland areas, according to the three criteria used to delineate wetlands as defined in the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987), are identified by the presence of (1) hydrophytic vegetation, (2) hydric soils, and (3) wetland hydrology. Areas that are inundated at a sufficient depth and for a sufficient duration to exclude growth of hydrophytic vegetation are subject to Section 404 jurisdiction as “other waters” and are often characterized by an ordinary high water mark. Other waters, for example, generally include lakes, rivers, and streams. The placement of fill material into Waters of the U.S generally requires an individual or nationwide permit from the Corps under Section 404 of the CWA.

### 2.1.2 Waters of the State

The term “Waters of the State” is defined by the Porter-Cologne Act as “any surface water or groundwater, including saline waters, within the boundaries of the state.” The Regional Water Quality Control Board (RWQCB) protects all waters in its regulatory scope and has special responsibility for wetlands, riparian areas, and headwaters. These waterbodies have high resource value, are vulnerable to filling, and are not systematically protected by other programs. RWQCB jurisdiction includes “isolated” wetlands and waters that may not be regulated by the Corps under Section 404. Waters of the State are regulated by the RWQCB under the State Water Quality Certification Program which regulates discharges of fill and dredged material under Section 401 of the CWA and the Porter-Cologne Water Quality Control Act. Projects that require a Corps permit, or fall under other federal jurisdiction, and have the potential to impact Waters of the State, are required to comply with the terms of the Water Quality Certification determination. If a proposed project does not require a federal permit, but does involve dredge or fill activities that may result in a discharge to Waters of the State, the RWQCB has the option to regulate the dredge and fill activities under its state authority in the form of Waste Discharge Requirements.

### 2.1.3 Streams, Lakes, and Riparian Habitat

Streams and lakes, as habitat for fish and wildlife species, are subject to jurisdiction by the CDFW under Sections 1600-1616 of California Fish and Game Code (CFGC). Alterations to or work within or adjacent to streambeds or lakes generally require a 1602 Lake and Streambed Alteration Agreement. The term “stream”, which includes creeks and rivers, is defined in the California Code of Regulations (CCR) as “a body of water

that flows at least periodically or intermittently through a bed or channel having banks and supports fish or other aquatic life [including] watercourses having a surface or subsurface flow that supports or has supported riparian vegetation” (14 CCR 1.72). In addition, the term “stream” can include ephemeral streams, dry washes, watercourses with subsurface flows, canals, aqueducts, irrigation ditches, and other means of water conveyance if they support aquatic life, riparian vegetation, or stream-dependent terrestrial wildlife (CDFG 1994a). “Riparian” is defined as “on, or pertaining to, the banks of a stream.” Riparian vegetation is defined as “vegetation which occurs in and/or adjacent to a stream and is dependent on, and occurs because of, the stream itself” (CDFG 1994a). Removal of riparian vegetation also requires a Section 1602 Lake and Streambed Alteration Agreement from CDFW.

#### 2.1.4 Other Sensitive Biological Communities

Other sensitive biological communities not discussed above include habitats that fulfill special functions or have special values. Natural communities considered sensitive are those identified in local or regional plans, policies, regulations, or by the CDFW. CDFW ranks sensitive plant communities (or “vegetation alliances”) as “threatened” or “very threatened” and keeps records of their occurrences in its California Natural Diversity Database (CNDDDB; CDFW 2018a). Sensitive plant communities are also identified by the CDFW (CDFW 2018b, CNPS 2018a). Vegetation alliances are ranked 1 through 5 based on NatureServe’s (2010) methodology, with those alliances ranked globally (G) or statewide (S) as 1 through 3 considered sensitive. Impacts to sensitive natural communities identified in local or regional plans, policies, or regulations or those identified by the CDFW or U.S. Fish and Wildlife Service (USFWS) must be considered and evaluated under CEQA (CCR Title 14, Div. 6, Chap. 3, Appendix G). Specific habitats may also be identified as sensitive in city or county general plans or ordinances.

## **2.2 Local Policies, Ordinances, and Regulations**

### 2.2.1 Tehama County General Plan

#### *Policy OS-3.1*

The County shall preserve and protect environmentally-sensitive and significant lands and water valuable for their plant and wildlife habitat, natural appearance, and character. Significant wildlife and wildlife habitats shall be protected through designations under the Natural Resource Conservation Land Use Classifications.

- Natural Resource Areas: Riparian habitats will be identified and afforded protection through regulation of land use, vegetation removal, and use setbacks or natural buffers.
- Habitat Resources: To protect and maintain documented, significant wildlife habitats for their aesthetic and ecological values. Areas which are designated as significant natural by CNDDDB, CNPS, and/or CDFW, and are areas defined as supporting habitat for sensitive animal and plant species. These lands should remain in their natural states, yet may allow wilderness study, grazing and passive

recreational activities (hiking, nature study) if these activities do not threaten the integrity of the habitat. These areas are afforded protection through regulation of land use, vegetation removal, and siting of structures.

*Policy OS-3.2*

The County shall protect areas identified by the California Department of Fish and Game and the California Natural Diversity Data Base as critical riparian zones. Resource Lands shall be designated on General Plan Land Use Diagram using the subcategories discussed above. Lands designated with a Natural Resource Designation (Habitat Resources or Resource Lands) shall be zoned with the Natural Resources zoning designation.

*Policy OS-3.7*

The County shall promote best management practices of natural resources that will enhance wildlife habitat. Water diversions/dams constructed along anadromous fish streams shall be designed to protect fish populations and to ensure adequate flow levels for spawning activity during migratory seasons in accordance with State and Federal regulations.

*Policy OS-6.3*

The County shall promote the reestablishment of native under story species. Encourage restoration of native plants as an alternative to exotic grasses. (Native plants will reduce weeds and may provide a longer grazing season for livestock.) Encourage diverse under story vegetation including shrubs. (Habitat with multiple layers of vegetation provide habitat for many bird species.)

## **2.3 Special-Status Species**

### 2.3.1 Plants

Special-status plants include species/taxa that have been listed as endangered or threatened, or are formal candidates for such listing, under the federal Endangered Species Act (ESA) and/or California Endangered Species Act (CESA). Plant species on the California Native Plant Society (CNPS) Rare and Endangered Plant Inventory (Inventory) with California Rare Plant Ranks (Rank) of 1, 2, and 3 are also considered special-status plant species and must be considered under CEQA. Rank 4 species are afforded little or no protection under CEQA, but are included in this analysis for completeness. A description of the CNPS Ranks is provided below in Table 1.

**Table 1. CNPS Ranks and Threat Codes**

<b>California Rare Plant Ranks (formerly known as CNPS Lists)</b>	<b>Definition</b>
Rank 1A	Presumed extirpated in California and either rare or extinct elsewhere
Rank 1B	Rare, threatened, or endangered in California and elsewhere
Rank 2A	Presumed extirpated in California, but more common elsewhere
Rank 2B	Rare, threatened, or endangered in California, but more common elsewhere
Rank 3	Plants about which more information is needed - A review list
Rank 4	Plants of limited distribution - A watch list
<b>Threat Codes</b>	<b>Definition</b>
0.1	Seriously threatened in California
0.2	Moderately threatened in California
0.3	Not very threatened in California

### 2.3.2 Wildlife

As with plants, special-status wildlife include species/taxa that have been listed or are formal candidates for such under ESA and/or CESA. Under ESA, marine species and anadromous fishes (e.g., migratory salmonids) are within the jurisdiction of the National Marine Fisheries Services (NMFS), while remaining species are within the jurisdiction of the USFWS. The federal Bald and Golden Eagle Protection Act provides relatively broad protections to both of North America’s eagle species (bald [*Haliaeetus leucocephalus*] and golden eagle [*Aquila chrysaetos*]) that in some regards are similar to those provided by ESA. The CFGC designates some species as Fully Protected (CFP), which indicates that take of that species cannot be authorized through a state permit. Additionally, CDFW Species of Special Concern (species that face extirpation in California if current population and habitat trends continue) and USFWS Birds of Conservation Concern are considered special-status species. Although species in the two latter categories generally have no special legal status, they are typically given special consideration under CEQA. In addition to regulations for special-status species, most native birds in the United States, including non-status species, are covered by the Migratory Bird Treaty Act of 1918 and CFGC, i.e., sections 3503, 3503.5 and 3513. Under these laws/codes, deliberately destroying or collecting active nests, eggs, and young is illegal. For bat species, the Western Bat Working Group (WBWG) designates conservation status for species of bats, and those with a high or medium priority are typically given special consideration under CEQA.

### 2.3.3 Critical Habitat

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

## **3.0 METHODS**

On April 3-5, 2018, the Study Area was traversed on foot to determine (1) plant communities present within the Study Area, (2) if existing conditions provided suitable habitat for any special- status plant or wildlife species, and (3) if sensitive habitats are present. All plant and wildlife species encountered were recorded and are summarized in Appendix A and Appendix B. Plant nomenclature follows the Jepson eFlora (Jepson Flora Project 2018), except where noted. For cases in which regulatory agencies, CNPS, or other entities base rarity on older taxonomic treatments, precedence was given to the treatment used by those entities.

### **3.1 Soils**

The Soil Survey of Tehama County (USDA 1967) and an online soil survey (CSRL 2018) were examined to determine soil type and mapping extent within the Study Area.

### **3.2 Biological Communities**

Prior to the site visit, potential aquatic features were identified using remote sensing software eCognition 9.3 and ArcGIS 10.3. This analysis was conducted using a recent near-infrared aerial photograph of the site. Potential aquatic features were identified by their unique aerial signature, mapped, and exported into ArcGIS format for analysis and field map creation. These results were used to guide the field investigation and identify areas that needed closer examination and mapping refinement. Additionally, the Soil Survey of Tehama County, California (USDA 1967) and aerial imagery (Google Earth 2018) were examined to determine if any unique soil types that could support sensitive plant communities and/or aquatic features were present in the Study Area. Biological communities present in the Study Area were classified based on existing plant community descriptions described in *A Manual of California Vegetation, Online Edition* (CNPS 2018b). In some cases, it is necessary to identify variants of community types or to describe non- vegetated areas that are not described in the literature. Biological

communities were classified as sensitive or non-sensitive as defined by CEQA and other applicable laws and regulations.

### 3.2.1 Non-sensitive Biological Communities

Non-sensitive biological communities are those communities that are not afforded special protection under state, federal, and local laws, regulations and ordinances. These communities may, however, provide suitable habitat for some special-status plant or wildlife species and are identified or described in Section 4.2.1.

### 3.2.2 Sensitive Biological Communities

Sensitive biological communities are defined as those communities that are given special protection applicable federal, state, and local laws, regulations and ordinances. Applicable laws and ordinances are discussed above in Section 2.0. Special methods used to identify sensitive biological communities are discussed below.

### 3.2.3 Other Sensitive Biological Communities

The Study Area was evaluated for the presence of other sensitive biological communities, including riparian areas, and sensitive plant communities recognized by the CDFW. Prior to the site visit, aerial photographs (Google Earth 2018), local soil maps (USDA 1967), and *A Manual of California Vegetation* (CNPS 2018b) were reviewed to assess the potential for sensitive biological communities to occur in the Study Area. As discussed above in Section 2.1, all vegetation alliances within the Study Area with a CDFW-ranking of 1 through 3 were considered sensitive biological communities and mapped. These communities are described in Section 4.2.2.

## **3.3 Special-Status Species**

### 3.3.1 Literature Review

Potential occurrence of special-status species in the Study Area was evaluated by first determining which special-status species occur in the vicinity of the Study Area through a literature and database search. Database searches for known occurrences of special-status species focused on the Vina 7.5-minute USGS quadrangle as well as the eight surrounding quadrangles (USGS 2015a-i). The following resources were reviewed to determine which special-status plant and wildlife species have been documented to occur in the vicinity of the Study Area:

- CNDDDB records (CDFW 2018a)
- USFWS Information for Conservation and Planning Database (USFWS 2018)
- CNPS Inventory records (CNPS 2018b)
- Consortium of California Herbaria (CCH 2017)
- CDFG publication *California Bird Species of Special Concern* (Shuford and Gardali 2008)
- eBird: an online database of bird distribution and abundance (eBird 2018)

- CDFW and University of California Press publication *California Amphibian and Reptile Species of Special Concern* (Thomson et al. 2016)
- *A Field Guide to Western Reptiles and Amphibians* (Stebbins 2003)
- Habitat for Threatened & Endangered Species: online mapping tool (USFWS 2018)

### 3.3.2 Site Assessment

A site visit to the Study Area was conducted on April 3-5, 2018 to search for suitable habitats for special-status species. Habitat conditions observed in the Study Area were used to evaluate the potential for presence of special-status species based on these searches and the professional expertise of the investigating biologists. The potential for each special-status species to occur in the Study Area was then evaluated according to the following criteria:

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

The site assessment is intended to identify the presence or absence of suitable habitat for each special-status species known to occur in the vicinity to determine its potential to occur in the Study Area. The site visits do not constitute a protocol-level survey and are not intended to determine the actual presence or absence of a species.

In cases where little information is known about species occurrences and habitat requirements, the species evaluation was based on best professional judgment of WRA biologists with experience working with the species and habitats. If necessary, recognized experts in individual species biology were contacted to obtain the most up to date information regarding species biology and ecology.

For some species, a site assessment visit at the level conducted for this report may not be sufficient to determine presence or absence of a species to the specifications of regulatory agencies. In these cases, a species may be assumed to be present or further protocol-level special-status species surveys may be necessary. Special-status species for which further protocol-level surveys may be necessary are described in Section 5.0.

## 4.0 RESULTS

The Study Area is located in the western and eastern portions of the Vina and Richardson Springs NW USGS 7.5-minute Quadrangle maps (USGS 2015a, 2015b), respectively, approximately 0.25 mile east of Vina, California. Highway 99 crosses through the eastern portion of the Study Area, and Deer Creek runs through the middle, from east to west. In general, topography in the Study Area is downsloping toward the southwest from the eastern side of the property. The majority of the Study Area is characterized by hilly topography with relatively undisturbed, natural vegetation types, including riparian forest and annual grasslands.

### 4.1 Soils

As per the USDA (1967) and CSRL (2018), the Study Area contains 24 soil mapping units, which are shown in Figure 2. The dominant soil units are described below.

#### 4.1.1 Keefers loam, moderately deep, 0 to 3 percent slopes.

The Keefer series consists of very deep, moderately well drained soils formed in loamy alluvium on flood plains. Slopes are 0 to 3 percent. This soil series consists of nearly level to gently sloping, well-drained soils formed in old alluvium. These soils characteristically have a surface soil of dark-brown to grayish-brown, slightly acidic loam, and a subsoil of brown, slightly acidic to neutral very cobbly clay. They are on old stream terraces and flood plains east of the Sacramento River. Elevations range from 200 to 1,000 feet. This soil is well drained. Runoff is slow, and permeability is also slow. The clay subsoil restricts the movement of roots and water through the soil. The available water holding capacity and fertility are moderate.

#### 4.1.2 Molinos fine sandy loam, deep over rock.

The Molinos series consists of well-drained to somewhat excessively drained, moderately coarse textured soils that are mostly nearly level. These soils formed in recent alluvium derived from basic igneous rocks. Molinos soils are dark grayish brown and neutral. In many places they contain some gravel in the subsoil or throughout the profile. These soils are along active streams east of the Sacramento River at elevations of 200 to 1,000 feet. This soil has an unrelated cemented layer at a depth of 36 to 60 inches but is otherwise similar to Molinos fine sandy loam. This layer is impervious to water. In places a perched water table occurs during winters of high rainfall and during the summer because of the accumulation of excess irrigation water. This water table fluctuates considerably. Included with this soil in mapping are areas of Vina soils.

#### 4.1.3 Riverwash.

Riverwash consists of channels of intermittent streams and of active streams where the water is high. The areas are made up of deposits of sand and gravel, some of which are mined. Included with Riverwash in mapping are small areas of Cortina, Columbia, Maywood, Molinos, Orland, and Vina soils.

#### 4.1.4 Tuscan cobbly loam, 1 to 5 percent slopes.

In the Tuscan series are nearly level to gently sloping, well-drained soils. These soils formed in old alluvium washed from areas of volcanic rock. The surface soil is dark-brown, slightly acidic cobbly loam, and it grades to a subsoil of reddish-brown, slightly acidic cobbly and gravelly clay loam. The subsoil is underlain by an indurated cobbly hardpan at a depth of less than 30 inches. This soil is on the tops of old, gently sloping terraces east of the Sacramento River. The areas vary considerably in size and shape, and the surface has a slightly hummocky micro-relief. Cobblestones that are nearly rounded and are 3 to 10 inches in diameter are scattered on 1 to 10 percent of the surface. In a few places these stones cover as much as 25 percent of the surface. Depth to the indurated hardpan is predominantly 10 to 20 inches. This soil is well drained and permeability is very slow. The water holding capacity and fertility are low. The hardpan is impervious to plant roots and water.

#### 4.1.5 Vina loam, 0 to 2 percent slopes, MLRA 17.

The Vina series consists of nearly level to gently sloping well-drained soils. These soils are formed in recent alluvium washed from areas of volcanic rock. They are dark grayish brown to brown, neutral, and medium textured to moderately fine textured throughout. The Vina soils are on flood plains of the Sacramento River at elevations of 200 to 1,000 feet. This soil is well drained, permeability is moderate. The available water holding capacity and fertility are high. Runoff is very slow.

## **4.2 Biological Communities**

Table 2 summarizes the area of each biological community type observed in the Study Area. There are three non-sensitive biological communities in the Study Area. There are 13 sensitive biological communities in the Study Area: riparian woodland, canal, intermittent stream, open water, perennial stream, freshwater marsh, irrigated seasonal wetland, riparian wetland, seasonal wetland, seasonal wetland ditch, vernal pool, vernal swale and willow scrub wetland. Descriptions for each biological community are contained in the following sections. An overview of the Study Area with associated sensitive aquatic communities is shown in Figure 3. Sensitive biological communities within the Study Area are shown in more detail in Figure 4. Plant species that were encountered during the site survey are presented in Appendix B-1.

**Table 2. Summary of Biological Communities in the Study Area**

<b>Community Type</b>	<b>Area within the Study Area Acres (linear feet)</b>
<b>Non-sensitive biological communities</b>	
Annual Grassland	(not mapped)
Agricultural	(not mapped)
Developed/Ruderal	(not mapped)
<b>Sensitive biological communities</b>	
Riparian Woodland	138.35
Canal	13.77 ( 51,538 LF)
Intermittent Stream	5.77 (11,970 LF)
Open Waters	3.48
Perennial Stream	55.26 (29,976 LF)
Freshwater Marsh	16.71
Irrigated Seasonal Wetland	16.95
Riparian Wetland	3.34
Seasonal Wetland	82.88
Seasonal Wetland Ditch	12.72
Vernal Pool	2.15
Vernal Swale	156.92
Willow Scrub Wetland	6.88
<b>Total (sensitive communities)</b>	<b>515.18</b>

#### 4.2.1 Non-Sensitive Biological Communities

##### *Annual Grassland*

Annual grassland typically occurs in open areas of valleys and foothills throughout California, usually on fine textured clay or loam soils that are somewhat poorly drained (Holland 1986), though it can occur on a variety of substrates. Elements of two vegetation alliances (CNPS 2017a) occur in non-native grassland in the Study Area, but they are typically too small and/or too intermixed to map separately. These alliances include *Avena (barbata, fatua)* Semi-Natural Herbaceous Stands (wild oats grasslands) and *Bromus (diandrus, hordeaceus)—Brachypodium distachyon* Semi-Natural Herbaceous Stands (annual brome grasslands). Annual grassland predominantly

occurs in the northern portion of the Study Area, and most was grazed by cattle.

#### *Developed/Ruderal*

Although not described in the literature, developed/ruderal habitats include areas that have been heavily altered by humans and may contain built structures, landscaping, gravel roads, paved areas, or other non-natural surfaces. Because they are typically in active usage, developed/ruderal areas are comprised primarily of bare ground, but ruderal herbaceous vegetation is often present and dominated by non-native annual species.

#### *Agricultural*

Within the Study Area, the areas with agricultural production generally extend along the southern boundary of Deer Creek. The majority of agricultural crops in this area are irrigated orchards, including walnuts, almonds, olives, and prunes. Other crops may include grapes or row crops, but at a lower density than orchards. Agricultural areas are generally managed on a regular basis, but may include non-native annual species including brome, wild oats, or other ruderal vegetation.

### 4.2.2 Sensitive Biological Communities

#### *Riparian Woodland*

Riparian woodland composes 138.35 acres of the Study Area, and occurs on and adjacent to the banks of Deer Creek. This is a medium to tall, broadleaved, winter deciduous, closed-canopy riparian forest dominated by California sycamore (*Platanus racemosa*), box elder (*Acer negundo*), and valley oak (*Quercus lobata*). The understory is composed primarily of willows, including narrowleaf (*Salix exigua*), red (*S. laevigata*), and arroyo willow (*S. lasiolepis*). Other understory species include white alder (*Alnus rhombifolia*), blue elderberry (*Sambucus nigra* ssp. *caerulea*), California wild rose (*Rosa californica*), and spicebush (*Calycanthus occidentalis*). This community is generally restricted to the higher parts of the floodplains of Deer Creek and its tributaries, and are therefore less subject to physical disturbance from flooding, but still receive annual hydrological inputs. This community is regulated by the CDFW under the CFGC (Section 1600 et seq.).

#### *Intermittent Stream*

Intermittent stream habitat composes approximately 5.77 acres (11,970 LF) of the Project Area. Intermittent streams form in drainages where seasonal flow is sufficient to incise channel walls and scour channel bottoms. A small network of intermittent streams is present in the northeastern portion of the Project Area and drain into Deer Creek. OHWM indicators are present, such as bed and bank, scouring, and sediment sorting. These intermittent streams are interconnected with wetland features, such seasonal swales, seasonal wetlands, and vernal pools. Vegetation is sparse-to-non-existent, and includes species such as Italian ryegrass, Mediterranean barley, and some areas have

an overstory of valley oaks and willows.

#### *Open Waters*

Open waters compose approximately 3.48 acres of the Study Area. These wetland areas are characterized by open water and low vegetation cover, although there may often be emergent vegetation, willows or trees bordering the open water areas.

#### *Perennial Stream*

The Study Area contains approximately 29,976 LF of Deer Creek, which runs east to west centrally through the Study Area. This perennial stream composes approximately 55.26 acres of the Study Area. Deer Creek is a Sacramento River tributary and originates near the summit of Butte Mountain in the Lassen National Forest. The creek flows in a southwesterly direction, passing through meadows and dense forest before descending through a steep rock canyon into the Sacramento Valley. Upon entering the canyon, Deer Creek flows across the valley floor and enters the Sacramento River approximately one mile west of the town of Vina, just outside of the Study Area (CDFW 2017).

The channel bed and banks are often rocky and composed of cobbles and boulders. The channel itself is typically unvegetated, with riparian forests or grasslands bordering. Within the Study Area, the creek is generally unrestricted, and in some areas splits into a braided channel with a floodplain of cobbles and gravel bars. Flows within the lower section of Deer Creek are diverted for agricultural uses by the SVRIC Diversion Dam. Deer Creek supports a genetically distinct population of Central Valley spring-run Chinook salmon (*Oncorhynchus tshawytscha*), as well as fall-run Chinook salmon and steelhead (*O. mykiss*) (CDFW 2017).

#### *Freshwater Marsh*

Freshwater marsh composes approximately 16.71 acres of the Study Area and typically occur in association with the lowland terminus of local riverine watersheds or as the result of artificial excavation activities in low-lying areas exhibiting historic hydric soils conditions, often resulting in artificially created impoundments, such as ponds or reservoirs. Dominant vegetation within the freshwater marshes includes: tule, Himalayan blackberry (*Rubus armeniacus*), broadleaf cattail, common rush (*Juncus effuses*), valley sedge (*Carex barbarae*), and other freshwater emergent vegetation. Freshwater marshes are known throughout California on all aspects and topographic positions, underlain by a variety of substrates, but are most frequently associated with estuarine and/or riverine systems and contain substantial muck within the soils.

Freshwater marsh within the Study Area provide varying levels of habitat for a variety of wildlife species, including tricolored blackbird (*Agelaius tricolor*), a CESA-listed species.

### *Irrigated Seasonal Wetland*

Irrigated seasonal wetlands compose approximately 16.95 acres of the Study Area. Similar to seasonal wetlands, these areas exhibit a hydrologic regime dominated by saturation, rather than inundation. Hydrology within these wetlands appeared to be provided by irrigation, in some cases causing standing water within the fields. Dominant vegetation within the irrigated seasonal wetlands includes: Italian ryegrass, Lemmon's canary grass (*Phalaris lemmonii*), Mediterranean barley, and valley sedge.

### *Riparian Wetland*

Riparian wetlands compose approximately 3.34 acres of the Study Area. Riparian wetlands generally support surface water for brief periods during the growing season, but the water table usually is situated below the soil surface for the majority of the growing season. This wetland type supports vegetation that can occur in both uplands and wetlands. Vegetation structure in riparian wetlands often varies, and can include mature stands of riparian trees or complex suites of low-lying shrubs and forbs. Freshwater forested/shrub riparian wetlands were observed throughout the Study Area and were situated along Deer Creek, drainage channels, and irrigation canals. As all riparian wetlands in the Study Area are located within the Deer Creek floodplain, they are subject to temporary inundation during flood events.

### *Seasonal Wetland*

Seasonal wetlands compose approximately 82.88 acres of the Project Area and occur in topographic, usually closed depressions where seasonal inundation and/or saturation occur for a minimum of 14 consecutive days during the rainy season. Seasonal wetlands are dominated by non-native generalist species able to tolerate seasonally wet conditions such as Italian ryegrass and Mediterranean barley (*Hordeum marinum* ssp. *gussoneanum*), though native species such as cocklebur (*Xanthium strumarium*), rushes such as common bog rush (*Juncus effusus*) and valley sedge are sometimes present.

### *Seasonal Wetland Ditch*

Approximately 51,538 linear feet of ditch/canal comprising approximately 12.72 acres are located within the Study Area. Ditches/canals are man-made channels that have been excavated for the purpose of conveying water. At the time of the WRA site visit, the majority of the ditches/canals were wet and supported wetland species along the edges including tule (*Schoenoplectus acutus* var. *occidentalis*) and broadleaf cattail (*Typha latifolia*). In some areas of the canals, soils are thin and rocky with cobbles.

### *Vernal Pool*

Vernal pool habitat composes approximately 2.15 acres of the Study Area. Vernal pools are shallow, seasonally inundated depressional wetlands that form in soils with a

subsurface layer that restricts the downward flow of water. Similar to seasonal wetlands, vernal pools occur in naturally occurring and anthropogenic depressions throughout the Study Area. However, vernal pools are a specific type of seasonal wetland and are characterized by a suite of species restricted to or indicative of vernal pools. These are mostly native species, such as vernal pool goldfields (*Lasthenia fremontii*), Great Valley button celery (*Eryngium castrense*), woolly heads (*Psilocarphus brevissimus*), and Sacramento mint (*Pogogyne zizyphoroides*).

Vernal pools typically provide habitat for a variety of invertebrate species, including species that are wholly aquatic and others that are aquatic primarily during larval stages. They are used for breeding and foraging by common amphibian species such as Sierran chorus frog (*Pseudacris sierra*). Additionally, inundated vernal pools often provide important foraging and resting habitat for waterfowl and shorebirds. No special-status wildlife species were observed within vernal pools on the property during the site visits, although the pools were only visually examined and no protocol-level surveys were completed. Special-status wildlife with the potential to occur in the site's vernal pools include western spadefoot (*Spea hammondi*), for aquatic breeding, and vernal pool branchiopods (fairy and tadpole shrimps), some of which are listed under ESA.

#### *Vernal Swale*

Vernal swales compose approximately 156.92 acres of the Study Area and occur as dendritic networks of generally narrow, roughly linear depressions that convey channelized flow during the wet season. These vernal wetlands are an important component of the larger vernal pool complex and act as swales, which often provide hydrologic connections between multiple vernal pools. These wetlands are highly variable in plant composition, depending on the frequency and duration of inundation and/or saturation, as well as average flow velocities. For example, larger swales with higher flow velocities typically have large areas of bare bedrock and very sparse vegetative cover (~5%), while smaller swales typically have deeper soils (still less than 5 inches in depth) and higher vegetative cover. Compared to vernal pools, vernal swales are typically more sparsely vegetated due to the presence of channelized flow and are dominated by a mix of generalist hydrophytic species, rather than the suite of vernal pool endemics that typically dominate vernal pools in the Study Area. These features are typically sparsely vegetated with hydrophytic grasses and forbs such as barley, Italian ryegrass, coyote thistle, and vernal pool goldfields. Vegetation composition is likely seasonally variable with upland species encroaching more into swale features during the dry season. Dominant vegetation within the riverine seasonal wetlands includes Italian ryegrass, spikerush, and Mediterranean barley.

In terms of providing habitat for wildlife, vernal swales are broadly similar to vernal pools, although periods of average continuous inundation are often shorter, and thus both species diversity and overall utilization may be lower. Swales may also provide hydrologic connectivity between vernal pools and other seasonal water features, facilitating the dispersal and movement of aquatic organisms. Within the Study Area, vernal swales that are inundated for relatively long periods and/or hold larger water volumes may be occupied by western spadefoot and vernal pool branchiopods.

### *Willow Scrub Wetland*

Within the Study Area, willow scrub wetlands intergrade with seasonal wetlands and freshwater marsh. Willow scrub wetlands are characterized by a dense overstory of willows with an understory of emergent vegetation or bare ground. These wetlands comprise 6.88 acres of the Study Area.

## **4.3 Special-Status Species**

### 4.3.1 Plants

Based upon a review of the resources and databases given in Section 3.2.1, 27 statewide special-status plant species have been documented in the vicinity of the Study Area. The potential for each of these species to occur within the Study Area is summarized in Appendix C. Occurrences of special-status plants in the CNDDDB within 5 miles of the Study Area are shown in Figure 4. The Study Area has a moderate or high potential to support 23 of these species.

Two special-status plants were observed during the site assessment, and 21 other special-status plant species have a high or moderate potential to occur within the Study Area. The remaining special-status plant species found in the review of background literature were determined to have no potential or to be unlikely to occur within the Study Area, based on a lack of suitable habitat elements (e.g., soil type) and/or the elevation of the Study Area.

Special-status plants that were observed within the Study Area or have the potential to occur there are discussed in detail below.

#### *Present*

Hogwallow starfish (*Hesperervax caulescens*). Rank 4.2. Present. Hogwallow starfish is an annual forb in the sunflower family that blooms from March to June. It typically occurs in mesic, clay soils in valley and foothill grassland and shallow, sometimes alkaline vernal pool habitats at elevations ranging from 0 to 1,660 feet (0 to 500 meters) (CNPS 2016a). This species is an obligate wetland plant (Lichvar et al. 2016) and is regularly known from vernal pool habitat in some regions, but may occur in other wetland habitat types in other regions (Keeler-Wolf et al. 1998).

Hogwallow starfish was observed in annual grassland habitat and on the edges of vernal pool and seasonal wetland habitats on fine-textured substrates in the Study Area.

Shield-bracted monkeyflower (*Mimulus glaucescens*). Rank 4.3. Present. Shield-bracted monkeyflower is an annual herb found on serpentine seeps, and sometimes on streambanks, in chaparral, cismontane woodland, lower montane coniferous forest, and valley and foothill grassland from 197 to 4,068 feet (CNPS 2018b). The blooming period for this species is from February through September (CNPS 2018b). This species was

observed along the banks of the Deer Creek; seasonal wetlands and drainages (perennial and intermittent) within the Study Area also provide habitat for this species.

*Potential to Occur*

Hairy Orcutt grass (*Orcuttia pilosa*). Federal Endangered, State Endangered, Rank 1B.1. High Potential. Hairy Orcutt grass is an annual grass in the Poaceae family that blooms from May to September. This species is found in vernal pools at elevations from 150 to 655 feet (CNPS 2016b). Observed associated species include Hoover's spurge, swamp grass (*Crypsis schoenoides*), awnless spiralgrass (*Tuctoria greenei*), alkali weed (*Cressa truxillensis*), saltgrass (*Distichlis spicata*), alkali heath (*Frankenia salina*), and coyote thistle.

This species is known from 16 USGS 7.5-minute quadrangles in Butte, Glenn, Madera, Merced, Stanislaus, and Tehama counties. This species has been documented in the large vernal pool complex known as "Leininger Lakes" in the northern portion of the Study Area (CDFW 2018).

Ahart's paronychia (*Paronychia ahartii*). Rank 1B.1. High Potential. Ahart's paronychia is an annual herb in the Caryophyllaceae family that blooms from February to June. This species is found in vernal pools in cismontane woodland and valley and foothill grassland communities, at elevations from 100 to 1,670 feet (CNPS 2016b). Observed associated species include Fremont's tidy tips, California goldfields, California plantain (*Plantago erecta*), Tehama navaretia, white brodiaea (*Triteleia hyacinthina*), and annual hairgrass.

This species is known from 21 USGS 7.5-minute quadrangles in Butte, Shasta, and Tehama counties. Vernal pools in the Study Area provide suitable habitat for this species, and this species has been documented in the large vernal pool complex known as "Leininger Lakes" in the northern portion of the Study Area (CDFW 2018).

Greene's tuctoria (*Tuctoria greenei*). FE, SR, Rank 1B.1. High Potential. Greene's tuctoria is an annual herb in the Poaceae family that blooms from May to July. This species is found in vernal pools at elevations from 100 to 3,510 feet. This species has been documented in the Vina and Richard Springs NW quads. Vernal pools in the Study Area provide suitable habitat for this species. This species has been documented in the large vernal pool complex known as "Leininger Lakes" in the northern portion of the Study Area (CDFW 2018).

Henderson's bent grass (*Agrostis hendersonii*). Rank 3.2. Moderate Potential. Henderson's bent grass is an annual in the Poaceae family that blooms from April to June. This species is found in vernal pools, freshwater wetlands, and wetland-riparian areas. Vernal pools within the Study Area have the potential to support this species.

Depauperate milk-vetch (*Astragalus pauperculus*) Rank 4.3. Moderate Potential.

Depauperate milk-vetch is an annual herb in the Fabaceae family that blooms from March to June. It typically occurs in vernal mesic areas within chaparral, cismontane woodland, or valley and foothill grassland communities, often on thin soils of volcanic origin, and at elevations ranging from approximately 200 to 3,990 feet (CNPS 2016b).

This species is known from 26 USGS 7.5-minute quadrangles in Butte, Placer, Shasta, Tehama, and Yuba counties. Depauperate milk-vetch was considered to have a moderate potential to occur in vernal mesic grassland with stony, volcanically-derived soils in the Study Area. However, this species was not observed in the Study Area during the April or July 2016 surveys.

Silky cryptantha (*Cryptantha crinita*). Rank 1B.2. High Potential. Silky cryptantha is an annual herb in the Boraginaceae family that blooms from March to June. This species typically occurs on rocky volcanic soils, gravelly streambanks, gravel bars, and foothill wetlands at elevations from 270 to 3,360 feet. Vernal pools and seasonal wetland habitats within the Study Area have high potential to support this species.

Dwarf downingia (*Downingia pusilla*). Rank 2B.2. Moderate Potential. Dwarf downingia is an annual forb in the harebell family (Campanulaceae) that blooms from March to May. It typically occurs on slightly acidic clay to clay loam mesic areas on the edge of pools and lakes in valley and foothill grassland and vernal pool habitat at elevations ranging from 3 to 1,450 feet (1 to 440 meters) (CDFW 2018b). This species is an obligate wetland plant (Lichvar et al. 2016) and is regularly known from vernal pool habitat, but may occur in other wetland habitat types (Keeler- Wolf et al. 1998).

Dwarf downingia has a moderate potential to occur in the Project Area due to the presence of seasonal wetland and vernal pool habitats, and the presence of associated species.

Hoover's spurge (*Euphorbia hooveri*). Federal Threatened, Rank 1B.2. Presumed Present.

Hoover's spurge is an annual herb in the Euphorbiaceae family that blooms from July to September. This species is found in vernal pools at elevations ranging from approximately 80 to 820 feet (CNPS 2016b). Observed associated species include coyote thistle (*Eryngium vaseyi*), barley (*Hordeum marinum*), annual hairgrass (*Deschampsia danthonioides*), white headed navarretia (*Navarretia leucocephala*), Tehama navarretia (*N. heterandra*), stalked popcornflower (*Plagiobothrys stipitatus*), Downingia (*Downingia* sp.), hairy waterclover (*Marsilea vestita*), and woolly marbles (*Psilocarphus brevissimus*).

This species is known from 11 USGS 7.5-minute quadrangles in Butte, Colusa, Glenn, Merced, Stanislaus, Tehama, and Tulare counties. Vernal pools in the Study Area could provide suitable habitat for this species. This species is documented to occur within vernal pools in the "Leininger Lakes" in the northern portion of the Study Area (CDFW 2018).

Stony Creek spurge (*Euphorbia ocellata* ssp. *rattanii*). Rank 1B.2. High Potential. Stony creek spurge is an annual herb in the Euphorbia family that blooms from May to October. Typical habitat for this species include chaparral, riparian scrub (streambanks), and

valley and foothill grassland.

The Study Area contains potentially suitable riparian scrub, and valley and foothill grassland underlain by rocky soils. Additionally, the nearest documented occurrence is approximately 6 miles west-southwest (WSW) of the Study Area (CDFW 2018).

Adobe-lily (*Fritillaria pluriflora*). Rank 1B.2. High Potential. Adobe lily is a perennial bulb that blooms from February to April at elevations below 2,700 feet. Habitat typically consists of adobe or serpentine of interior foothills. The Study Area contains potentially suitable clay soils known to support this species and this species is reported from within the Study Area approximately 200 yards east of Highway 99E and 100 yards north of deer creek (CDFW 2018).

Boggs Lake hedge-hyssop (*Gratiola heterosepala*). State Endangered, Rank 1B.2. High Potential. Boggs Lake hedge hyssop is an annual forb in the plantain family (Plantaginaceae) that blooms from April to August. It typically occurs on clay soils in pools, depressions, and lake margins within freshwater marsh and swamp, and vernal pool habitat at elevations ranging from 30 to 7,720 feet (10 to 2,375 meters; CDFW 2018b, CNPS 2018a). This species is an obligate wetland plant (Lichvar et al. 2016) and is restricted to vernal pool habitat (Keeler-Wolf et al. 1998). Observed associated species include coyote thistle (*Eryngium vaseyi*), common vernal pool allocarya, horned downingia (*Downingia ornatissima*), dwarf downingia, bristled downingia (*D. bicornuta*), longstalk water-starwort (*Callitriche longipedunculata*), whitehead navarretia (*Navarretia leucocephala*), vernal pool goldfields (*Lasthenia fremontii*), and common hedge hyssop (CDFW 2016b). Boggs Lake hedge-hyssop has a moderate potential to occur in the Study Area due to the presence of seasonal wetland and vernal pool habitats, and the presence of associated species.

Coulter's goldfields (*Lasthenia glabrata* ssp. *coulteri*). Rank 1B.1 High Potential. Coulter's goldfields is an annual herb in the Asteraceae that blooms from February to June. Typical habitat includes marshes, playas and vernal pools. The Study Area contains potentially suitable vernal pools and mesic grasslands which could support this species. Additionally, this species is documented from less than 5 miles southeast of the Study Area on the Vina Plains Preserve (CDFW 2018).

Legenere (*Legenere limosa*). Rank 1B.1. Moderate Potential. Legenere is annual forb in the harebell family (Campanulaceae) that blooms from April to June. It typically occurs in the lower portions of vernal pool habitat at elevations ranging from 0 to 2890 feet (0 to 880 meters) (CDFW 2016b, CNPS 2016a). This species is an obligate wetland plant (Lichvar et al. 2016) and is restricted to vernal pool habitat (Keeler-Wolf et al. 1998). Observed associated species include needle spikerush (*Eleocharis acicularis*), water chickweed (*Montia fontana*), goldfields (*Lasthenia* spp.), meadowfoams (*Limnanthes* spp.), and non-native annual grasses (CDFW 2016b). Legenere has moderate potential to occur within the seasonal wetland and vernal pool habitats within the Study Area.

Butte County meadowfoam (*Limnanthes floccosa* ssp. *californica*). Federal Endangered, State Endangered, Rank 1B.1. Moderate Potential. Butte County meadowfoam is an annual herb in the Limnanthaceae family that blooms from March to May. This species is found in

vernal pools and vernal mesic areas in valley and foothill grassland communities, at elevations ranging from approximately 150 to 3,050 feet (CNPS 2016b). Observed associated species include peppergrass, vernal pool goldfields, big heron bill (*Erodium botrys*), common stickseed (*Blennosperma nanum*), stalked popcorn flower, Fremont's tidy tips (*Layia fremontii*), butter 'n' eggs (*Triphysaria eriantha*), soft blow wives (*Achyraea mollis*), common meadowfoam (*Limnanthes douglasii*), typical white meadowfoam (*L. alba* ssp. *alba*), woolly meadowfoam (*L. floccosa* ssp. *floccosa*), California goldfields (*Lasthenia californica* ssp. *californica*), pacific foxtail (*Alopecurus saccatus*), Italian ryegrass, and barley.

This species is known from six USGS 7.5-minute quadrangles in Butte county CNPS (2016b) and occurs approximately 6 miles south of the Study Area. Suitable vernal pool habitats occur within the Study Area.

Woolly meadowfoam (*Limnanthes floccosa* ssp. *floccosa*). Rank 4.2. High Potential.

Woolly meadowfoam is an annual herb in the Limnanthaceae family that blooms from March to May. This species is found in vernal pools and vernal mesic areas in chaparral, cismontane woodland, and valley and foothill grassland communities, at elevations ranging from approximately 200 to 4,380 feet (CNPS 2016b). Observed associated species include Butte County meadowfoam, padre's shooting star (*Primula clevelandii*), butter 'n' eggs, rusty popcorn flower (*Plagiobothrys nothofulvus*), cowbag clover (*Trifolium depauperatum*), and Fremont's tidy tips.

This species is known from 39 USGS 7.5-minute quadrangles in Butte, Lake, Lassen, Napa, Shasta, Siskiyou, Tehama, and Trinity counties. There are five reported occurrences of this species in the vicinity of the Study Area (CDFW 2018). Woolly meadowfoam was considered to have a high potential to occur in vernal pools and vernal mesic grassland in the Study Area.

Tehama navarretia (*Navarretia heterandra*). Rank 4.3. High Potential.

Tehama navarretia is an annual herb in the Polemoniaceae family that blooms from April to June. This species is found in vernal pools in valley and foothill grassland communities, at elevations ranging from approximately 100 to 3,310 feet (CNPS 2016b). This species is known from 17 USGS 7.5-minute quadrangles in Butte, Colusa, Lake, Napa, Shasta, Tehama, Trinity, and Yuba counties. Tehama navarretia was considered to have a high potential to occur in vernal pools and vernal mesic grasslands in the Study Area.

Baker's navarretia (*Navarretia leucocephala* ssp. *bakeri*). Rank 1B.1 Moderate Potential.

Baker's navarretia is an annual herb in the Polemoniaceae that blooms from April to July. Habitat for this species includes cismontane woodland, lower montane coniferous forest, meadows and seeps, and valley and foothills grassland. The Study Area contains potentially suitable vernal pool, and mesic grassland habitats which could support this species. The non-rare *N. l.* ssp. *leucocephala* was observed in vernal pools in the Study Area.

Adobe navarretia (*Navarretia nigelliformis* ssp. *nigelliformis*). Rank 4.2. Moderate Potential.

Adobe navarretia is an annual herb in the Polemoniaceae that blooms from April to July. Habitat for this species includes valley and foothill grassland and vernal pools. The Study Area contains potentially suitable vernal pools and mesic grassland

habitats underlain by clay soils which could support this species.

Slender Orcutt grass (*Orcuttia tenuis*). FT, SE, Rank 1B.1. Moderate Potential. Slender Orcutt grass is an annual in the Poaceae that blooms from May to September. Habitat includes vernal pools at elevation from 110 to 5775 feet. The Study Area contains potentially suitable vernal pool habitat and this species is documented from less than 5 miles southeast on the Vina Plains Preserve (CDFW 2018).

Bidwell's knotweed (*Polygonum bidwelliae*). Rank 4.3. High Potential. Bidwell's knotweed is an annual herb in the Polygonaceae family that blooms from April to July. This species is found in volcanic soils in chaparral, cismontane woodland, and valley and foothill grassland communities, at elevations from approximately 200 to 3,940 feet (CNPS 2016b).

This species is known from 17 USGS 7.5-minute quadrangles in Butte, Shasta, and Tehama counties. Bidwell's knotweed was considered to have a high potential to occur in grasslands in the Study Area.

Sanford's arrowhead (*Sagittaria sanfordii*). Rank 1B.2. High Potential. Sanford's arrowhead is an aquatic rhizomatous perennial forb in the water-plantain family (Alismataceae) that blooms from May to October. It typically occurs in standing or slow-moving freshwater ponds, lakes, marshes, and ditches in marsh and swamp habitat at elevations ranging from 0 to 2130 feet (0 to 650 feet) (CDFW 2016b, CNPS 2016a). This species is an obligate wetland plant (Lichvar et al. 2016) and is known from vernal pools and other wetlands in one region, but not vernal pools in others regions (Keeler-Wolf et al. 1998).

#### 4.3.2 Wildlife

Forty-five species of special-status wildlife species have been documented in the vicinity of the Study Area. The potential for each of these species to occur within the Study Area is summarized in Appendix C. Occurrences of special-status wildlife in the CNDDDB within 5 miles of the Study Area are shown in Figure 5.

Six special-status wildlife species were observed in the Study Area during the site assessment, and five other special-status wildlife species are considered present based on available literature. Additionally, 15 species have a moderate or high potential occur within the Study Area. The remaining special-status wildlife species found in the review of background literature were determined to have no potential or to be unlikely to occur within the Study Area, based primarily on a lack of suitable habitat elements and/or apparent local extirpation.

Special-status wildlife that were observed within the Study Area (or otherwise considered present there) and those that have the potential to occur within the Study Area discussed in detail below.

*Present*

Tricolored blackbird (*Agelaius tricolor*). State Threatened, CDFW Species of Special Concern, USFWS Bird of Conservation Concern. Present. The tricolored blackbird, recently listed under CESA in April 2018, is a locally common resident in the Central Valley and along coastal California. Most tricolored blackbirds reside in the Central Valley March through August, then move into the Sacramento-San Joaquin Delta, coastal locations, or the eastern foothills during winter (Meese et al. 2014). This species breeds adjacent to fresh water, preferring emergent wetlands with tall, dense vegetation (e.g., cattails, tules), thickets of willow or blackberry, and/or tall herbs. Flooded agricultural fields with dense vegetation are also used (Shuford and Gardali 2008). This species is highly colonial; nesting habitat must be large enough to support a minimum of 30 pairs, and colonies are commonly substantially larger (thousands of pairs). The tricolored blackbird often intermingles with other blackbird species during the non-breeding season. Insects are the primary prey; individuals may forage up to approximately 6 miles from their colonies, though in most cases only a small part of the area within this range provides suitable foraging (Hamilton and Meese 2006).

Tricolored blackbirds were observed at two locations within the Study Area during WRA's site visits (Figure 3). On April 4, at least two males were singing within an area of freshwater marsh adjacent to the Deer Creek mainstem (also present were several singing male red-winged blackbirds [*A. phoeniceus*]). On April 5, a group of approximately eight tricolored males were singing from a blackberry bramble along an intermittent stream in the north-central portion of the Study Area; female tricolored will also observed at this location. No clear indication of active nesting was observed, but vegetative substrates at these and several other locations within the Study Area are suitable for such. There are two nesting occurrence for this species within 1.5 miles in CNDDDB (CDFW 2018).

Great blue heron (*Ardea herodias*). No status; nesting sites (rookeries) monitored by CDFW. Present (nesting observed). The great blue heron is present year-round in California and often occurs commonly in association with a variety of aquatic habitats. Nesting occurs colonially or semi-colonially, most typically in trees and often with other heron species; nesting may also occur on man-made structures, in shrubbery, or on the ground in predator-free areas (Vennesland and Butler 2011). Nests sites usually located near water bodies where abundant forage is present. Herons prey primarily on fishes and aquatic invertebrates but utilize a variety of prey resources including smaller terrestrial vertebrates.

A small nesting colony (rookery) of great blue herons was observed by WRA during the site visit. The colony was along Deer Creek in the immediate vicinity of SVRIC Diversion Dam, and featured six active nests in one tree. This species may forage throughout the Study Area, primarily within and near Deer Creek but also opportunistically in uplands.

Oak titmouse (*Baeolophus inornatus*), USFWS Bird of Conservation Concern. Present. This relatively common species is year-round resident throughout much of California

including most of the coastal slope, the Central Valley and the western Sierra Nevada foothills. Its primary habitat is woodland dominated by oaks. Local populations have adapted to woodlands of pines and/or junipers in some areas. The oak titmouse nests in tree cavities, usually natural cavities or those excavated by woodpeckers, though they may partially excavate their own (Cicero 2000). Seeds and arboreal invertebrates make up the birds' diet. The Study Area provides oak and riparian woodland that provides suitable year-round habitat for this species, and individuals were observed at several locations there.

Northern harrier (*Circus cyaneus*). CDFW Species of Special Concern. Present. The northern harrier occurs as a resident and winter visitor in open habitats throughout most of California, including freshwater and brackish marshes, grasslands and fields, agricultural areas, and deserts. Harriers typically nest in treeless areas within patches of dense, relatively tall, vegetation, the composition of which is highly variable; nests are placed on the ground and often located near water or within wetlands (Shuford and Gardali 2008). Harriers are birds of prey and subsist on a variety of small mammals and other vertebrates.

One northern harrier was observed foraging over grassland north of Deer Creek during WRA's site visit. Open and relatively undisturbed portions of the Study Area, e.g., grasslands, including mesic areas with wetlands, provide suitable nesting habitat. This species is generally unlikely to nest in close proximity to woodland and development.

Nuttall's woodpecker (*Picoides nuttallii*). USFWS Bird of Conservation Concern. Present. Nuttall's Woodpecker, common in much of its range, is a year-round resident throughout most of California west of the Sierra Nevada. Typical habitat is oak or mixed woodland, and riparian areas (Lowther 2000). Nesting occurs in tree cavities, principally those of oaks and larger riparian trees. This species forages on a variety of arboreal invertebrates. Trees within the Study Area are of sufficient age and complex structure to support small cavities, which may be used for nesting by the species. The Study Area provides oak and riparian woodland that provides suitable year-round habitat for this species, and individuals were observed at several locations there.

Western pond turtle (*Actinemys marmorata*). CDFW Species of Special Concern. Present. The western pond turtle is the only freshwater aquatic turtle native to the majority of California, and is associated with rivers, streams, lakes, and ponds throughout much of the state. Typical aquatic habitat features include stagnant or low gradient water, aquatic vegetation, and aerial basking sites such as logs, rocks, and mud-banks. Adult females excavate nests in riparian and upland areas in the spring or early summer. Nest sites are generally located on unshaded slopes and require friable soil which is sufficiently dry to promote successful egg development; depending on latitude, young may hatch and emerge in the fall or overwinter in the nest (Thomson et al. 2016). Pond turtles may regularly utilize terrestrial habitats under some ecological conditions, including dispersing between aquatic features. This species is a dietary generalist, subsisting principally on invertebrates as well as plant material and carrion.

There is a CNDDDB record for this species within the Study Area, specifically within Deer Creek in 2016 (CDFW 2018). Additionally, WRA observed two adults within a patch of

freshwater marsh (occurring in association with Deer Creek) during the site visit (Figure 3); upland areas adjacent to the fresh featured friable soil and otherwise appeared suitable for pond turtle nesting. This species presumably has the potential to occur throughout Deer Creek and directly associated sloughs and backwaters within the Study Area, as well as longer-lasting seasonal water features (e.g., vernal pools). Pond turtles may also move overland between aquatic habitat areas within the Study Area.

Pacific lamprey (*Entosphenus tridentatus*). CDFW Species of Special Concern. Present.

This anadromous lamprey is found along the entire California coast north of San Luis Obispo County. With the exception of land-locked populations, Pacific lampreys spends the predatory phase of their lives the ocean, feeding off the bodily fluids of a variety of fish. This species is usually concentrated near the mouths of their spawning streams because its prey is most abundant in coastal areas (Moyle 2002). Adults move up into spawning streams between early March and late June. After hatching, ammocetes (lamprey larvae) are washed downstream, where they burrow into soft substrates and filter feed. Five to seven years later, ammocetes undergo metamorphosis into the predatory phase of their life cycle, and out-migrate to the ocean as adults. This species is declining throughout much of its range. As per CDFW (2017), Deer Creek supports a Pacific lamprey population; at a minimum, the mainstem within the Study Area is used for in- and out-migration.

Steelhead - Central Valley DPS. Federal Threatened. Present. Steelhead are essentially native rainbow trout that are anadromous, i.e., are born and spawn in freshwater but spend most of their life cycle in the ocean. The Central Valley Distinct Population Segment (DPS) includes all naturally spawned populations (and their progeny) in the Sacramento and San Joaquin Rivers and their tributaries, excluding San Francisco and San Pablo Bays and their tributaries. Preferred spawning habitat for steelhead is in perennial streams with cool to cold water temperatures, high dissolved oxygen levels, and fast-flowing water. During the winter or early spring the spawning fish reach suitable stream riffles (shallow areas with gravel or cobble substrate) in the upper sections of streams and dig their redds (depressions used for egg laying) in the substrate. Abundant riffle areas for spawning and deeper pools with sufficient riparian cover for rearing are necessary for successful breeding. Unlike other Pacific salmonids, steelhead do not always die after spawning, though it is rare for an individual to spawn more than twice (Moyle 2002).

Deer Creek supports a steelhead population (CDFW 2017). Within the Study Area, lower Deer Creek is used for steelhead in- and out-migration. Spawning typically occurs in the upper reaches of streams, and thus is unlikely to occur within the Study Area.

Chinook salmon - Central Valley spring-run ESU. Federal Threatened, State Threatened. Present. The Central Valley spring-run Evolutionary Significant Unit (ESU) of Chinook salmon includes all naturally spawned spring-run populations from the Sacramento and San Joaquin River mainstems and their tributaries. Chinook salmon are anadromous; adults migrate from the marine environment into their natal freshwater streams and rivers, spawning just once before they die. Spring-run chinook salmon enter the Sacramento River between February and June, subsequently moving upstream to

enter tributary streams from February through July, peaking in May-June. These fish migrate into the headwaters and hold in pools until they spawn from mid- August to mid-October, peaking in September. Spawning salmon are generally faithful to their natal streams, using visual and chemical cues to locate these waters. While migrating and holding in streams, spring-run Chinook salmon do not feed, relying instead on stored body fat reserves for maintenance and gonadal maturation. Eggs are laid in large redds hollowed out in gravel beds. Some fish remain in the stream until the following October and emigrate as "yearlings"; large pools with cold water are essential over-summering habitat.

Deer Creek is one of only three streams that supports a wild, self-sustaining population of this Chinook salmon ESU (CDFW 2017). Within the Study Area, lower Deer Creek is used for in- and out-migration.

Chinook salmon - Central Valley fall/late fall-run ESU. CDFW Species of Special Concern. Present. The Central Valley fall/late fall-run ESU of Chinook salmon includes all naturally spawned spring-run populations from the Sacramento and San Joaquin River mainstems and their tributaries. Late-fall run Chinook salmon are large in size and morphologically similar to spring-run Chinook. The great majority appear to spawn in the mainstem of the Sacramento River, which is entered from October through February. Spawning occurs in January, February and March, although it may extend into April in some years. Typical of the species, eggs are laid in large redds hollowed out in gravel beds. All fry (hatchling fish) have emerged by early June, and juveniles hold in the river for nearly a year before moving out to sea the following December through March. Specific habitat requirements for this ESU have not been determined, but are presumably similar to other Chinook salmon runs within the region.

Deer Creek supports a population of this Chinook salmon ESU (CDFW 2017). As with the spring- run ESU, lower Deer Creek within the Study Area is used for in- and out-migration.

Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*). Federal Threatened. Present. The valley elderberry longhorn beetle (VELB) was listed in 1980. It is found throughout much of the Central Valley in elderberry (*Sambucus* sp.) shrubs, on which it is completely dependent for larval development, and to a lesser degree, adult feeding. Typical habitat is characterized as large stands of mature elderberry shrubs in riparian or floodplain areas, with a variety of other riparian-affiliated trees and shrubs also present in the canopy.

There is a CNDDDB occurrence of this species along Deer Creek within the Study Area, specifically in the immediate vicinity of the Highway 99 bridge and dating from 2008 (CDFW 2008). Elderberry shrubs are relatively common within the Study Area's riparian habitats and adjacent areas, and many are large enough to support VELB.

*Potential to Occur*

Pallid bat (*Antrozous pallidus*). CDFW Species of Special Concern, WBWG High Priority. High Potential. The pallid bat is broadly distributed throughout much of western

North America and typically occurs in association with open, rocky areas. Occupied habitats are variable and range from deserts to forests in lowland areas, and include higher-elevation forests. Roosting may occur singly or in groups of up to hundreds of individuals. Roosts must offer protection from high temperatures and are typically in rock crevices, mines, caves, or tree hollows; manmade structures are also used, including buildings (both vacant and occupied) and bridges. This species is highly sensitive to disturbance while roosting. Pallid bats are primarily insectivorous, feeding on large prey that is usually taken on the ground but sometimes in flight (WBWG 2018).

There are three CNDBB occurrences for this species within 10 miles of the Study Area, all located to the north and two are in affiliation with riparian trees (CDFW 2018). Within the Study Area, larger tree cavities/hollows and bridges have the potential to support roosting, including maternity roosting.

Western red bat (*Lasiurus blossevillii*). CDFW Species of Special Concern, WBWG High Priority. High Potential. This migratory species occurs throughout much of the western United States and is associated with a variety of woodland and forest types. Western red bats are typically solitary, roosting primarily in the foliage of broad-leaved trees or shrubs. Day roosts are commonly in edge habitats adjacent to streams or open fields, in orchards, and sometimes in urban areas. There appears to be an affiliation for riparian trees (particularly willows, cottonwoods, and sycamores; Pierson et al. 2006). It is believed that males and females maintain different distributions during the reproductive season, where females take advantage of warmer inland areas and males occur in cooler areas along the coast.

Similar to pallid bat, there are CNDBB occurrences for this species within 10 miles of the Study Area, most are in affiliation with riparian trees (CDFW 2018). The Study Area provides mature riparian trees including willows, cottonwoods, and sycamores, and features numerous habitat edge habitats as well as orchards. Tree foliage within the Study Area is suitable for roosting, including, maternity roosting.

Long-eared myotis (*Myotis evotis*). WBWG Medium Priority. Moderate Potential. The long-eared myotis (bat) is primarily associated with coniferous forest (from sea level to approximately 9,000 feet elevation), but also occurs in semiarid shrublands, sage scrub, chaparral, and agricultural areas. This species roosts under loose tree bark, in tree hollows, caves, mines, crevices in rocky outcrops, in buildings, under bridges and occasionally on the ground. Long-eared myotis primarily consume beetles and moths, gleaning prey from foliage, trees, rocks, and from the ground (WBWG 2018).

Similar to the previous bat species, there are CNDBB occurrences for this species within 10 miles of the Study Area, in affiliation with riparian trees as well as grassland and shrubs (CDFW 2018). Trees (e.g., hollows) and bridges within the Study Area provide potential roosts, including for maternity roosting.

Grasshopper sparrow (*Ammodramus savannarum*). CDFW Species of Special Concern. Moderate Potential. The grasshopper sparrow is a summer resident in California, breeding in open grasslands and prairie-like habitats with short- to moderate-height vegetation, and often scattered shrubs. Both perennial and annual (non-native)

grasslands are used. Nests are placed on the ground and well concealed, often adjacent to grass clumps (Shuford and Gardali 2008). Grasshopper sparrows are secretive and generally detected by voice. Insects comprise the majority of the diet. Within the Study Area, open annual grassland areas provide suitable habitat for this species.

Great egret (*Ardea alba*). No status; nesting sites (rookeries) monitored by CDFW. Moderate Potential (for nesting). The great egret is present year-round in California and occurs in association with a variety of aquatic habitats (marshes, river and streams, lakes, etc.). This species nests colonially, in a generally similar manner to great blue heron (described above); nests are usually placed in trees near water, and colonies often feature other heron/egret species. Egrets prey primarily on fishes and other aquatic organisms but also take terrestrial prey.

There is a nesting occurrence in CNDDDB for this species along Mill Creek (approximately 5.5 miles north of the Study Area); the occurrence involved great egrets nesting in association with great blue herons. Riparian trees within the Study Area provide suitable nesting habitat, as described for great blue heron below.

Burrowing owl (*Athene cunicularia*). CDFW Species of Special Concern; USFWS Bird of Conservation Concern. Moderate Potential. The burrowing owl occurs as a year-round resident and winter visitor in much of California's lowlands, inhabiting open areas with sparse or non-existent tree or shrub canopies. Typical habitat is annual or perennial grassland, although human-modified areas such as agricultural lands and airports are also used (Poulin et al. 1993). This species is dependent on burrowing mammals to provide the burrows that are characteristically used for shelter and nesting, and in northern California is typically found in close association with California ground squirrels (*Spermophilus beecheyi*). Manmade substrates such as pipes or debris piles may also be occupied in place of burrows. Prey consists of insects and small vertebrates. Breeding typically takes place from March to July in northern California.

Open grassland within the Study Area provides suitable year-round habitat for this species. The nearest breeding occurrences in CNDDDB are located a minimum distance of 10.0 miles northwest of the Study Area (CDFW 2018). Several burrowing owls have been observed in during the non-breeding season in recent years (2016-2018) along Leninger and Lassen Roads within 3.0 miles to the south of the Study Area, during the non-breeding season (eBird 2018). Ground squirrels and their burrows were observed during the site visit. Individuals of this species may occur year-round within the Study Area, or simply as winter visitors during the non-breeding season.

Swainson's hawk (*Buteo swainsoni*). State Threatened, USFWS Bird of Conservation Concern. High Potential. Swainson's hawk is a summer resident and migrant in California's Central Valley. Nesting typically occurs at the edge of narrow bands of riparian trees, in isolated patches of oak woodland, in lone trees, and in planted and natural trees associated with roads and farmyards and in adjacent urban residential areas. Foraging occurs in open areas including grasslands, open woodlands, and agricultural land. While breeding, adults feed primarily on rodents (and other vertebrates); for the remainder of the year, large insects (e.g., grasshoppers, dragonflies) comprise most of the diet. In many areas, Swainson's hawks have adapted

to foraging primarily in and around agricultural plots (particularly alfalfa, wheat and row crops), as prey is both numerous and conspicuous at harvest and/or during flooding or burning (Bechard et al. 2010).

The Study Area contains both numerous trees that are suitable for Swainson's hawk nesting as well as foraging habitat (grasslands, pastureland, etc.). The nearest documented nesting occurrence in CNDDDB is located approximately 1.2 miles northwest of the Study Area (CDFW 2018). No Swainson's hawks were observed within the Study Area during the site visit, though this observation effort was as per CDFW survey protocol, and the species has the potential to nest there in future years.

White-tailed kite (*Elanus leucurus*). CDFW Fully Protected Species. Moderate Potential. The white-tailed kite is resident in open to semi-open habitats throughout the lower elevations of California, including grasslands, savannahs, woodlands, agricultural areas and wetlands. Vegetative structure and prey availability seem to be more important habitat elements than associations with specific plants or vegetative communities (Dunk 1995). Nests are constructed mostly of twigs and placed in trees, often at habitat edges. Nest trees are highly variable in size, structure, and immediate surroundings, ranging from shrubs to trees greater than 150 feet tall (Dunk 1995). This species preys upon a variety of small mammals, as well as other vertebrates and invertebrates.

The Study Area provides typical habitat for this species, with open annual grassland areas for foraging and a variety of trees for nesting. Although not observed during the site visit, this species has been recently observed at several locations within 5 miles of the Study Area (eBird 2018).

Yellow-breasted chat (*Icteria virens*). CDFW Species of Special Concern. Moderate Potential. The yellow-breasted chat is a generally uncommon summer resident that occurs throughout most of California. It is an aberrantly large member of the wood-warbler family (*Parulidae*). Breeding habitat consists of early successional-type riparian habitats where a dense understory of thickets and tangles forms below an open canopy. Plant species typically used for nesting include blackberry, wild grape, and willows (Shuford and Gardali 2008). Though males often sing from exposed perches in trees, this species is generally secretive and difficult to observe.

Riparian woodland and thickets within the Study Area provide suitable nesting habitat for this species, and there are recent observations during the breeding season within 5 miles (eBird 2018).

Loggerhead shrike (*Lanius ludovicianus*). CDFW Species of Special Concern, USFWS Bird of Conservation Concern. Moderate Potential. The loggerhead shrike is a year-round resident and winter visitor in lowlands and foothills throughout California. This species is associated with open country with short vegetation and scattered trees, shrubs, fences, utility lines and/or other perches. Although they are songbirds, shrikes are predatory and forage on a variety of invertebrates and small vertebrates. Captured prey items are often impaled for storage purposes on suitable substrates, including thorns or spikes on vegetation, and barbed wire fences. Nests in trees and large shrubs; nests are usually placed three to ten feet off the ground (Shuford and Gardali 2008).

The Study Area provides open annual grassland and pasture areas with scattered trees and shrubs for foraging and nesting, as well as many sections of barbed-wire fencing. Although not observed during the site visit, this species has been recently observed at several locations within 5 miles of the Study Area (eBird 2018).

Yellow-billed magpie (*Pica nuttalli*). USFWS Bird of Conservation Concern. Moderate Potential. The yellow-billed magpie is endemic to California, occurring year-round in the Central Valley and associated foothills, and the central Coast Ranges. This species inhabits open park-like areas including oak savanna and woodland, the margins of stream courses, and some agricultural areas (e.g., orchards). Breeding typically occurs in loose colonies. The large, dome-shaped nests are placed high in trees, usually oaks, and often in clumps of mistletoe (Koenig and Reynolds 2009). This species is an omnivore and an opportunistic feeder.

The Study Area provides suitable year-round habitat for this species, including oak woodland, riparian groves, and orchards. Although not observed during the site visit, this species has been recently observed at several locations within 5 miles of the Study Area (eBird 2018).

Western spadefoot. CDFW Species of Special Concern. Moderate Potential. The western spadefoot (also called “spadefoot toad”) ranges throughout California’s Central Valley and adjacent foothills. Suitable habitat for this amphibian consists of open areas with sandy or gravelly soils, and includes grassland, scrubland, woodland, washes, and alluvial fans. Spadefoots spend most of the year underground in burrows and similar refugia, and often constructs their own burrows. Breeding occurs in shallow, temporary pools formed by heavy winter rains; at least four weeks of continuous inundation are required for successful larval metamorphosis.

The Study Area provides open annual grassland with friable soil and mammal burrows are also present. Additionally, seasonal water features (vernal pools and swales) that appear relatively short-lived are also present, and may be used for spadefoot breeding. There are relatively recent documented breeding occurrences of this species in CNDDDB within 6 miles to the southeast of the Study Area, in association with similar soil types to those found within the Study Area (CDFW 2018).

Conservancy fairy shrimp (*Branchinecta conservatio*). Federal Endangered. Moderate Potential. The Conservancy fairy shrimp (CFS) was listed in 1994 and is endemic to California’s Central Valley, where at least seven populations exist (USFWS 2007). CFS inhabits vernal pools and similar seasonal water features; the majority of occupied features are relatively large, turbid, cool- water vernal pools typically referred to as playa pools (Helm 1997, Eriksen and Belk 1999). Playa pools typically remain inundated much longer than most vernal pools, even though they often have maximum depths comparable to typical vernal pools. CFS have been collected from early November (when pools start to fill) to early April. Average time to maturity from hatching is forty-nine days, though it can be as little as nineteen days in warmer pools (Eriksen and Belk 1999).

There are three CNDDDB occurrences of CFS within 1.5 miles of the Study Area, the

nearest located at the “Leininiger Lakes” (larger and longer-lasting vernal pools) approximately 0.2 mile to the north of the Study Area (CDFW 2018). A small number of seasonal water features within the Study Area near the aforementioned occurrence appear to be longer-lasting vernal pools and are the most likely to support CFS within the Study Area.

Vernal pool fairy shrimp (*Branchinecta lynchi*). Federal Threatened. High Potential. The vernal pool fairy shrimp (VPFS) was listed in 1994 and is nearly endemic to California. Populations are known from Stillwater Plain in Shasta County through most of the length of the Central Valley to Pixley in Tulare County; additional disjunct populations exist at various other locations, including in the central and southern Coast Ranges. Overall, this species is widespread but generally not abundant in occupied areas. VPFS occurs primarily in vernal pools but is also found in a variety of both natural and artificial temporary wetland habitats including alkali pools, ephemeral drainages, stock ponds, vernal swales, rock outcrop pools, and even roadside ditches (Helm 1997). Occupied features are typically small (ranging from 0.1 to 0.05 acre in size), and pond for a relatively short duration (e.g., as little as 3-4 weeks; Eriksen and Belk 1999). Soil types associated with VPFS vary greatly with geography and influence the ecology of the species. Known water quality tolerances are 48 to 481 ppm for salinity, and 6.3 to 8.5 for pH (Eriksen and Belk 1999).

There are several CNDDDB occurrences of this species within 5 miles of the Study Area, the nearest of which occurs east of the “Leininiger Lakes” (larger and longer-lasting vernal pools) located approximately 0.2 mile to the north (CDFW 2018). Some vernal pools within the Study Area appear to be relatively small in area and shorter-lived, and thus provide potential habitat for VPFS. Longer-ponding vernal swales also have the potential to be occupied.

Vernal pool tadpole shrimp (*Lepidurus packardii*). Federal Endangered. Moderate Potential. The vernal pool tadpole shrimp (VPTS) was listed in 1994 and is virtually endemic to the Central Valley, with the majority of known populations occurring in the Sacramento Valley. Like other branchiopod crustaceans, VPTS inhabits pools/wetlands that dry down seasonally. Suitable habitats vary considerably and include vernal pools, clay flats, alkaline pools, ephemeral stock ponds, roadside ditches, and deeper road ruts (Rogers 2001). Occupied vernal pools may range in size from small, clear, and well-vegetated to highly turbid, alkali scald pools to large winter “lakes” (Rogers 2001). They may be seasonal or ephemeral, and may exhibit a wide range of salinity levels. However, VPTS survival requires that water bodies be deeper than five inches, pond for a minimum of 40 days, and not experience wide daily temperature fluctuations (Rogers 2001). VPTS cysts (resting eggs) must have the opportunity to dry out completely before they can hatch.

As with VPFS, there are several CNDDDB occurrences of this species within 5 miles of the Study Area, the nearest of which occurs at “Leininiger Lakes” located approximately 0.2 mile to the north (CDFW 2018). Vernal pools and other seasonal aquatic features (e.g., swales) within the Study Area may support VPTS; features that tend to have longer average inundation periods and/or deeper water are the most likely to be

occupied.

#### 4.3.3 Critical Habitat

The Deer Creek mainstem is designated critical habitat for federal listed Chinook salmon, including the portion within the Study Area (USFWS 2018). No other designated critical habitat is present within the Study Area.

## **5.0 SUMMARY AND RECOMMENDATIONS**

Thirteen sensitive biological communities were identified within the Study Area. Twenty-three special-status plant species and 25 special-status wildlife species are considered present or have a moderate or high potential to occur within the Study Area. The following sections present recommendations for future studies and/or measures to avoid or reduce impacts to these sensitive habitats and species that may result from project implementation. The extent to which these various recommendations will be germane to specific actions within the Study Area will depend on the details of each action; generally, a more conservative approach is provided to cover a wide range of potential impacts.

### **5.1 Biological Communities**

A portion of the Study Area is comprised of developed/ruderal and annual grasslands communities, which are not sensitive. However, there are 13 sensitive biological communities within the Study Area. Butte Creek, intermittent channels, and associated riparian forest and riparian wetland communities are potential jurisdictional waters of the U.S. by the Corps under Section 404 of the CWA; potential jurisdictional waters of the State by the RWQCB under Section 401 of the CWA; jurisdictional habitat by the CDFW under Section 1600-1616 of the CFGC. Wetland features, including seasonal wetlands, vernal pools, vernal swales, and freshwater marsh are considered sensitive natural communities by the CDFW, and impacts to these communities receive consideration under CEQA. Additionally, these features are potential jurisdictional wetland waters of the U.S. by the Corps under Section 404 of the CWA and potential jurisdictional wetland waters of the State by the RWQCB under Section 401 of the CWA.

A formal jurisdictional wetland delineation following Corps procedures and subsequent agency verification are recommended to determine which parts of the Study Area would be considered jurisdictional under federal and state regulations and to map their exact location and extent.

### **5.2 Special-Status Plant Species**

Of the 23 statewide special-status plant species with moderate or high potential to occur in the vicinity of the Study Area, two were observed within the Study Area: hogwallow starfish and shield-bracted monkeyflower, both of which are CNPS Rank 4 species. To determine the presence of special-status plant species within the Study Area, surveys

are recommended during the period of time when the species with moderate or high potential to occur are blooming or otherwise identifiable. Future surveys within the Study Area should cover relevant impact areas (as defined by the specifics of each action), and be targeted to the specific localized habitat types for each species with potential to occur. Additionally, limiting grazing within focal survey areas prior to the surveys will ensure that plant species are identifiable.

### **5.3 Special-Status Wildlife Species**

Of the 45 special-status wildlife species known to occur in the vicinity of the Study Area, 11 species are considered present and 15 additional species were determined to have the potential to occur there. In addition to special-status species, a variety of bird species with baseline protections under the MBTA and CFGC utilize the Study Area's varied habitats seasonally to year-round and many presumably nest there. It should be noted that many special-status wildlife species are anticipated to benefit from the proposed project, particularly salmonids and riparian-affiliated birds.

Recommendations to avoid adverse impacts to special-status wildlife and protected (non-status) birds during project implementation are outlined below.

#### 5.3.1 Swainson's Hawk

The state-listed Swainson's hawk is known to be present (seasonally) in the vicinity of the Study Area which provides suitable foraging habitat for this species (e.g., grassland), and many larger trees there are suitable for nesting. Given the listed status of this species, potential impacts include both disturbances/harm to nesting birds and impacts to foraging habitat; the former will presumably be of greater relevance to project activities within the Study Area.

#### *Nesting*

Destruction or harm to an active or otherwise attended Swainson's hawk nest would constitute a violation of CESA, and loss of a nest tree (used currently and/or in the past) may require authorization from CDFW. As such, WRA recommends the following:

- Project-related high-disturbance activities (e.g., grading, excavating) should occur from August 16 to January 31 (outside of the nesting bird season) to the extent feasible.
- If such is infeasible, WRA recommends a survey effort for nesting Swainson's hawks that covers the relevant portions of the Study Area (where work activities/disturbances are planned) and suitable nest trees within 0.25 mile of these areas. Survey protocol outlined by CDFW involves nine (9) individual surveys conducted during the greater nesting period from late March through July in a given year. It may be feasible to obtain approval from CDFW for a reduced survey effort, i.e., fewer than nine surveys and/or a shorter survey period; the likelihood and details of such are unknown.
- Any active nests found within 0.25 mile of the Study Area would require

avoidance by the project, including off-site nests via work exclusion buffers. The size of such buffers varies dependent on nest and nest tree location, the level of ambient disturbances in the area, and other factors.

- If relevant, loss of a nest tree would potentially require compensatory

mitigation.

#### *Foraging habitat*

Impacts to Swainson's hawk foraging habitat are potentially significant under CEQA, and CDFG (1994b) has provided guidance regarding compensatory mitigation for such impacts. If such is relevant to project activities proposed within the Study Area (e.g., grassland is to be converted into habitat that provides lower foraging value), the CEQA Lead Agency and/or CDFW would be responsible for the determination of the significance of loss of potential foraging habitat.

#### 5.3.2 Burrowing Owl

Burrowing owls may use the Study Area as winter visitors or be present year-round, including nesting. The following measures are recommended to avoid impacts to burrowing owl:

- If project impact areas are within or adjacent to areas of open grassland, a pre-construction burrowing owl survey effort per protocol approved by CDFW is recommended no more than 14 days prior to the initiation of ground disturbance (or other disruptive activities).
- If a survey is conducted during the greater burrowing owl breeding season (February 1 to August 31) and owls are found to be breeding within the Study Area, a suitable exclusionary buffer will be placed around the nest site (see details in section 5.3.3 below) until all offspring have fledged. Once all offspring have fledged, passive relocation should be employed (e.g., the use of one-way doors across burrow entrances) to remove owls from areas to be impacted.
- If a survey is conducted during the non-breeding season (September 1 to January 31) and this species is found to be present, passive relocation techniques as described previously should be employed, and all owls removed from areas to be impacted prior to the initiation of ground disturbance.
- If relevant, the permanent loss of occupied burrows or foraging habitat for the species may require compensatory mitigation. The details of such would be determined in coordination with CDFW, which provides guidelines (CDFG 2012).

### 5.3.3 Other Special-status and Non-status Birds

Six special-status birds have the potential to utilize and nest within the Study Area: grasshopper sparrow, oak titmouse, white-tailed kite, loggerhead shrike, yellow-billed magpie, and Nuttall's woodpecker. Additionally, a variety of other native species with baseline protections under Federal and State law also presumably nest within the Study Area. Nesting may occur on a wide variety of substrates including trees and shrubbery (including tree cavities), herbaceous/grassland vegetation, or man-made structures (buildings, bridges, utilities infrastructure). Riparian affiliated-birds are anticipated to ultimately benefit from the riparian and floodplain restoration outcomes associated with the proposed project.

The following general measures are recommended prior to the initiation of major project activities within the Study Area (vegetation removal, ground disturbance) to avoid adverse impacts to nesting birds during project implementation:

- As feasible, vegetation removal and/or initial ground disturbance should occur during the non-nesting season (August 16 to January 31). No pre-construction surveys would be required during this period.
- If initial ground disturbance and/or vegetation removal occurs during the breeding season (February 1 through August 15), a qualified biologist should conduct a breeding bird survey no more than 14 days prior to ground disturbance to determine if any birds are nesting within or adjacent to project impact areas.
- If active nests are found within project impact areas or close enough to these areas to affect breeding success, the biologist should establish an appropriate exclusion zone (buffer) around each nest within which no project-related activities are allowed. Appropriate exclusion buffer sizes vary depending upon the bird species in question, nest location, and the existing ambient disturbance regime (visual, aural, and vibratory); buffers may be as small as 50 feet (for common, disturbance-adapted species) to 250 feet or more (for special-status birds and raptors). Once all young within a nest have fledged (left the nest structure and are no longer dependent upon it), or the nest otherwise becomes inactive (e.g., due to predation), work may take place in the former exclusion zone.

### 5.3.4 Special-status Bats

Three special-status bats have the potential to roost in trees within the Study Area, including maternity roosting. To avoid impacts to roosting bats, the following measures are recommended:

- If necessary, any tree removal or trimming (including dead trees and snags) should occur outside of the general bat maternity roosting season (October 1 to March 31); pre-construction surveys are not recommended during this time.
- If tree removal/trimming must occur between during the maternity roosting period (April 1 and September 30), a bat roost habitat assessment should be conducted by a qualified biologist. The bat roost habitat assessment will determine the likelihood of the focal trees/snags supporting roosting bats at the time of removal.

If the bat roost habitat assessment identifies suitable or potentially occupied roosts, a pre-construction bat survey should be performed no more than 14 days prior to removal using site appropriate methods to determine if potential roost structures are occupied.

- If special-status bat species or maternity roosts are detected during these surveys, appropriate, species and roost-specific mitigation measures should be developed, in consultation with CDFW.
- Irrespective of time of year, all felled trees should remain on the ground for at least 24 hours prior to chipping, off-site removal, or other processing to allow any bats to escape.

#### 5.3.5 Western Pond Turtle

Western pond turtle known to be present within the Study Area, and may be expected in association with Deer Creek and an array of other aquatic features within the Study Area. Nesting may occur in a variety of upland areas, most likely those that are in close proximity to perennial waters. Floodplain restoration is anticipated to ultimately benefit this species. The following measures are recommended to avoid adverse impacts to western pond turtle:

- In-water work restrictions relevant to special-status fishes (see section 5.3.7 below) will presumably provide protections to pond turtles as well.
- Additional avoidance measures should be developed in coordination with CDFW and may include (but are not limited to) the following: pre-construction surveys, seasonal avoidance of terrestrial nesting substrates, and installation of exclusionary fence around specific impact areas.

#### 5.3.6 Western Spadefoot

Western spadefoot has the potential to be present within the Study Area, including both within terrestrial habitat (mammal burrows and similar refugia) and aquatic breeding habitat (vernal pools and other seasonal water features). The following measures are recommended to avoid adverse impacts to western spadefoot:

- Impacts (both direct and indirect) to potential habitat features (vernal pools, adjoining grassland, etc.) should be avoided to the extent feasible. If impacts are anticipated, completion of presence/absence surveys for this species in focal areas (e.g., via aquatic surveys for eggs or larvae) or simply assuming presence, are recommended for purposes of project planning.
- If spadefoots are determined to be present within project impact areas, avoidance and minimization measures will presumably be developed in coordination with CDFW. Such measures may include seasonal work limits/restrictions and/or pre-construction surveys.

### 5.3.7 Special-status Fishes

Three special-status salmonids and Pacific lamprey are present within Deer Creek and use the lower portion of the stream for in- and out-migration. Additionally, the Deer Creek mainstem is designated critical habitat for federal listed Chinook salmon. A primary goal of proposed activities within the Study Area is to improve migration habitat for anadromous salmonids, a substantial benefit to these species. The following measures are recommended for avoiding impacts to these fishes during project implementation:

- In-water work and related activities (e.g., levee construction, bank stabilization, etc.) will presumably require consultation with NMFS and CDFW.
- Activities potentially directing impacting listed fishes and their habitat within the Study Area will likely be restricted to the work window of June 15 through September 15.
- Dependent on the specifics of project activities, best management practices for NMFS- covered species are likely to be required, and may include (but are not limited to) the following: limited access points to streams/stream banks, with minimized impact to riparian trees and vegetation; a Spill Prevention and Control Plan (including regular checks of equipment for leaks and fueling only within designated areas); adequate erosion control measures and materials; and, work restrictions related to rainfall and saturated ground.

### 5.3.8 Vernal Pool Crustaceans

Three federal listed vernal pool crustaceans have the potential to be present within the Study Area. The following measures are recommended to avoid adverse impacts to these species:

- If direct or indirect impacts to habitat features (vernal pools, adjoining grassland, etc.) are anticipated, completion of protocol-level presence/absence surveys, or simply assuming presence, will presumably be necessary to proceed with project planning and (if necessary) compensatory mitigation. Protocol surveys as per the USFWS (2015) require one wet-season survey effort (for adults) and one dry-season survey (for cysts, i.e., resting eggs) within a three-year period.
- If any listed crustaceans are assumed or determined by surveys to be present and direct impacts to habitat are proposed, consultation with the USFWS would be necessary and compensatory mitigation for direct and indirect impacts to vernal pool branchiopods may be required. If no direct impacts to habitat are proposed, mitigation for indirect impacts could potentially be required through the CEQA process (if relevant).
- The USFWS may use a 250-foot buffer as a starting point for determining indirect impacts of development within the watershed of occupied habitat. Site-specific hydrologic analyses may be effective in justifying a reduced watershed buffer for occupied habitat(s).

### 5.3.9 Valley Elderberry Longhorn Beetle

VELB has been documented within the Study Area (along Deer Creek near Highway 99) and may occur in association with elderberry throughout many of the Study Area's riparian areas. The following measures are recommended to avoid adverse impacts to this species:

- All elderberry plants within the Study Area should be avoided to the fullest extent feasible, including preserving sufficient surrounding habitat to ensure their survival.
- If impacts to elderberry plants are unavoidable, a qualified biologist experienced in VELB natural history and identification (including identification of VELB sign, e.g., exit holes on elderberry stems) should survey all elderberry plants to be impacted within the Study Area using appropriate methodology to determine if this species is present.
- If VELB is determined to be present, consultation with the USFWS would be necessary, and some form of compensatory mitigation would likely be required. (If impacts to VPFS and/or VPTS are anticipated, consultation for VELB could occur concurrently with consultation for the former species.)
- To the extent feasible, future land use alterations within the Study Area should preserve and enhance existing riparian woodland areas.

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## **APPENDIX A: FIGURES**

Figure 1. Study Area Location

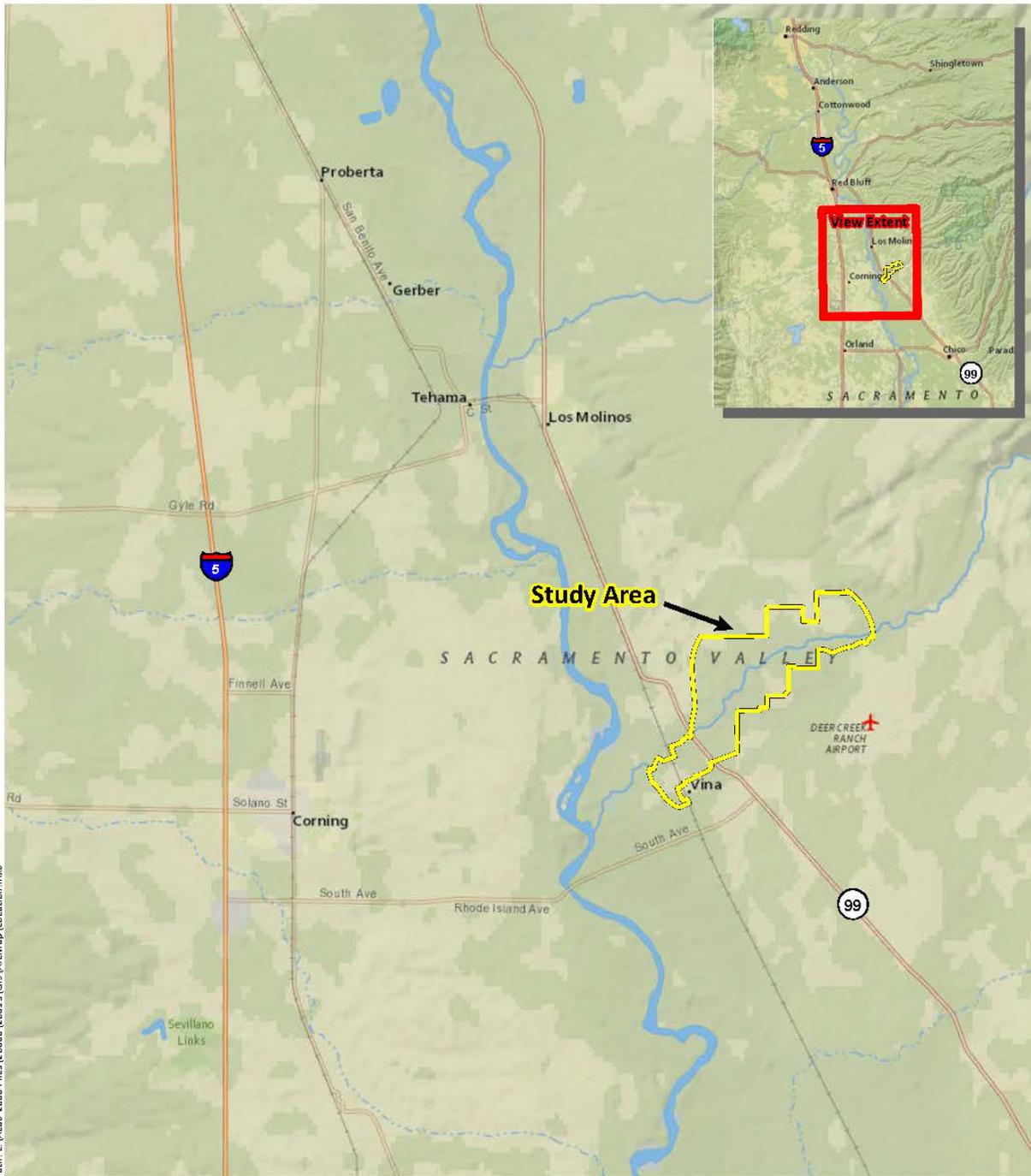
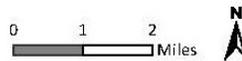
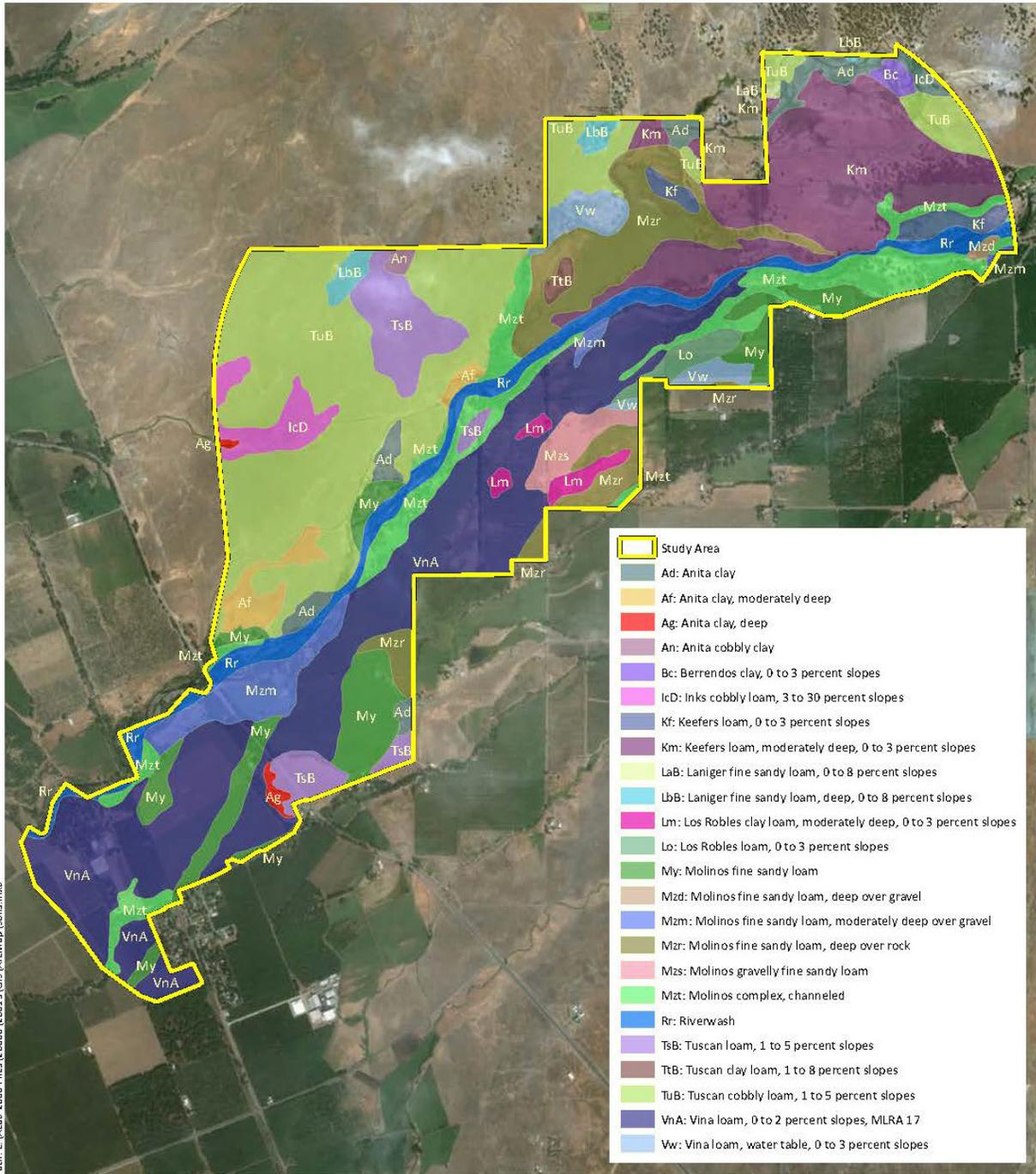


Figure 1. Study Area Location

Lower Deer Creek  
Tehama County, California



**Figure 2. Soils Mapped Within the Study Area**



Sources: 2016 DigitalGlobe Aerial, NRCS SSURGO Soils, WRA | Prepared By: mrochelle, 5/17/2018

**Figure 2. Soils Mapped Within the Study Area**

Lower Deer Creek  
Tehama County, California

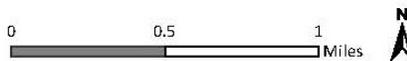
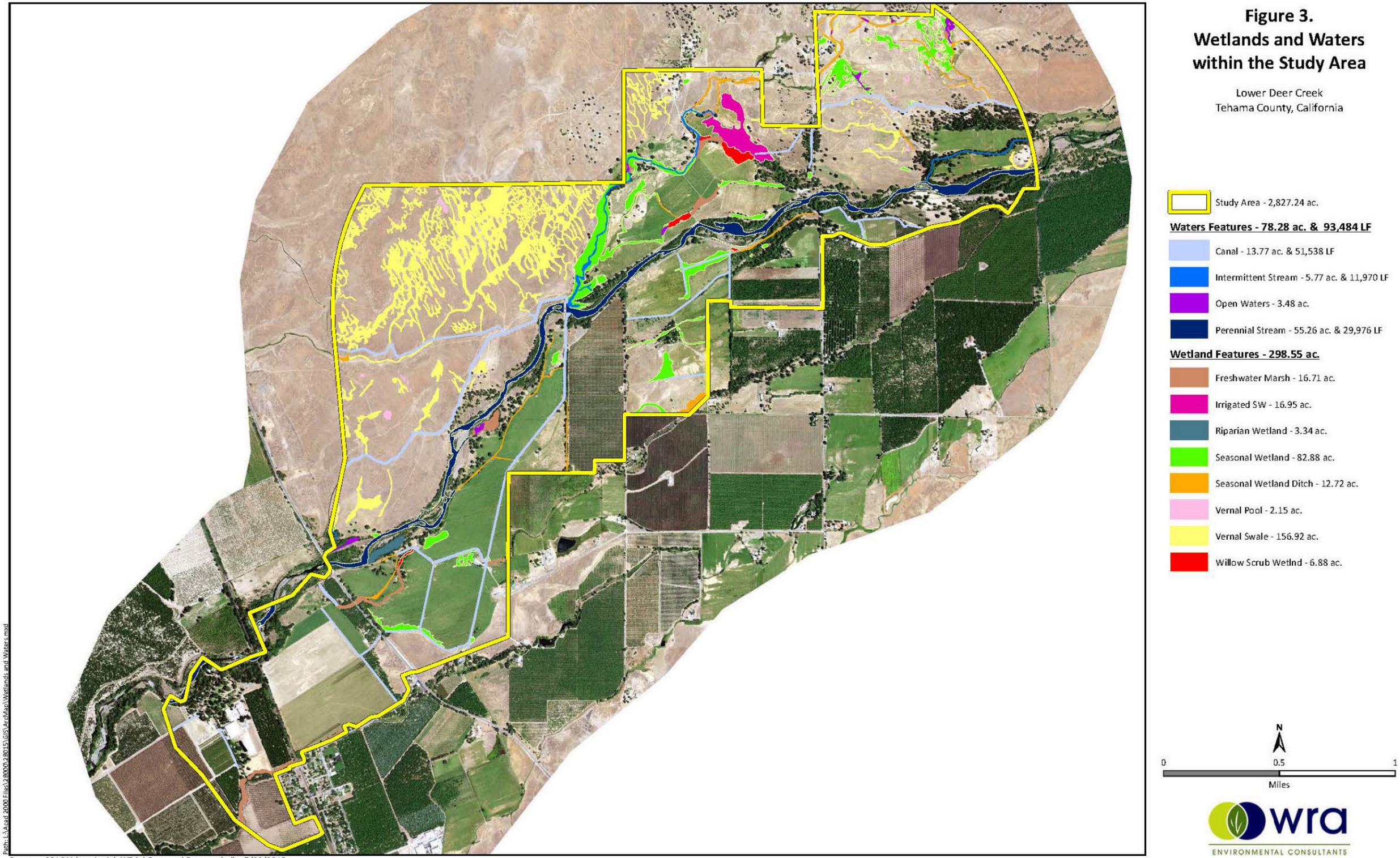


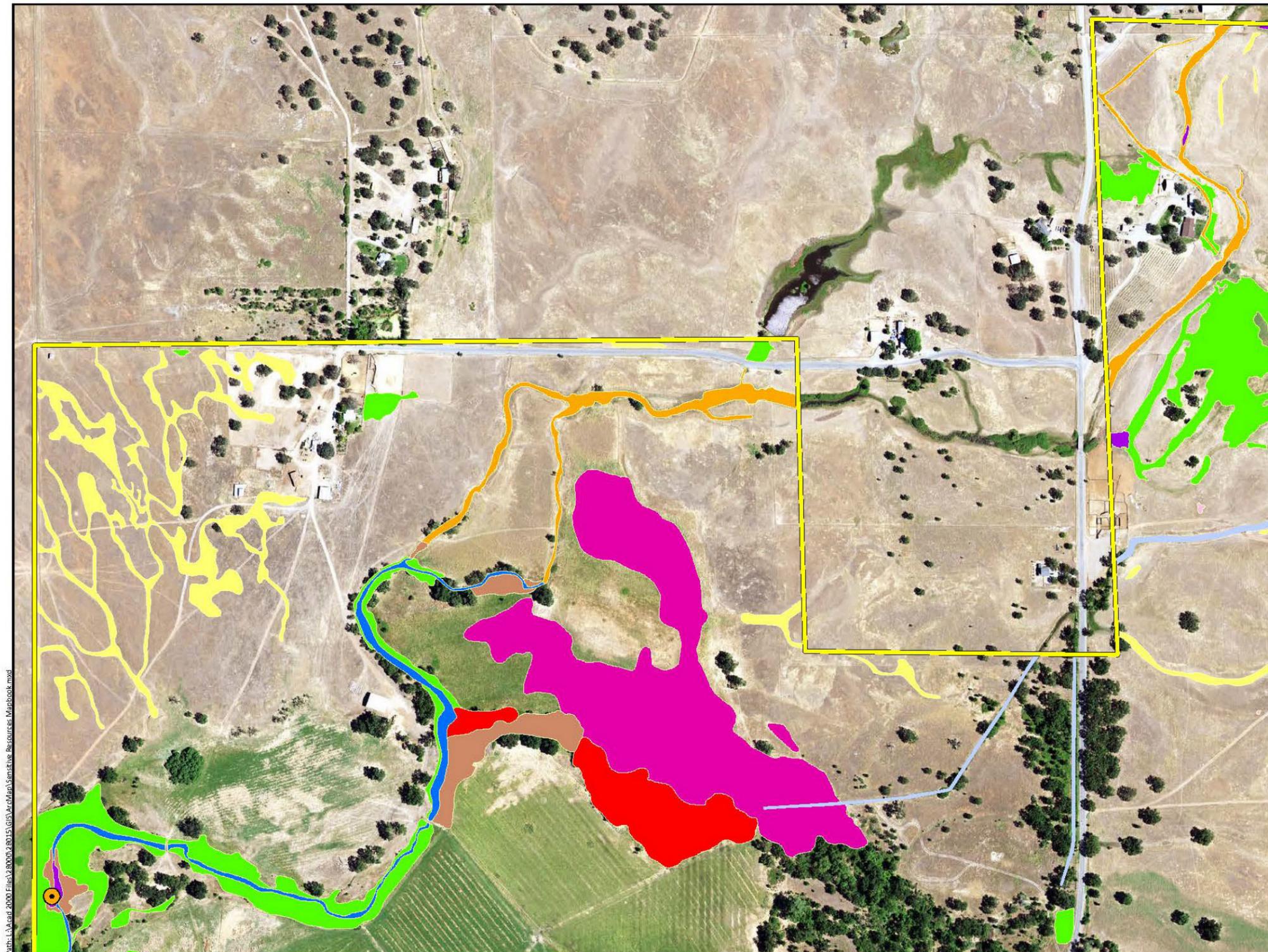
Figure 3. Wetlands and Waters within the Study Area



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Sources: 2016 Valtus Aerial, WRA | Prepared By: mrochelle, 5/22/2018

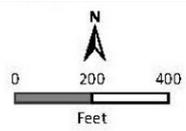
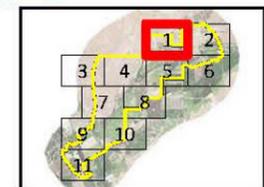
Figure 4. Sensitive Resources within the Study Area (Sheet 1)



**Figure 4.**  
**Sensitive Resources**  
**within the Study Area**  
**(Sheet 1)**

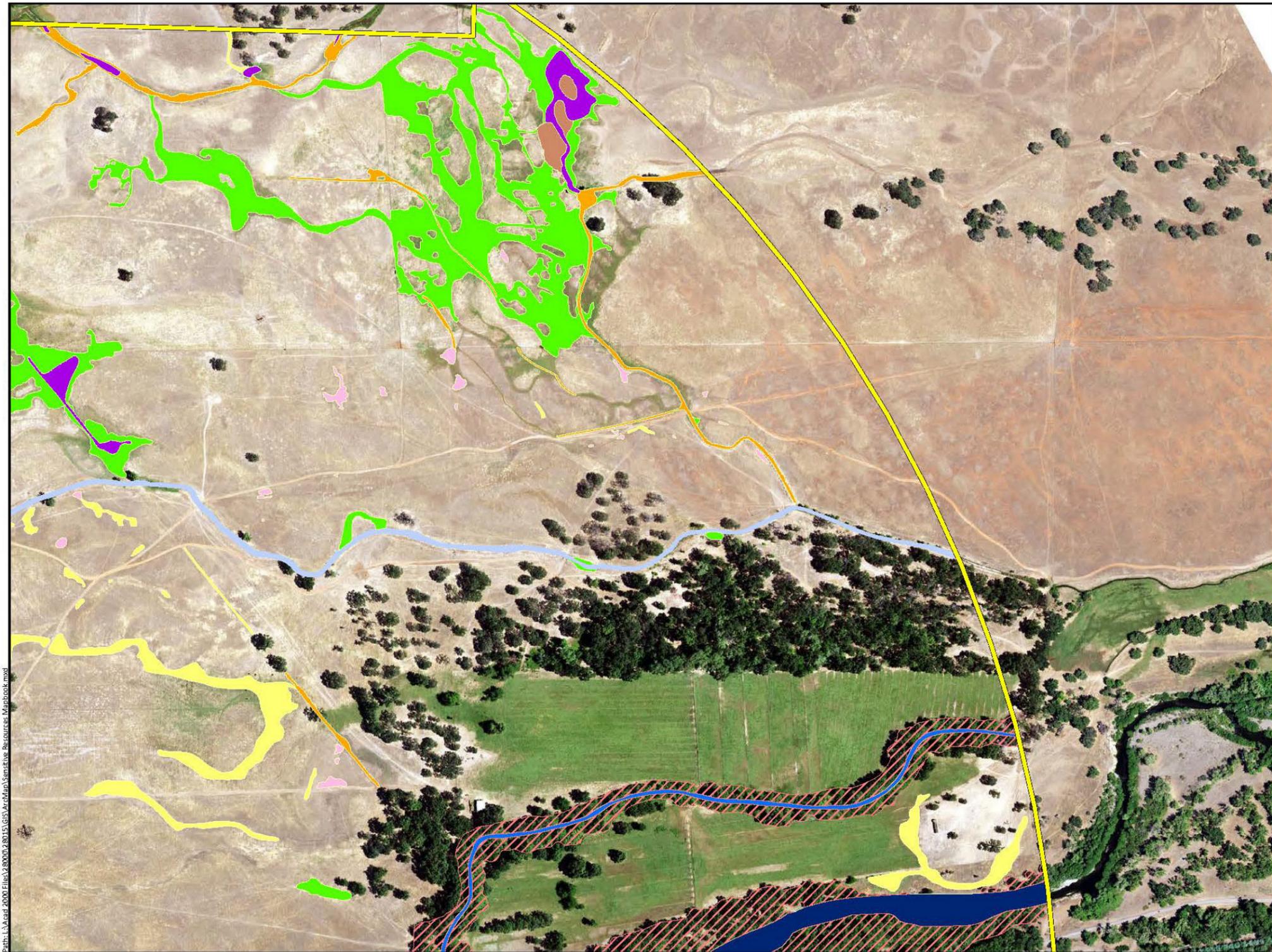
Lower Deer Creek  
 Tehama County, California

- Study Area - 2,827.24 ac.
- Plant Observations**
- ▲ Shield-bracted monkeyflower
- Hogwallow starfish (1000's individuals)
- Wildlife Observations**
- Great blue heron (rookery)
- ▲ Northern harrier (foraging)
- Tricolored blackbird
- ◑ Western pond turtle
- Sensitive Communities**
- Riparian Woodland - 138.35 ac.
- Waters Features - 78.28 ac. & 93,484 LF**
- Canal - 13.77 ac. & 51,538 LF
- Intermittent Stream - 5.77 ac. & 11,970 LF
- Open Waters - 3.48 ac.
- Perennial Stream - 55.26 ac. & 29,976 LF
- Wetland Features - 298.55 ac.**
- Freshwater Marsh - 16.71 ac.
- Irrigated Seasonal Wetland - 16.95 ac.
- Riparian Wetland - 3.34 ac.
- Seasonal Wetland - 82.88 ac.
- Seasonal Wetland Ditch - 12.72 ac.
- Vernal Pool - 2.15 ac.
- Vernal Swale - 156.92 ac.
- Willow Scrub Wetland - 6.88 ac.



Sources: 2016 Valtus Aerial, WRA | Prepared By: mrochelle, 5/17/2018

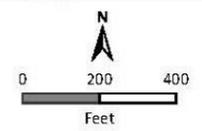
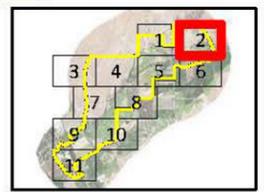
Figure 4. Sensitive Resources within the Study Area (Sheet 2)



**Figure 4.**  
**Sensitive Resources**  
**within the Study Area**  
**(Sheet 2)**

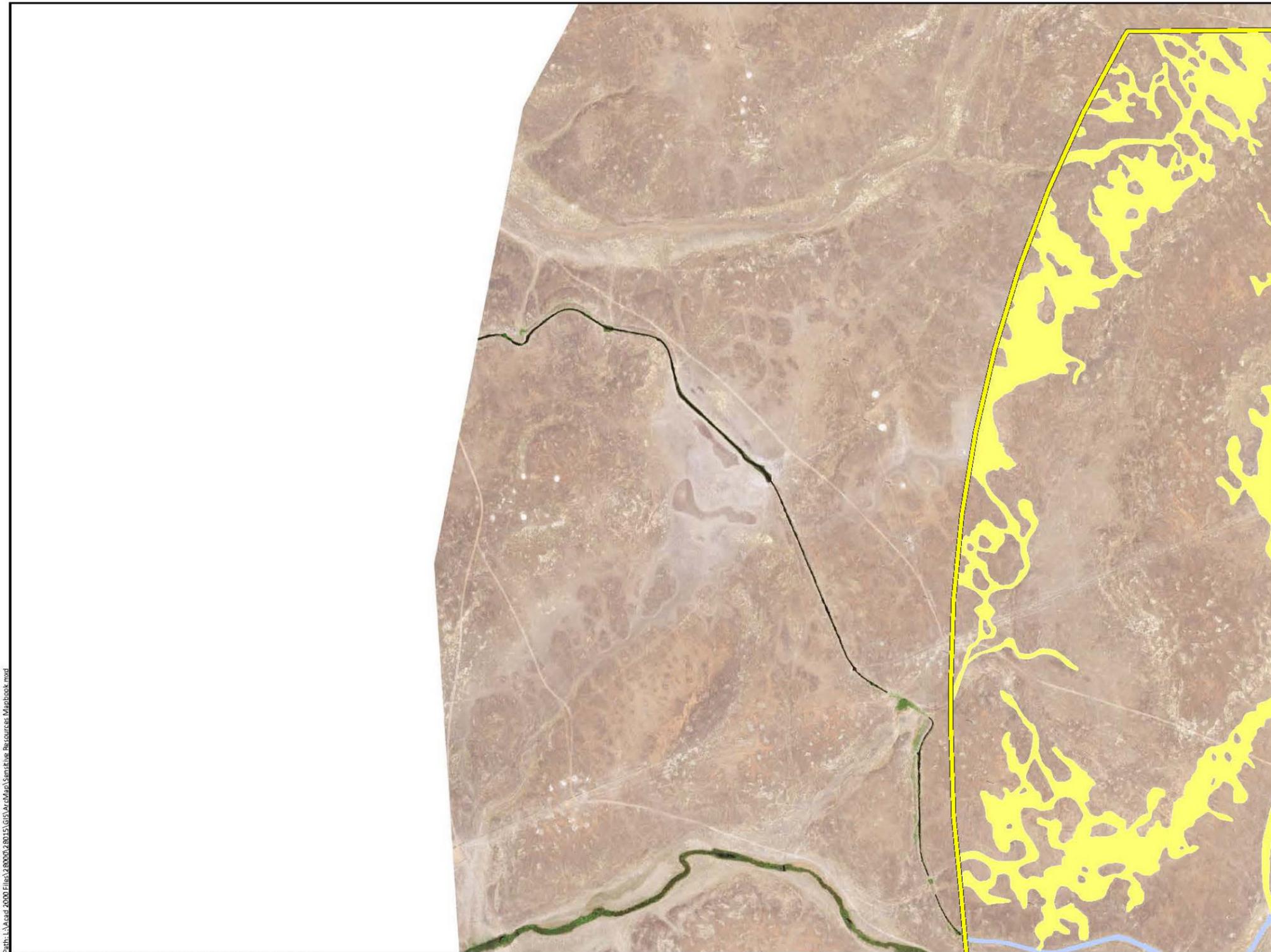
Lower Deer Creek  
 Tehama County, California

- Study Area - 2,827.24 ac.
- Plant Observations**
- ▲ Shield-bracted monkeyflower
- Hogwallow starfish (1000's individuals)
- Wildlife Observations**
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- Sensitive Communities**
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Sources: 2016 Valtus Aerial, WRA | Prepared By: mrochelle, 5/17/2018

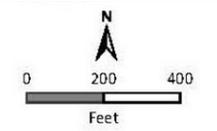
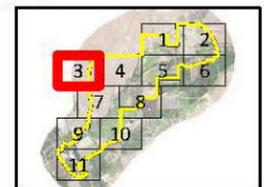
Figure 4. Sensitive Resources within the Study Area (Sheet 3)



**Figure 4.**  
**Sensitive Resources**  
**within the Study Area**  
**(Sheet 3)**

Lower Deer Creek  
Tehama County, California

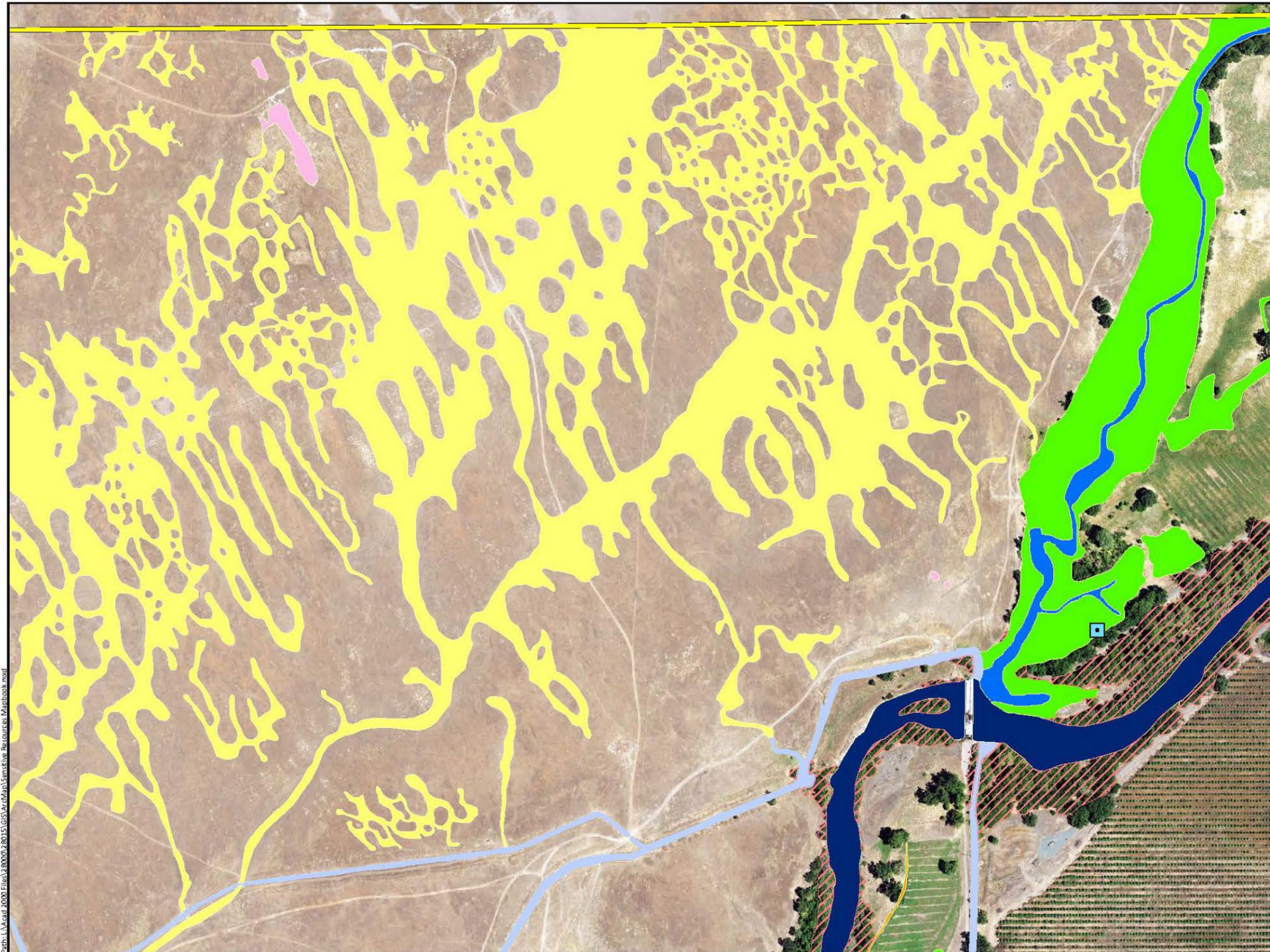
- Study Area - 2,827.24 ac.
- Plant Observations**
- ▲ Shield-bracted monkeyflower
- Hogwallow starfish (1000's individuals)
- Wildlife Observations**
- Great blue heron (rookery)
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- Tricolored blackbird
- Western pond turtle
- Sensitive Communities**
- Riparian Woodland - 138.35 ac.
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- Vernal Pool - 2.15 ac.
- Vernal Swale - 156.92 ac.
- Willow Scrub Wetland - 6.88 ac.



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Sources: 2016 Valtus Aerial, WRA | Prepared By: mrochelle, 5/17/2018

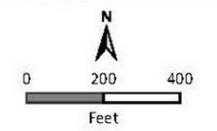
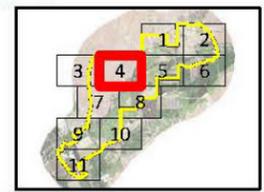
Figure 4. Sensitive Resources within the Study Area (Sheet 4)



**Figure 4.**  
**Sensitive Resources**  
**within the Study Area**  
**(Sheet 4)**

Lower Deer Creek  
 Tehama County, California

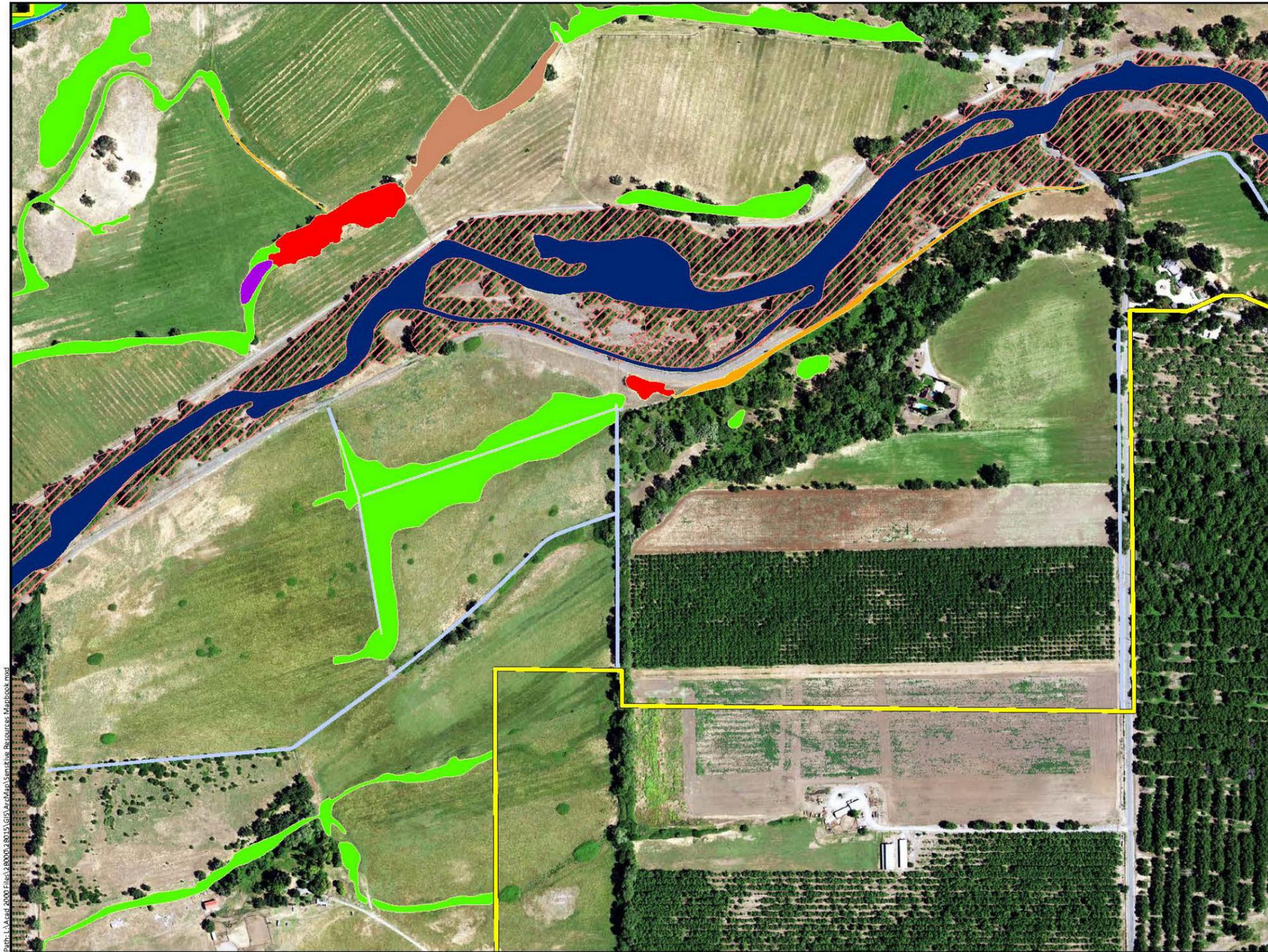
- Study Area - 2,827.24 ac.
- Plant Observations**
- ▲ Shield-bracted monkeyflower
- Hogwallow starfish (1000's individuals)
- Wildlife Observations**
- Great blue heron (rookery)
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- Seasonal Wetland Ditch - 12.72 ac.
- Vernal Pool - 2.15 ac.
- Vernal Swale - 156.92 ac.
- Willow Scrub Wetland - 6.88 ac.



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Sources: 2016 Valtus Aerial, WRA | Prepared By: mrochelle, 5/17/2018

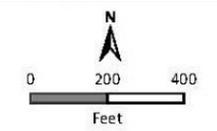
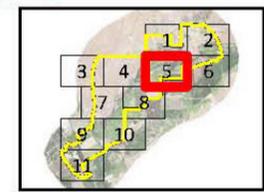
Figure 4. Sensitive Resources within the Study Area (Sheet 5)



**Figure 4.**  
**Sensitive Resources**  
**within the Study Area**  
**(Sheet 5)**

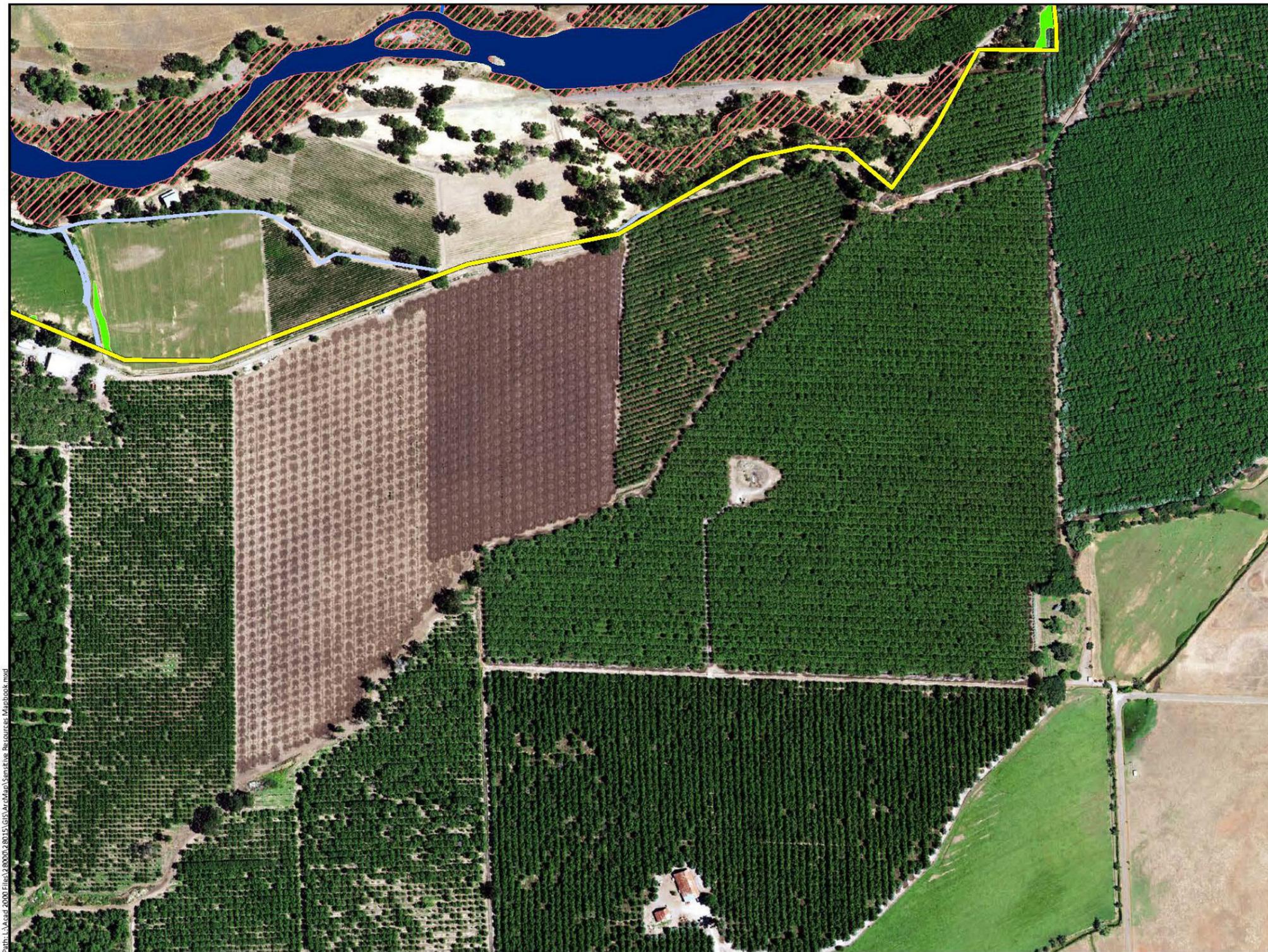
Lower Deer Creek  
 Tehama County, California

- Study Area - 2,827.24 ac.
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- Willow Scrub Wetland - 6.88 ac.



Sources: 2016 Val tus Aerial, WRA | Prepared By: mrochelle, 5/17/2018

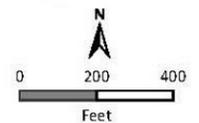
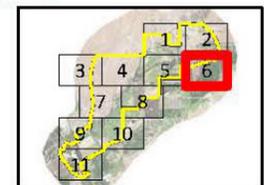
Figure 4. Sensitive Resources within the Study Area (Sheet 6)



**Figure 4.**  
Sensitive Resources  
within the Study Area  
(Sheet 6)

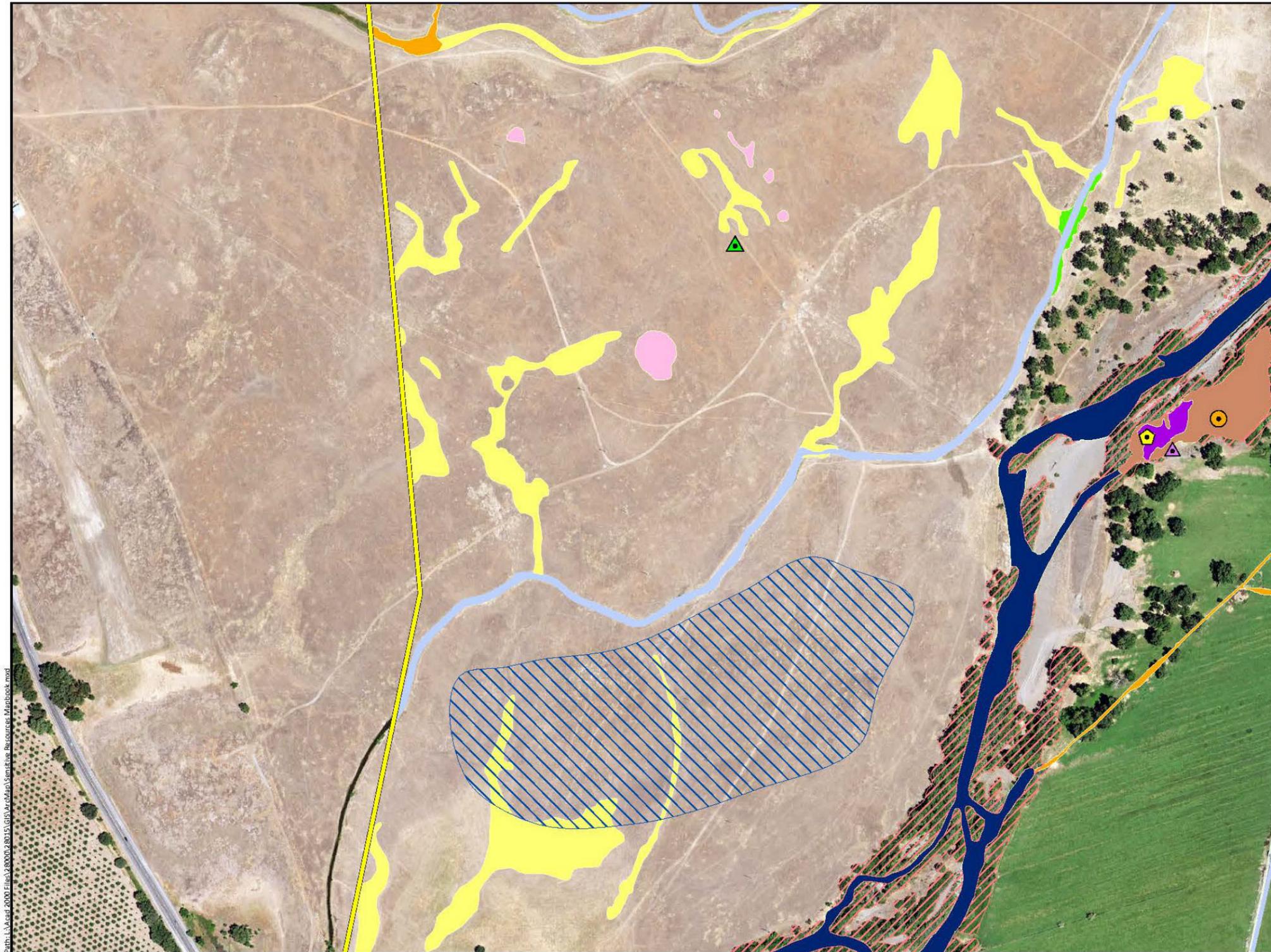
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- Sensitive Communities**
- Riparian Woodland - 138.35 ac.
- Waters Features - 78.28 ac. & 93,484 LF**
- Canal - 13.77 ac. & 51,538 LF
- Intermittent Stream - 5.77 ac. & 11,970 LF
- Open Waters - 3.48 ac.
- Perennial Stream - 55.26 ac. & 29,976 LF
- Wetland Features - 298.55 ac.**
- Freshwater Marsh - 16.71 ac.
- Irrigated Seasonal Wetland - 16.95 ac.
- Riparian Wetland - 3.34 ac.
- Seasonal Wetland - 82.88 ac.
- Seasonal Wetland Ditch - 12.72 ac.
- Vernal Pool - 2.15 ac.
- Vernal Swale - 156.92 ac.
- Willow Scrub Wetland - 6.88 ac.



Sources: 2016 Val tus Aerial, WRA | Prepared By: mrochelle, 5/17/2018

Figure 4. Sensitive Resources within the Study Area (Sheet 7)



Sources: 2016 Val tus Aerial, WRA | Prepared By: mrochelle, 5/17/2018

**Figure 4.**  
**Sensitive Resources**  
**within the Study Area**  
**(Sheet 7)**

Lower Deer Creek  
 Tehama County, California

- Study Area - 2,827.24 ac.
- Plant Observations**
- ▲ Shield-bracted monkeyflower
- Hogwallow starfish (1000's individuals)
- Wildlife Observations**
- Great blue heron (rookery)
- ▲ Northern harrier (foraging)
- Tricolored black bird
- ◡ Western pond turtle
- Sensitive Communities**
- Riparian Woodland - 138.35 ac.
- Waters Features - 78.28 ac. & 93,484 LF**
- Canal - 13.77 ac. & 51,538 LF
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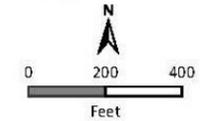
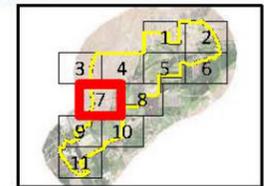
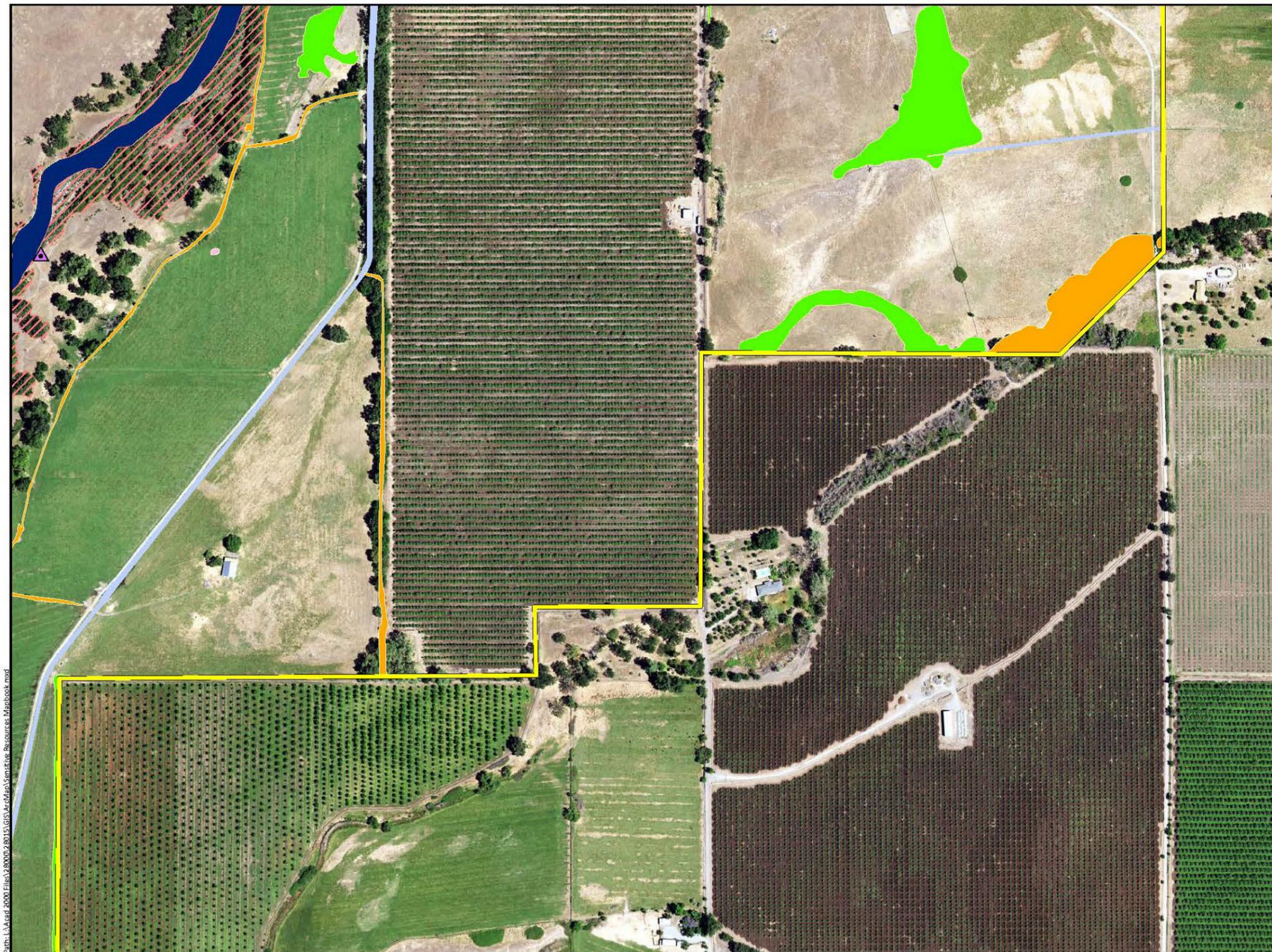


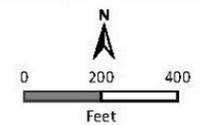
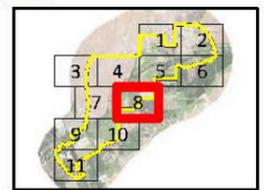
Figure 4. Sensitive Resources within the Study Area (Sheet 8)



**Figure 4.**  
**Sensitive Resources**  
**within the Study Area**  
**(Sheet 8)**

Lower Deer Creek  
 Tehama County, California

- Study Area - 2,827.24 ac.
- Plant Observations**
- ▲ Shield-bracted monkeyflower
- ▨ Hogwallow starfish (1000's individuals)
- Wildlife Observations**
- Great blue heron (rookery)
- ▲ Northern harrier (foraging)
- Tricolored blackbird
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- Sensitive Communitie**
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- Vernal Swale - 156.92 ac.
- Willow Scrub Wetland - 6.88 ac.



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Sources: 2016 Valtus Aerial, WRA | Prepared By: mrochelle, 5/17/2018

Figure 4. Sensitive Resources within the Study Area (Sheet 9)



Sources: 2016 Val tus Aerial, WRA | Prepared By: mrochelle, 5/17/2018

**Figure 4.  
Sensitive Resources  
within the Study Area  
(Sheet 9)**

Lower Deer Creek  
Tehama County, California

Study Area - 2,827.24 ac.

**Plant Observations**

- Shield-bracted monkeyflower
- Hogwallow starfish (1000's individuals)

**Wildlife Observations**

- Great blue heron (rookery)
- Northern harrier (foraging)
- Tricolored blackbird
- Western pond turtle

**Sensitive Communities**

- Riparian Woodland - 138.35 ac.

**Waters Features - 78.28 ac. & 93,484 LF**

- Canal - 13.77 ac. & 51,538 LF
- Intermittent Stream - 5.77 ac. & 11,970 LF
- Open Waters - 3.48 ac.
- Perennial Stream - 55.26 ac. & 29,976 LF

**Wetland Features - 298.55 ac.**

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- Riparian Wetland - 3.34 ac.
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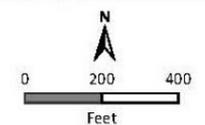
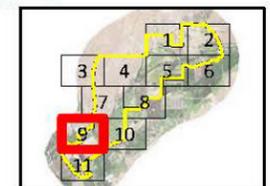


Figure 4. Sensitive Resources within the Study Area (Sheet 10)



Sources: 2016 Valtus Aerial, WRA | Prepared By: mrochelle, 5/17/2018

**Figure 4.**  
**Sensitive Resources**  
**within the Study Area**  
**(Sheet 10)**

Lower Deer Creek  
Tehama County, California

- Study Area - 2,827.24 ac.
- Plant Observations**
- ▲ Shield-bracted monkeyflower
- Hogwallow starfish (1000's individuals)
- Wildlife Observations**
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- Western pond turtle
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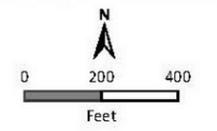
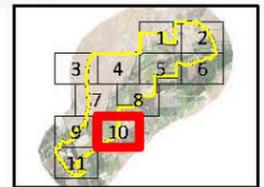
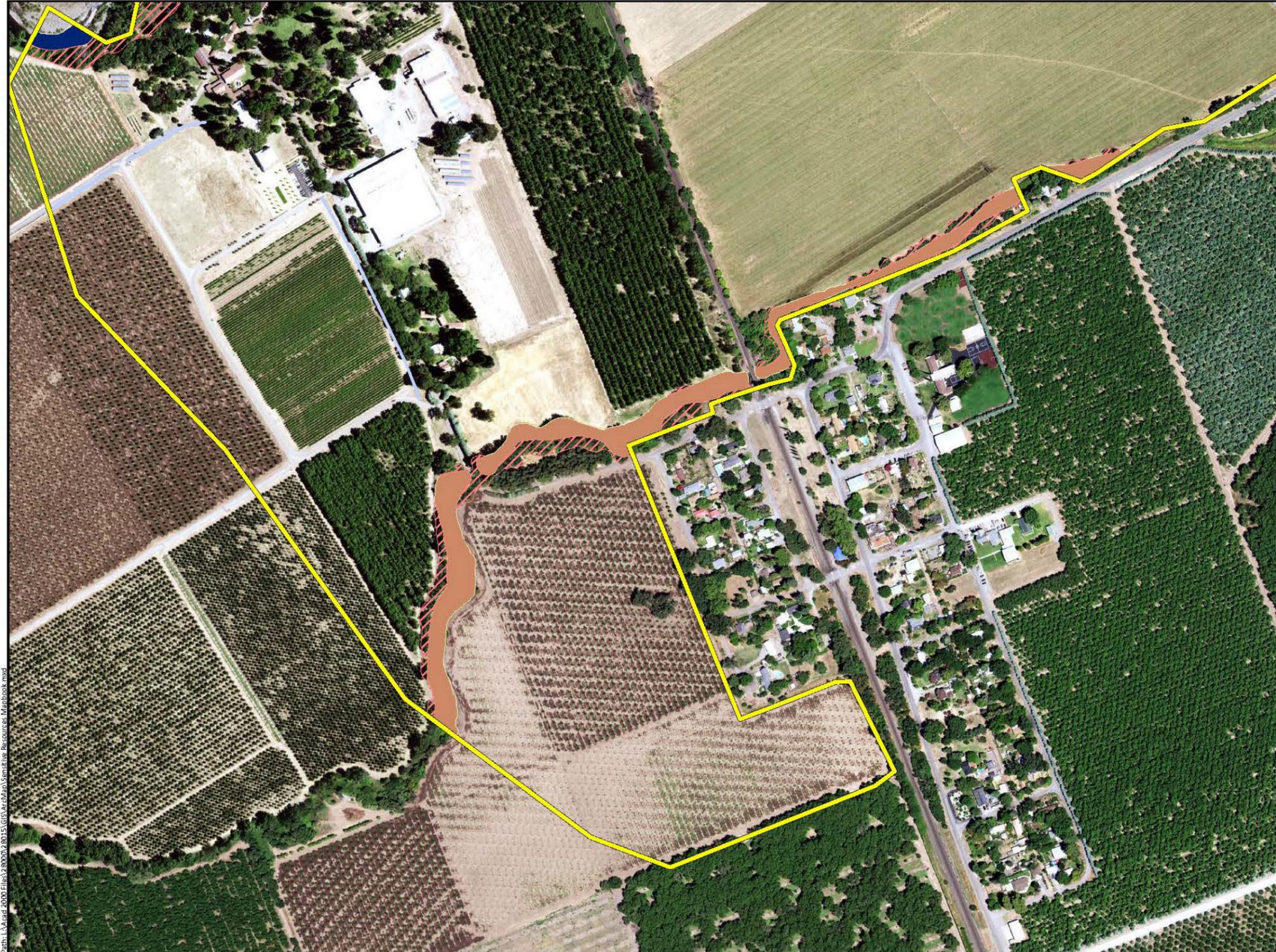


Figure 4. Sensitive Resources within the Study Area (Sheet 11)



Sources: 2016 Valtus Aerial, WRA | Prepared By: mrochelle, 5/17/2018

**Figure 4.  
Sensitive Resources  
within the Study Area  
(Sheet 11)**

Lower Deer Creek  
Tehama County, California

- Study Area - 2,827.24 ac.
- Plant Observations**
- ▲ Shield-bracted monkeyflower
- Hogwallow starfish (1000's individuals)
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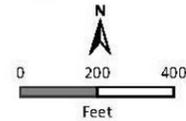
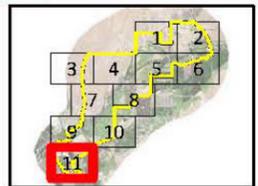
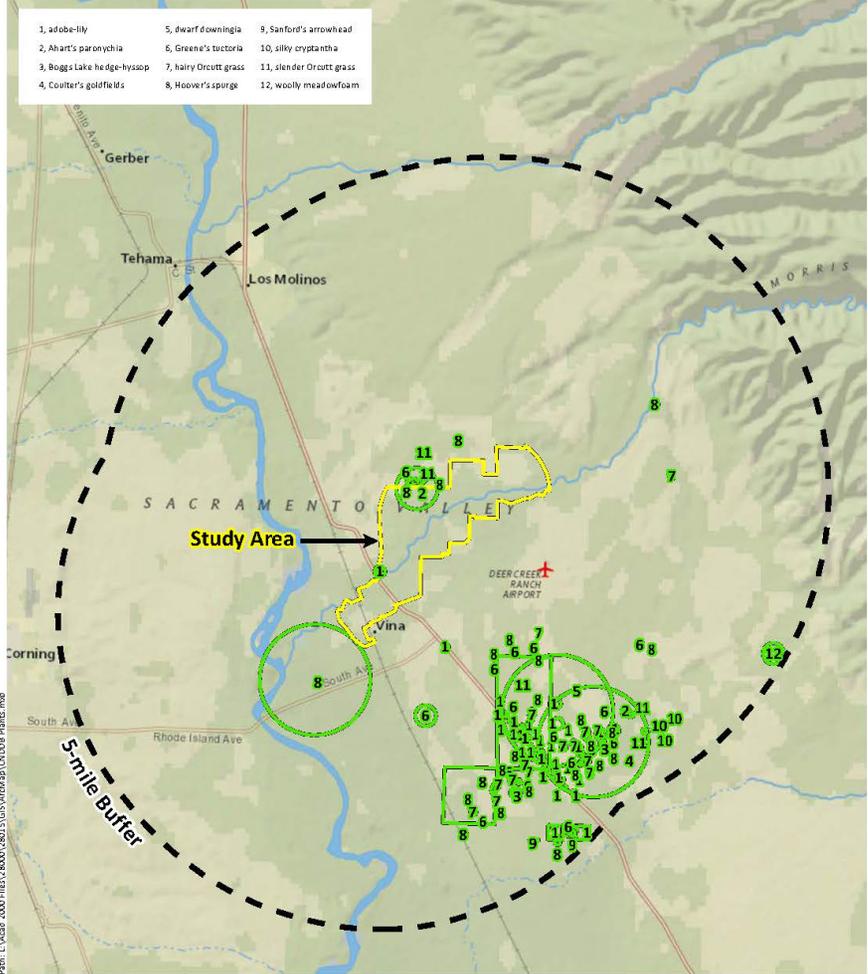


Figure 5. CNDDDB Occurrences for Special-status Plants Within 5 Miles of the Study Area



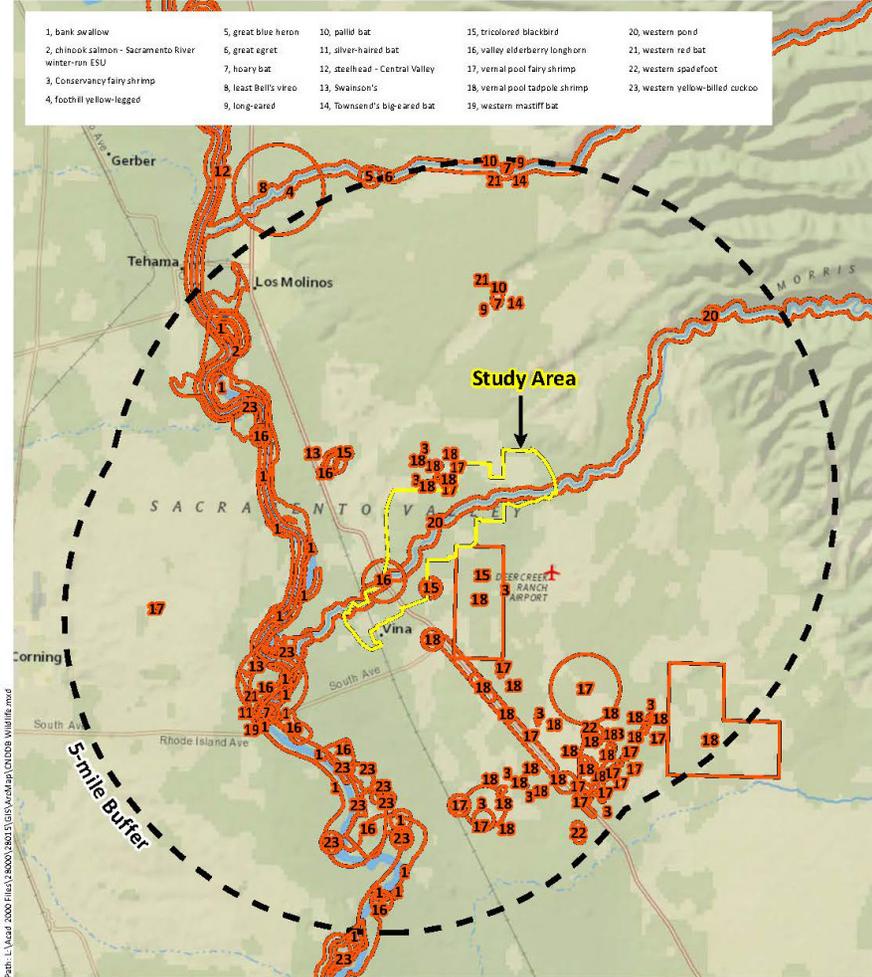
Sources: National Geographic, CNDDDB March 2018, WRA | Prepared By: mrochelle, 5/17/2018

Figure 5. CNDDDB Occurrences for Special-status Plants Within 5 Miles of the Study Area

Lower Deer Creek  
Tehama County, California

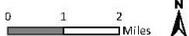


**Figure 6. CNDDDB Occurrences for Special-status Wildlife Within 5 Miles of the Study Area**



**Figure 6. CNDDDB Occurrences for Special-status Wildlife Within 5 Miles of the Study Area**

Lower Deer Creek  
Tehama County, California



**APPENDIX B: OBSERVED PLANT AND WILDLIFE SPECIES**

**Appendix B-1. Plant Species Observed in the Study Area (April 3–5, 2018)**

Scientific Name	Common Name	Origin	Form	Rarity Status	CAL-IPC Status	Wetland Status (AW 2016)
<i>Acer macrophyllum</i>	Bigleaf maple	native	tree	NA	NA	FAC
<i>Achyrachaena mollis</i>	Blow wives	native	annual herb	NA	NA	FAC
<i>Acmispon wrangelianus</i>	Chilean trefoil	native	annual herb	NA	NA	NA
<i>Aesculus californica</i>	Buckeye	native	tree	NA	NA	NA
<i>Agrostis gigantea</i>	Creeping bentgrass	non-native	perennial grass	NA	NA	FACW
<i>Ailanthus altissima</i>	Tree of heaven	non-native (invasive)	tree	NA	Moderate	FACU
<i>Aira caryophyllea</i>	Silvery hairgrass	non-native	annual grass	NA	NA	FACU
<i>Alnus rhombifolia</i>	White alder	native	tree	NA	NA	FACW
<i>Amsinckia intermedia</i>	Common fiddleneck	native	annual herb	NA	NA	NA
<i>Amsinckia menziesii</i>	Fiddleneck	native	annual herb	NA	NA	NA
<i>Anthriscus caucalis</i>	Bur chervil	non-native	annual herb, vine	NA	NA	NA
<i>Artemisia douglasiana</i>	California mugwort	native	perennial herb	NA	NA	FAC
<i>Avena barbata</i>	Slim oat	non-native (invasive)	annual, perennial grass	NA	Moderate	NA
<i>Avena sativa</i>	Wild oat	non-native	annual, perennial grass	NA	NA	UPL
<i>Azolla filiculoides</i>	Mosquito fern	native	fern	NA	NA	OBL
<i>Baccharis salicifolia</i> ssp. <i>salicifolia</i>	Mule fat	native	shrub	NA	NA	FAC
<i>Briza minor</i>	Little rattlesnake grass	non-native	annual grass	NA	NA	FAC
<i>Bromus catharticus</i>	Rescue grass	non-native	annual, perennial grass	NA	NA	NA
<i>Bromus diandrus</i>	Ripgut brome	non-native (invasive)	annual grass	NA	Moderate	NA

Scientific Name	Common Name	Origin	Form	Rarity Status	CAL-IPC Status	Wetland Status (AW 2016)
<i>Bromus hordeaceus</i>	Soft chess	non-native (invasive)	annual grass	NA	Limited	FACU
<i>Bromus madritensis</i>	Foxtail chess, foxtail brome	non-native	annual grass	NA	NA	UPL
<i>Calandrinia menziesii</i>	Red maids	native	annual herb	NA	NA	FACU
<i>Calycanthus occidentalis</i>	Spicebush	native	shrub	NA	NA	FAC
<i>Camissoniopsis sp.</i>	-	-	-	NA	NA	-
<i>Capsella bursa-pastoris</i>	Shepherd's purse	non-native	annual herb	NA	NA	FACU
<i>Cardamine oligosperma</i>	Idaho bittercress	native	annual, perennial herb	NA	NA	FAC
<i>Carex barbarae</i>	Valley sedge	native	perennial grasslike herb	NA	NA	FAC
<i>Carex sp.</i>	-	-	-	NA	NA	NA
<i>Castilleja attenuata</i>	Narrow leaved owl's clover	native	annual herb	NA	NA	NA
<i>Ceanothus cuneatus var. cuneatus</i>	Buck brush	native	shrub	NA	NA	NA
<i>Centaurea solstitialis</i>	Yellow starthistle	non-native (invasive)	annual herb	NA	High	NA
<i>Cerastium glomeratum</i>	Large mouse ears	non-native	annual herb	NA	NA	UPL
<i>Cercis occidentalis</i>	Western redbud	native	tree, shrub	NA	NA	NA
<i>Claytonia perfoliata</i>	Miner's lettuce	native	annual herb	NA	NA	FAC
<i>Conium maculatum</i>	Poison hemlock	non-native (invasive)	perennial herb	NA	Moderate	FACW
<i>Convolvulus arvensis</i>	Field bindweed	non-native	perennial herb, vine	NA	NA	NA
<i>Croton setiger</i>	Turkey-mullein	native	perennial herb	NA	NA	NA
<i>Cryptantha sp.</i>	-	-	-	NA	NA	NA
<i>Cynosurus echinatus</i>	Dogtail grass	non-native (invasive)	annual grass	NA	Moderate	NA

Scientific Name	Common Name	Origin	Form	Rarity Status	CAL-IPC Status	Wetland Status (AW 2016)
<i>Datura stramonium</i>	Jimson weed	non-native	annual herb	NA	NA	NA
<i>Deschampsia danthonioides</i>	Annual hairgrass	native	annual grass	NA	NA	FACW
<i>Dichelostemma capitatum</i>	Blue dicks	native	perennial herb	NA	NA	FACU
<i>Elymus caput-medusae</i>	Medusa head	non-native (invasive)	annual grass	NA	High	NA
<i>Epilobium brachycarpum</i>	Willow herb	native	annual herb	NA	NA	NA
<i>Epilobium sp.</i>	-	-	-	NA	NA	NA
<i>Equisetum sp.</i>	-	-	-	NA	NA	NA
<i>Eriodictyon californicum</i>	Yerba santa	native	shrub	NA	NA	NA
<i>Erodium botrys</i>	Big heron bill	non-native	annual herb	NA	NA	FACU
<i>Erodium brachycarpum</i>	White stemmed filaree	non-native	annual herb	NA	NA	NA
<i>Erodium cicutarium</i>	Coastal heron's bill	non-native (invasive)	annual herb	NA	Limited	NA
<i>Erodium moschatum</i>	Whitestem filaree	non-native	annual herb	NA	NA	NA
<i>Eryngium castrense</i>	Great valley button celery	native	perennial herb	NA	NA	OBL
<i>Eschscholzia californica</i>	California poppy	native	annual, perennial herb	NA	NA	NA
<i>Festuca arundinacea</i>	Reed fescue	non-native (invasive)	perennial grass	NA	Moderate	FACU
<i>Festuca bromoides</i>	Brome fescue	non-native	annual grass	NA	NA	FACU
<i>Festuca microstachys</i>	Small fescue	native	annual grass	NA	NA	NA
<i>Festuca perennis</i>	Italian rye grass	non-native (invasive)	annual, perennial grass	NA	Moderate	FAC
<i>Ficus carica</i>	Common fig	non-native (invasive)	tree	NA	Moderate	FACU

Scientific Name	Common Name	Origin	Form	Rarity Status	CAL-IPC Status	Wetland Status (AW 2016)
<i>Frangula californica</i> <i>ssp. tomentella</i>	Hoary coffeeberry	native	shrub	NA	NA	NA
<i>Galium aparine</i>	Cleavers	native	annual herb	NA	NA	FACU
<i>Genista monspessulana</i>	French broom	non-native (invasive)	shrub	NA	High	NA
<i>Grindelia sp.</i>	NA	NA	NA	NA	NA	NA
<i>Helminthotheca</i> <i>echioides</i>	Bristly ox-tongue	non-native (invasive)	annual, perennial herb	NA	Limited	FAC
<i>Hesperevax caulescens</i>	Hogwallow starfish	native	annual herb	Rank 4.2	NA	OBL
<i>Heterotheca grandiflora</i>	Telegraph weed	native	annual, perennial herb	NA	NA	NA
<i>Hordeum marinum</i> <i>ssp. gussoneanum</i>	Barley	non-native (invasive)	annual grass	NA	Moderate	FAC
<i>Hordeum murinum</i>	Foxtail barley	non-native (invasive)	annual grass	NA	Moderate	FACU
<i>Hypochaeris glabra</i>	Smooth cats ear	non-native (invasive)	annual herb	NA	Limited	NA
<i>Juglans hindsii</i>	Northern california black walnut	native	tree	Rank 1B.1	NA	FAC
<i>Juglans regia</i>	English walnut	non-native	tree	NA	NA	NA
<i>Juncus effusus</i>	Common bog rush	native	perennial grasslike herb	NA	NA	FACW
<i>Juncus mexicanus</i>	Mexican rush	native	perennial grasslike herb	NA	NA	FACW
<i>Juncus patens</i>	Rush	native	perennial grasslike herb	NA	NA	FACW
<i>Lactuca serriola</i>	Prickly lettuce	non-native	annual herb	NA	NA	FACU
<i>Lamium amplexicaule</i>	Henbit	non-native	annual herb	NA	NA	NA

Scientific Name	Common Name	Origin	Form	Rarity Status	CAL-IPC Status	Wetland Status (AW 2016)
<i>Lasthenia californica</i> ssp. <i>californica</i>	California goldfields	native	annual herb	NA	NA	FACU
<i>Lasthenia fremontii</i>	Vernal pool goldfields	native	annual, perennial herb	NA	NA	OBL
<i>Lasthenia glaberrima</i>	Smooth goldfields	native	annual herb	NA	NA	OBL
<i>Layia fremontii</i>	Fremont's tidy tips	native	annual herb	NA	NA	NA
<i>Leontodon saxatilis</i>	Hawkbit	non-native	annual herb	NA	NA	FACU
<i>Lepidium nitidum</i>	Shining pepper grass	native	annual herb	NA	NA	FAC
<i>Lepidium perfoliatum</i>	Klamath pepper grass	non-native	annual herb	NA	NA	FACU
<i>Limnanthes douglasii</i> ssp. <i>nivea</i>	Douglas' meadowf oam	native	annual herb	NA	NA	OBL
<i>Lomatium caruifolium</i> var. <i>denticulatum</i>	Caraway leaved lomatium	native	perennial herb	NA	NA	FACW
<i>Lonicera japonica</i>	Japanese honeysuckle	non-native	vine, shrub	NA	NA	FACU
<i>Lotus corniculatus</i>	Bird's foot trefoil	non-native	perennial herb	NA	NA	FAC
<i>Lupinus bicolor</i>	Lupine	native	annual, perennial herb	NA	NA	NA
<i>Lupinus succulentus</i>	Arroyo lupine	native	annual herb	NA	NA	NA
<i>Lythrum hyssopifolia</i>	Hyssop loosestrife	non-native (invasive)	annual, perennial herb	NA	Limited	OBL
<i>Malva parviflora</i>	Cheeseweed	non-native	annual herb	NA	NA	NA
<i>Marah fabacea</i>	California man-root	native	perennial herb, vine	NA	NA	NA
<i>Marrubium vulgare</i>	White horehound	non-native (invasive)	perennial herb	NA	Limited	FACU

Scientific Name	Common Name	Origin	Form	Rarity Status	CAL-IPC Status	Wetland Status (AW 2016)
<i>Mentha pulegium</i>	Pennyroyal	non-native (invasive)	perennial herb	NA	Moderate	OBL
<i>Microseris douglasii</i> ssp. <i>douglasii</i>	Douglas' microseris	native	annual herb	NA	NA	FACU
<i>Mimulus glaucescens</i>	Shield bracted monkeyflower	native	annual herb	Rank 4.3	NA	OBL
<i>Mimulus guttatus</i>	Yellow monkey flower	native	annual, perennial herb (rhizomatous)	NA	NA	OBL
<i>Navarretia leucocephala</i> ssp. <i>leucocephala</i>	White headed navarretia	native	annual herb	NA	NA	OBL
<i>Persicaria</i> sp.	NA	NA	NA	NA	NA	NA
<i>Petrorhagia dubia</i>	Windmill pink	non-native	annual herb	NA	NA	NA
<i>Phacelia</i> sp.	-	-	-	NA	NA	NA
<i>Phalaris lemmonii</i>	Lemmon's canarygrass	native	annual grass	NA	NA	FACW
<i>Phoradendron leucarpum</i> ssp. <i>macrophyllum</i>	Big leaf mistletoe	native	shrub (parasitic)	NA	NA	NA
<i>Phoradendron leucarpum</i> ssp. <i>tomentosum</i>	Mistletoe	native	shrub (parasitic)	NA	NA	NA
<i>Plagiobothrys</i> sp.	-	-	-	NA	NA	NA
<i>Plantago erecta</i>	California plantain	native	annual herb	NA	NA	NA
<i>Plantago lanceolata</i>	Ribwort	non-native (invasive)	perennial herb	NA	Limited	FAC
<i>Platanus racemosa</i>	California sycamore	native	tree	NA	NA	FAC
<i>Poa annua</i>	Annual blue grass	non-native	annual grass	NA	NA	FAC

Scientific Name	Common Name	Origin	Form	Rarity Status	CAL-IPC Status	Wetland Status (AW 2016)
<i>Poa bulbosa</i>	Bulbous blue grass	non-native	perennial grass	NA	NA	FACU
<i>Poa sp.</i>	-	-	-	NA	NA	NA
<i>Pogogyne zizyphoroides</i>	Sacramento mint	native	annual herb	NA	NA	OBL
<i>Polygonum aviculare</i>	Prostrate knotweed	non-native	annual, perennial herb	NA	NA	FAC
<i>Prunus cerasifera</i>	Cherry plum	non-native (invasive)	tree	NA	Limited	NA
<i>Pseudognaphalium luteoalbum</i>	Jersey cudweed	non-native	annual herb	NA	NA	FAC
<i>Psilocarphus brevissimus var. brevissimus</i>	Woolly heads	native	annual herb	NA	NA	FACW
<i>Quercus lobata</i>	Valley oak	native	tree	NA	NA	FACU
<i>Quercus wislizeni</i>	Interior live oak, chapparal oak	native	tree, shrub	NA	NA	NA
<i>Ranunculus aquatilis</i>	Whitewater crowfoot	native	perennial herb (aquatic)	NA	NA	OBL
<i>Ranunculus muricatus</i>	Buttercup	non-native	annual, perennial herb	NA	NA	FACW
<i>Ranunculus occidentalis</i>	Western buttercup	native	perennial herb	NA	NA	FAC
<i>Raphanus sativus</i>	Radish	non-native (invasive)	annual, biennial herb	NA	Limited	NA
<i>Rosa californica</i>	California wild rose	native	shrub	NA	NA	FAC
<i>Rubus armeniacus</i>	Himalayan blackberry	non-native (invasive)	shrub	NA	High	FAC
<i>Rubus ursinus</i>	California blackberry	native	vine, shrub	NA	NA	FAC
<i>Salix babylonica</i>	Weeping willow	non-native	tree	NA	NA	FAC

Scientific Name	Common Name	Origin	Form	Rarity Status	CAL-IPC Status	Wetland Status (AW 2016)
<i>Salix exigua</i>	Narrowleaf willow	native	tree, shrub	NA	NA	FACW
<i>Salix laevigata</i>	Polished willow	native	tree	NA	NA	FACW
<i>Salix lasiolepis</i>	Arroyo willow	native	tree, shrub	NA	NA	FACW
<i>Salix scouleriana</i>	Scouler willow	native	tree, shrub	NA	NA	FAC
<i>Sambucus nigra</i> ssp. <i>caerulea</i>	Blue elderberry	native	shrub	NA	NA	FAC
<i>Sanicula bipinnatifida</i>	Purple sanicle	native	perennial herb	NA	NA	NA
<i>Schoenoplectus acutus</i> var. <i>occidentalis</i>	Tule	native	perennial grasslike herb	NA	NA	OBL
<i>Sedella pumila</i>	Sierra mock stonecrop	native	annual herb	NA	NA	FAC
<i>Senecio vulgaris</i>	Common groundsel	non-native	annual herb	NA	NA	FACU
<i>Sherardia arvensis</i>	Field madder	non-native	annual herb	NA	NA	NA
<i>Silybum marianum</i>	Milk thistle	non-native (invasive)	annual, perennial herb	NA	Limited	NA
<i>Sisymbrium officinale</i>	Hedge mustard	non-native	annual herb	NA	NA	NA
<i>Sonchus asper</i> ssp. <i>asper</i>	Sow thistle	non-native	annual herb	NA	NA	FAC
<i>Spergularia rubra</i>	Purple sand spurry	non-native	annual, perennial herb	NA	NA	FAC
<i>Stellaria media</i>	Chickweed	non-native	annual herb	NA	NA	FACU
<i>Taraxacum officinale</i>	Red seeded dandelion	non-native	perennial herb	NA	NA	FACU
<i>Toxicodendron diversilobum</i>	Poison oak	native	vine, shrub	NA	NA	FACU
<i>Trifolium depauperatum</i>	Dwarf sack clover	native	annual herb	NA	NA	FAC
<i>Trifolium dubium</i>	Shamrock	non-native	annual herb	NA	NA	UPL

Scientific Name	Common Name	Origin	Form	Rarity Status	CAL-IPC Status	Wetland Status (AW 2016)
<i>Trifolium hirtum</i>	Rose clover	non-native (invasive)	annual herb	NA	Limited	NA
<i>Trifolium repens</i>	White clover	non-native	perennial herb	NA	NA	FACU
<i>Triteleia hyacinthina</i>	Wild hyacinth	native	perennial herb	NA	NA	FAC
<i>Triteleia laxa</i>	Ithuriel's spear	native	perennial herb	NA	NA	NA
<i>Typha latifolia</i>	Broadleaf cattail	native	perennial herb (aquatic)	NA	NA	OBL
<i>Umbellularia californica</i>	California bay	native	tree	NA	NA	FAC
<i>Urtica dioica</i>	Stinging nettle	native	perennial herb	NA	NA	FAC
<i>Verbascum thapsus</i>	Woolly mullein	non-native (invasive)	perennial herb	NA	Limited	FACU
<i>Veronica persica</i>	Bird's eye speedwell	non-native	annual herb	NA	NA	NA
<i>Vicia sativa ssp. sativa</i>	Common vetch	non-native	annual herb, vine	NA	NA	FACU
<i>Vinca major</i>	Vinca	non-native (invasive)	perennial herb	NA	Moderate	NA
<i>Vitis californica</i>	California wild grape	native	vine, shrub	NA	NA	FACU
<i>Xanthium strumarium</i>	Cocklebur	native	annual herb	NA	NA	FAC

**APPENDIX C: POTENTIAL FOR SPECIAL-STATUS SPECIES TO OCCUR IN THE  
STUDY AREA**

**Appendix C.** Potential for special-status plant and wildlife species to occur in the Study Area. List compiled from the California Department of Fish and Wildlife (CDFW) Natural Diversity Database (CDFW 2018), U.S. Fish and Wildlife Service (USFWS) lists, and California Native Plant Society (CNPS) Electronic Inventory search of the Vina, Richardson Springs, Los Molinos, Acorn Hollow, Corning, Gerber, Kirkwood, Foster Island, and Nord USGS 7.5' quadrangles and a review of other CDFW lists and publications (Shuford and Gardali 2008, Thomson et al. 2016).

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	CONCLUSIONS/ RECOMMENDATIONS
<b>Plants</b>				
Henderson's bent grass <i>Agrostis hendersonii</i>	Rank 3.2	Valley and foothill grassland (mesic), vernal pools. Elevation ranges from 225 to 1000 feet (70 to 305 meters). Blooms April to June.	<b>Moderate Potential.</b> The Study Area contains potentially suitable seasonal wetland and vernal pool habitats which could support this species. However, identification of nearby Butte County occurrences of this species are reported as "questionable" (CNPS 2018).	Protocol-level special-status plant surveys may be recommended to determine presence or absence of this species within impact areas, dependent on project specifics.
depauperate milk-vetch <i>Astragalus pauperculus</i>	Rank 4.3	Chaparral, cismontane woodland, valley and foothill grassland/vernally mesic, volcanic. Elevation ranges from 200 to 3990 feet (60 to 1215 meters). Blooms March to June.	<b>Moderate Potential.</b> The Study Area supports suitable vernally mesic grassland with stony, volcanically-derived soils.	Protocol-level special-status plant surveys may be recommended to determine presence or absence of this species within impact areas, dependent on project specifics.
Ferris' milk-vetch <i>Astragalus tener var. ferrisiae</i>	Rank 1B.1	Meadows and seeps (vernally mesic), valley and foothill grassland (subalkaline flats). Elevation ranges from 10 to 250 feet (2 to 75 meters). Blooms April to May.	<b>Unlikely.</b> This species is typically associated with lower elevation subalkaline flats with dry, adobe soil. The Study Area lacks suitable dry adobe soils.	No further actions are recommended.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	CONCLUSIONS/ RECOMMENDATIONS
pink creamsacs <i>Castilleja rubicundula</i> var. <i>rubicundula</i>	Rank 1B.2	Chaparral (openings), cismontane woodland, meadows and seeps, valley and foothill grassland on serpentine. Elevation ranges from 65 to 2985 feet (20 to 910 meters). Blooms April to June.	<b>No Potential.</b> The Study Area lacks serpentine-derived soils associated with this species.	No further actions are recommended.
white-stemmed clarkia <i>Clarkia gracilis ssp. albicaulis</i>	Rank 1B.2	Chaparral, cismontane woodland/sometimes serpentine. Elevation ranges from 800 to 3560 feet (245 to 1085 meters). Blooms May to July.	<b>Unlikely.</b> Despite potentially suitable cismontane woodland habitat, the Study Area lacks chaparral, and serpentine-derived soils, and is below the documented elevation range of the species.	No further actions are recommended.
silky cryptantha <i>Cryptantha crinita</i>	Rank 1B.2	Cismontane woodland, lower montane coniferous forest, riparian forest, riparian woodland, valley and foothill grassland in gravelly streambeds. Elevation ranges from 200 to 3985 feet (61 to 1215 meters). Blooms April to May.	<b>High Potential.</b> The Study Area contains potentially suitable gravelly streambeds which could support this species. Additionally the nearest documented occurrence is less than 5 miles southeast of the Study Area along Singer Creek (CDFW 2018).	Protocol-level special-status plant surveys may be recommended to determine presence or absence of this species within impact areas, dependent on project specifics.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	CONCLUSIONS/ RECOMMENDATIONS
dwarf downingia <i>Downingia pusilla</i>	Rank 2B.2	Valley and foothill grassland (mesic), vernal pools. Elevation ranges from 0 to 1460 feet (1 to 445 meters). Blooms March to May.	<b>Moderate Potential.</b> The Study Area contains potentially suitable vernal pools and seasonal wetlands that could support this species.	Protocol-level special-status plant surveys may be recommended to determine presence or absence of this species within impact areas, dependent on project specifics.
shield-bracted monkeyflower <i>Erythranthe [Mimulus] glaucescens</i>	Rank 4.3	Chaparral, cismontane woodland, lower montane coniferous forest, valley and foothill grassland. Elevation ranges from 195 to 4070 feet (60 to 1240 meters). Blooms February to August (sometimes September).	<b>Present.</b> Approximately 10 individuals of this species were observed in seasonal wetland and mesic streambanks of Lower Deer Creek.	Protocol-level special-status plant surveys may be recommended to determine presence or absence of this species within impact areas, dependent on project specifics.
Hoover's spurge <i>Euphorbia hooveri</i>	FT, Rank 1B.2	Vernal pools. Elevation ranges from 80 to 820 feet (25 to 250 meters). Blooms July to September (occasionally October).	<b>High Potential.</b> Vernal pools in the Study Area could provide suitable habitat for this species. This species is documented to occur within vernal pools in the "Leininger Lakes" in the northern portion of the Study Area (CDFW 2018).	Protocol-level special-status plant surveys may be recommended to determine presence or absence of this species within impact areas, dependent on project specifics.
Stony Creek spurge <i>Euphorbia ocellata</i> <i>ssp. rattanii</i>	Rank 1B.2	Chaparral, riparian scrub (streambank), valley and foothill grassland (sandy or rocky). Elevation ranges from 210 to 2625 feet (65 to 800 meters). Blooms May to October.	<b>High Potential.</b> The Study Area contains potentially suitable riparian scrub, and valley and foothill grassland underlain by rocky soils. Additionally, the nearest documented occurrence is approximately 6 miles west-southwest (WSW) of the Study Area (CDFW 2018).	Protocol-level special-status plant surveys may be recommended to determine presence or absence of this species within impact areas, dependent on project specifics.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	CONCLUSIONS/ RECOMMENDATIONS
adobe-lily <i>Fritillaria pluriflora</i>	Rank 1B.2	Chaparral, cismontane woodland, valley and foothill grassland/often adobe. Elevation ranges from 200 to 2310 feet (60 to 705 meters). Blooms February to April.	<b>High Potential.</b> The Study Area contains potentially suitable clay soils known to support this species and this species is reported from within the Study Area approximately 200 yards east of Highway 99E and 100 yards north of deer creek (CDFW 2018).	Protocol-level special-status plant surveys may be recommended to determine presence or absence of this species within impact areas, dependent on project specifics.
Boggs Lake hedge-hyssop <i>Gratiola heterosepala</i>	SE, Rank 1B.2	Marshes and swamps (lake margins), vernal pools. Elevation ranges from 30 to 7790 feet (10 to 2375 meters). Blooms April to August.	<b>High Potential.</b> The Study Area contains potentially suitable vernal pool habitat which could support this species. Additionally, the nearest documented occurrence is less than 5 miles southeast of the Study Area on the Vina Plains Preserve (CDFW 2018).	Protocol-level special-status plant surveys may be recommended to determine presence or absence of this species within impact areas, dependent on project specifics.
hogwallow starfish <i>Hesperivax caulescens</i>	Rank 4.2	Valley and foothill grassland (mesic, clay), vernal pools (shallow)/sometimes alkaline. Elevation ranges from 0 to 1660 feet (0 to 505 meters). Blooms March to June.	<b>Present.</b> Approximately 100 individuals of this species were observed in mesic grasslands and vernal pool fringes in the northern portion of the Study Area.	Protocol-level special-status plant surveys may be recommended to determine presence or absence of this species within impact areas, dependent on project specifics.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	CONCLUSIONS/ RECOMMENDATIONS
Coulter's goldfields <i>Lasthenia glabrata</i> <i>ssp. coulteri</i>	Rank 1B.1	Marshes and swamps (coastal salt), playas, vernal pools. Elevation ranges from 0 to 4005 feet (1 to 1220 meters). Blooms February to June.	<b>High Potential.</b> The Study Area contains potentially suitable vernal pools and mesic grasslands which could support this species. Additionally, this species is documented from less than 5 miles southeast of the Study Area on the Vina Plains Preserve (CDFW 2018).	Protocol-level special-status plant surveys may be recommended to determine presence or absence of this species within impact areas, dependent on project specifics.
Legenere <i>Legenere limosa</i>	Rank 1B.1	Vernal pools. Elevation ranges from 0 to 2885 feet (1 to 880 meters). Blooms April to June.	<b>Moderate Potential.</b> The Study Area contains potentially suitable vernal pool habitat which could support this species.	Protocol-level special-status plant surveys may be recommended to determine presence or absence of this species within impact areas, dependent on project specifics.
Butte County meadowfoam <i>Limnanthes floccosa</i> <i>ssp. californica</i>	FE, SE, Rank 1B.1	Valley and foothill grassland (mesic), vernal pools. Elevation ranges from 150 to 3050 feet (46 to 930 meters). Blooms March to May.	<b>Moderate Potential.</b> The Study Area contains potentially suitable vernal pools and mesic grasslands which could support this species.	Protocol-level special-status plant surveys may be recommended to determine presence or absence of this species within impact areas, dependent on project specifics.
woolly meadowfoam <i>Limnanthes floccosa</i> <i>ssp. floccosa</i>	Rank 4.2	Chaparral, cismontane woodland, valley and foothill grassland, vernal pools/vernally mesic. Elevation ranges from 200 to 4380 feet (60 to 1335 meters). Blooms March to May (occasionally June).	<b>High Potential.</b> Vernal pools and vernally mesic grassland in the Study Area provide potential habitat for this species and it has been previously documented within 6 miles of the Study Area (CDFW 2018).	Protocol-level special-status plant surveys may be recommended to determine presence or absence of this species within impact areas, dependent on project specifics.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	CONCLUSIONS/ RECOMMENDATIONS
Tehama navarretia <i>Navarretia heterandra</i>	Rank 4.3	Valley and foothill grassland (mesic), vernal pools. Elevation ranges from 100 to 3310 feet (30 to 1010 meters). Blooms April to June.	<b>High Potential.</b> Vernal pools and vernal mesic grassland in the Study Area provide potential habitat for this species and it has been previously documented within 5 miles of the Study Area on the Vina Plains Preserve (CCH 2018).	Protocol-level special-status plant surveys may be recommended to determine presence or absence of this species within impact areas, dependent on project specifics.
Baker's navarretia <i>Navarretia leucophala</i> ssp. <i>bakeri</i>	Rank 1B.1	Cismontane woodland, lower montane coniferous forest, meadows and seeps, valley and foothill grassland, vernal pools. Elevation ranges from 15 to 5710 feet (5 to 1740 meters). Blooms April to July.	<b>Moderate Potential.</b> The Study Area contains potentially suitable vernal pool, and mesic grassland habitats which could support this species. The non-rare <i>N. l.</i> ssp. <i>leucophala</i> was observed in vernal pools in the Study Area.	Protocol-level special-status plant surveys may be recommended to determine presence or absence of this species within impact areas, dependent on project specifics.
adobe navarretia <i>Navarretia nigelliformis</i> ssp. <i>nigelliformis</i>	Rank 4.2	Valley and foothill grassland (vernally mesic), vernal pools (sometimes clay, sometimes serpentine). Elevation ranges from 330 to 3280 feet (100 to 1000 meters). Blooms April to June.	<b>Moderate Potential.</b> The Study Area contains potentially suitable vernal pools and mesic grassland habitats underlain by clay soils which could support this species.	Protocol-level special-status plant surveys may be recommended to determine presence or absence of this species within impact areas, dependent on project specifics.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	CONCLUSIONS/ RECOMMENDATIONS
hairy Orcutt grass <i>Orcuttia pilosa</i>	FE, SE, Rank 1B.1	Vernal pools. Elevation ranges from 150 to 660 feet (46 to 200 meters). Blooms May to September.	<b>High Potential.</b> Vernal pools in the Study Area provide suitable habitat for this species. This species has been documented in the large vernal pool complex known as “Leininger Lakes” in the northern portion of the Study Area (CDFW 2018).	Protocol-level special-status plant surveys may be recommended to determine presence or absence of this species within impact areas, dependent on project specifics.
slender Orcutt grass <i>Orcuttia tenuis</i>	FT, SE, Rank 1B.1	Vernal pools. Elevation ranges from 110 to 5775 feet (35 to 1760 meters). Blooms May to September (sometimes October).	<b>High Potential.</b> The Study Area contains potentially suitable vernal pool habitat and this species is documented from less than 5 miles southeast on the Vina Plains Preserve (CDFW 2018).	Protocol-level special-status plant surveys may be recommended to determine presence or absence of this species within impact areas, dependent on project specifics.
Ahart's paronychia <i>Paronychia ahartii</i>	Rank 1B.1	Cismontane woodland, valley and foothill grassland, vernal pools. Elevation ranges from 100 to 1670 feet (30 to 510 meters). Blooms February to June.	<b>High Potential.</b> Vernal pools in the Study Area provide suitable habitat for this species. This species has been documented in the large vernal pool complex known as “Leininger Lakes” in the northern portion of the Study Area (CDFW 2018).	Protocol-level special-status plant surveys may be recommended to determine presence or absence of this species within impact areas, dependent on project specifics.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	CONCLUSIONS/ RECOMMENDATIONS
Bidwell's knotweed <i>Polygonum bidwelliae</i>	Rank 4.3	Chaparral, cismontane woodland, valley and foothill grassland/volcanic. Elevation ranges from 200 to 3940 feet (60 to 1200 meters). Blooms April to July.	<b>High Potential.</b> Grasslands with volcanically derived soils in the Study Area provide potential habitat for this species.	Protocol-level special-status plant surveys may be recommended to determine presence or absence of this species within impact areas, dependent on project specifics.
Sanford's arrowhead <i>Sagittaria sanfordii</i>	Rank 1B.2	Marshes and swamps (assorted shallow freshwater). Elevation ranges from 0 to 2135 feet (0 to 650 meters). Blooms May to October (sometimes November).	<b>Moderate Potential.</b> The Study Area contains potentially suitable freshwater marsh habitat which could support this species.	Protocol-level special-status plant surveys may be recommended to determine presence or absence of this species within impact areas, dependent on project specifics.
Greene's tuctoria <i>Tuctoria greenei</i>	FE, SR, Rank 1B.1	Vernal pools. Elevation ranges from 100 to 3510 feet (30 to 1070 meters). Blooms May to July (occasionally September).	<b>High Potential.</b> Vernal pools in the Study Area provide suitable habitat for this species. This species has been documented in the large vernal pool complex known as "Leininger Lakes" in the northern portion of the Study Area (CDFW 2018).	Protocol-level special-status plant surveys may be recommended to determine presence or absence of this species within impact areas, dependent on project specifics.
<b>Mammals</b>				

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	CONCLUSIONS/ RECOMMENDATIONS
<p>pallid bat <i>Antrozous pallidus</i></p>	<p>SSC, WBWG High</p>	<p>Found in a variety of habitats ranging from grasslands to mixed forests, favoring open and dry, rocky areas. Roost sites include crevices in rock outcrops and cliffs, caves, mines, and also hollow trees and various manmade structures such as bridges, barns, and buildings (including occupied buildings).  Roosts must protect bats from high temperatures. Very sensitive to disturbance of roosting sites.</p>	<p><b>High Potential.</b> Bridges and larger tree hollows/cavities within the Study Area provide suitable roost sites. There are three CNDBB occurrences for this species within 10 miles of the Study Area, all located to the north and in affiliation with riparian trees (CDFW 2018).</p>	<p>If tree removal occurs from April 1 to September 30 (during the bat maternity roost season), a detailed habitat assessment of focal trees and potentially pre-construction surveys should occur; active roosts should be avoided.</p>
<p>Townsend's big-eared bat <i>Corynorhinus townsendii</i></p>	<p>SSC, WBWG High</p>	<p>Associated with a wide variety of habitats from deserts to higher- elevation mixed and coniferous forests. Females form maternity colonies in buildings, caves and mines, and males roost singly or in small groups. Foraging typically occurs at edge habitats near wooded areas, e.g. along streams.</p>	<p><b>Unlikely.</b> The Study Area appears to lack typical roost sites such as caves, mines or suitable buildings. May forage within the Study Area. There are three CNDBB occurrences for this species within 10 miles of the Study Area, all located to the north and in affiliation with riparian trees (CDFW 2018); presumably these occurrences represent foraging individuals.</p>	<p>No further actions are recommended.</p>

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	CONCLUSIONS/ RECOMMENDATIONS
western mastiff bat <i>Eumops perotis</i>	SSC, WBWG High	Found in a wide variety of open, arid and semi-arid habitats. Distribution appears to be tied to large rock structures which provide suitable roosting sites, including cliff crevices and cracks in boulders.	<b>Unlikely.</b> The Study Area lacks typical roost substrates such as rock piles, boulders, and cliffs May forage within the Study Area. The nearest documented CNDD occurrence with a specific location is located approximately 2.7 miles to the west, and presumably represents foraging by the species (CDFW 2018).	No further actions are recommended.
silver-haired bat <i>Lasionycteris noctivagans</i>	WBWG Medium	Primarily a forest dweller (coniferous and mixed), feeding over open areas, including streams. Roosts primarily in tree hollows and snags, as well as under bark. Found in lower elevation and drier areas during migration and winter.	<b>Unlikely.</b> Forest cover within the Study Area is limited to riparian areas that are relatively small in contiguous area. The nearest documented CNDD occurrence with a specific location is located approximately 2.7 miles to the west, and presumably represents foraging by the species outside of the maternity season (CDFW 2018).	No further actions are recommended.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	CONCLUSIONS/ RECOMMENDATIONS
western red bat <i>Lasiurus blossevillii</i>	SSC, WBWG High	Highly migratory and typically solitary, roosting primarily in the foliage of trees or shrubs. Associated with broad-leaved tree species including cottonwoods, sycamores, alders, and maples. Day roosts are commonly in edge habitats adjacent to streams, open fields or orchards. Considered to be highly migratory.	<b>High Potential.</b> The Study Area provides riparian broad-leaved trees for roosting and a variety of edge habitats for foraging. There are several	If tree removal occurs from April 1 to September 30 (during the bat maternity roost season), a detailed habitat assessment of focal trees and potentially pre-construction surveys should occur; active roosts should be avoided.
hoary bat <i>Lasiurus cinereus</i>	WBWG Medium	Highly associated with forested habitats that feature access to open areas or habitat edges for feeding. Roosts in dense foliage of medium to large trees, usually near the ends of branches. Feeds primarily on moths. Requires water. Considered to be highly migratory.	<b>Unlikely.</b> Forest cover within the Study Area is limited to riparian areas that are relatively small in contiguous area. CNNDB occurrences within 10 miles are in association with riparian trees (CDFW 2018), but presumably represent migrating (or wintering) individuals.	No further actions are recommended.
long-eared myotis <i>Myotis evotis</i>	WBWG Medium	Typically associated with coniferous forests (from low- to high-elevation); also occurs in semi-arid shrublands, chaparral, and agricultural areas. Roost substrates variable, and include under exfoliating tree bark, trees hollows, caves, mines, rock outcrops, as well as buildings and under bridges.	<b>Moderate Potential.</b> The Study Area provides suitable roost sites including tree hollows and bridges.	If tree removal occurs from April 1 to September 30 (during the bat maternity roost season), a detailed habitat assessment of focal trees and potentially pre-construction surveys should occur; active roosts should be avoided.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	CONCLUSIONS/ RECOMMENDATIONS
American badger <i>Taxidea taxus</i>	SSC	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils. Requires friable soils and open, uncultivated ground. Preys on burrowing rodents.	<b>Unlikely.</b> No badger- sized burrows or analogous potential refugia were observed within the Study Area during the site visit; no CNDDDB occurrences in the vicinity (CDFW 2018).	No further actions are recommended.
<b>Birds</b>				
tricolored blackbird <i>Agelaius tricolor</i>	ST, SSC, BCC	Nearly endemic to California, where it is most numerous in the Central Valley and vicinity. Highly colonial, nesting in dense aggregations over or near freshwater in emergent growth or riparian thickets. Also uses flooded agricultural fields. Abundant insect prey near breeding areas essential.	<b>Present.</b> Tricolored blackbirds, including singing males, were observed at two locations within the Study Area during the site visit; both locations provide suitable nesting habitat.	If ground disturbance or vegetation removal occurs during the nesting bird season (Feb. 1 to Aug. 31), a pre-construction nesting bird survey should be conducted and active nest sites avoided. Riparian and floodplain restoration are anticipated to benefit this species, especially if areas of freshwater marsh are created and/or enlarged.
grasshopper sparrow <i>Ammodramus savannarum</i>	SSC	Summer resident. Breeds in open grasslands, generally with low- to moderate-height grasses and scattered shrubs. Well-hidden nests are placed on the ground.	<b>Moderate Potential.</b> Grassland within the Study Area provides suitable nesting habitat for this species.	If ground disturbance or vegetation removal occurs during the nesting bird season (Feb. 1 to Aug. 31), a pre-construction nesting bird survey should be conducted and active nest sites avoided.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	CONCLUSIONS/ RECOMMENDATIONS
great egret <i>Ardea alba</i>	none (breeding sites protected by CDFW)	Year-round resident. Nests colonially or semi-colonially, usually in trees, occasionally on the ground or elevated platforms. Breeding sites usually in close proximity to foraging areas: marshes, lake margins, tidal flats, and rivers. Forages primarily on fishes and other aquatic prey, also smaller terrestrial vertebrates.	<b>Moderate Potential (nesting).</b> Riparian trees within the Study Area provide suitable nesting substrates for this species. Individuals were observed within the Study Area during the site visit; no indication of nesting was observed.	If tree removal or trimming occurs during the nesting bird season (Feb. 1 to Aug. 31), a pre-construction nesting bird survey should be conducted and active nest sites avoided. If known nest sites (e.g., trees) must be impacted, CDFW should be consulted.
great blue heron <i>Ardea herodias</i>	none (breeding sites protected by CDFW)	Year-round resident. Nests colonially or semi-colonially in tall trees and on cliffs, also sequestered terrestrial substrates. Breeding sites usually in close proximity to foraging areas: marshes, lake margins, tidal flats, and rivers. Forages primarily on fishes and other aquatic prey, also smaller terrestrial vertebrates.	<b>Present (nesting).</b> A nesting colony within riparian trees along Deer Creek has been previously documented (CDFW 2018), and was observed to remain active by WRA during the site visit.	If tree removal or trimming occurs during the nesting bird season (Feb. 1 to Aug. 31), a pre-construction nesting bird survey should be conducted and active nest sites avoided. If known nest sites (e.g., trees) must be impacted, CDFW should be consulted.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	CONCLUSIONS/ RECOMMENDATIONS
short-eared owl <i>Asio flammeus</i>	SSC	Occurs year-round, but primarily as a winter visitor; breeding very restricted in most of California. Found in open, treeless areas (e.g., marshes, grasslands) with elevated sites for foraging perches and dense herbaceous vegetation for roosting and nesting. Preys mostly on small mammals, particularly voles.	<b>Unlikely.</b> The Study Area is outside of this species known current breeding range (Shuford and Gardali 2008); may rarely occur during the non-breeding season.	No further actions are recommended.
long-eared owl <i>Asio otus</i>	SSC	Occurs year-round in California. Nests in trees in a variety of woodland habitats, including oak and riparian, as well as tree groves. Requires adjacent open land with rodents for foraging, and the presence of old nests of larger birds (hawks, crows, magpies) for breeding.	<b>Unlikely.</b> The Study Area is outside of this species known current breeding range (Shuford and Gardali 2008); may rarely occur during the non-breeding season in affiliation with riparian groves.	No further actions are recommended.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	CONCLUSIONS/ RECOMMENDATIONS
burrowing owl <i>Athene cunicularia</i>	SSC, BCC	Year-round resident and winter visitor. Occurs in open grasslands and scrub habitats with low- growing vegetation, perches and abundant mammal burrows. Preys upon insects and small vertebrates. Nests and roosts in old mammal burrows, most commonly those of ground squirrels.	<b>Moderate Potential.</b> Open grassland within the Study Area provides suitable year- round habitat for this species. The nearest breeding occurrences in CNDDDB are located a minimum distance of 10.0 miles northwest of the Study Area (CDFW 2018); several wintering owls have been observed in recent years (2016- 2018) along Leninger and Lassen Roads within 3.0 miles south of the Study Area (eBird 2018). Ground squirrels and their burrows were observed during the site visit.	Pre-construction surveys should be performed in areas of suitable habitat if work occurs during the greater nesting season (Feb. 1 – August 31); occupied burrows should be avoided, and impacts to such burrows (including those used only for wintering) and adjacent habitat may require compensatory mitigation.
oak titmouse <i>Baeolophus inornatus</i>	BCC	Occurs year-round in woodland and savannah habitats where oaks are present, as well as riparian areas. Nests in tree cavities.	<b>Present.</b> Oaks and riparian trees provide year-round habitat within the Study Area; this species was observed at several locations during the site visit.	If tree removal or trimming occurs during the nesting bird season (Feb. 1 to Aug. 31), a pre-construction nesting bird survey should be conducted and active nest sites avoided.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	CONCLUSIONS/ RECOMMENDATIONS
Swainson's hawk <i>Buteo swainsoni</i>	ST, BCC	Summer resident in California's Central Valley. Nests in tree groves and isolated trees in riparian and agricultural areas, including near buildings. Forages in grasslands and scrub habitats as well as agricultural fields, especially alfalfa. Preys on arthropods year-round as well as smaller vertebrates during the breeding season.	<b>High Potential.</b> The Study Area contains numerous trees that are suitable for nesting, as well as foraging habitat, particularly in pastureland north of Deer Creek. The nearest documented nesting occurrence in CNDDDB is located approximately 1.2 miles northwest of the Study Area (CDFW 2018). No Swainson's hawks were observed within the Study Area during the site visit.	Pre-construction nesting bird surveys and avoidance of active nests, if vegetation removal and/or ground disturbance occurs during the nesting bird season.
northern harrier <i>Circus cyaneus</i>	SSC	Year-round resident and winter visitor. Found in open habitats including grasslands, prairies, marshes and agricultural areas. Nests on the ground in dense vegetation, typically near water or otherwise moist areas. Preys on small vertebrates.	<b>Present.</b> One northern harrier was observed foraging within the Study Area (grassland) during the site visit. Open portions of the Study Area (grasslands and wetland areas) provide suitable nesting habitat.	If tree removal or trimming occurs during the nesting bird season (Feb. 1 to Aug. 31), a pre-construction nesting bird survey should be conducted and active nest sites avoided.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	CONCLUSIONS/ RECOMMENDATIONS
western yellow-billed cuckoo <i>Coccyzus americanus occidentalis</i>	FT, SE, BCC	Summer resident, breeding in dense riparian forests and jungles, typically with early successional vegetation present. Utilizes densely-foliaged deciduous trees and shrubs. Eats mostly caterpillars. Current breeding distribution within California very restricted.	<b>Unlikely (nesting).</b> Riparian forest within the Study Area is restricted largely to strips along Deer Creek and other areas, and likely too small in area to support nesting by this species. There are five occurrences in CNDDDB within 5 miles, all in association with large tracts of riparian forest along the Sacramento River; the nearest of these is located near the mouth of Deer Creek (CDFW 2018).	No further actions are recommended. Riparian and floodplain restoration are anticipated to benefit this species, especially if areas of contiguous riparian forest are increased in size.
white-tailed kite <i>Elanus leucurus</i>	CFP	Year-round resident in coastal and valley lowlands with scattered trees and large shrubs, including grasslands, marshes and agricultural areas. Nests in trees, of which the type and setting are highly variable. Preys on small mammals and other vertebrates.	<b>Moderate Potential.</b> The Study Area provides open grassland for foraging and trees for nesting. The nearest documented nesting occurrence in CNDDDB is located over 10 miles to the northwest (CDFW 2018); there are observations within 2 miles in eBird (2018).	Pre-construction nesting bird surveys and avoidance of active nests, if vegetation removal and/or ground disturbance occurs during the nesting bird season.
prairie falcon <i>Falco mexicanus</i>	BCC	Year-round resident and winter visitor. Inhabits dry, open terrains, including foothills and valleys. Breeding sites located on steep cliffs. Forages widely.	<b>Unlikely.</b> The Study Area does not contain steep cliffs for nesting. May forage in the area, mostly likely during the non-breeding season.	No further actions are recommended.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	CONCLUSIONS/ RECOMMENDATIONS
bald eagle <i>Haliaeetus leucocephalus</i>	FD, SE, CFP, BCC	Occurs year-round in California, but primarily a winter visitor in the Central Valley. Nests in large trees in the vicinity of larger lakes, reservoirs and rivers. Wintering habitat somewhat more variable but usually features large concentrations of waterfowl or fish.	<b>Unlikely (nesting).</b> The Deer Creek mainstem within the Study Area provides some suitable habitat elements for breeding, but is unlikely to be used given higher-quality habitat in the vicinity. Bald eagles may roost or forage within the Study Area outside of the breeding season. Recent observations during the breeding season (2014-2018) suggest that the nearest nesting location is along the Sacramento River approximately 2.5 miles southwest of the Study Area (eBird 2018).	No further actions are recommended.
yellow-breasted chat <i>Icteria virens</i>	SSC	Summer resident, occurring in riparian areas with an open canopy, very dense understory, and trees for song perches. Typically nests in thickets of willow, blackberry, and/or wild grape.	<b>Moderate Potential.</b> Riparian woodland within the Study Area features areas with a relatively open overstory and dense understory that is suitable for nesting. There are recent observations of this species within 5 miles (eBird 2018).	If tree removal or trimming occurs during the nesting bird season (Feb. 1 to Aug. 31), a pre-construction nesting bird survey should be conducted and active nest sites avoided. Riparian and floodplain restoration are anticipated to benefit this species.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	CONCLUSIONS/ RECOMMENDATIONS
loggerhead shrike <i>Lanius ludovicianus</i>	SSC, BCC	Year-round resident in open woodland, grassland, savannah and scrub. Prefers areas with sparse shrubs, trees, posts, and other suitable perches for foraging. Preys upon large insects and small vertebrates. Nests are well-concealed in densely-foliaged shrubs or trees.	<b>Moderate Potential.</b> The Study Area provides open grassland areas and pastures with scattered trees and shrubs, as well as pastures fences and other perches. There are observations of this species within 5 miles (eBird 2016).	If tree removal or trimming occurs during the nesting bird season (Feb. 1 to Aug. 31), a pre-construction nesting bird survey should be conducted and active nest sites avoided.
yellow-billed magpie <i>Pica nuttalli</i>	BCC	Endemic to the Central Valley and central Coast Ranges. Favors open park-like areas with expanses of open ground, including oak savannah, orchards, and along stream courses. Large, spherical stick nests are placed in trees.	<b>Moderate Potential.</b> The Study Area provides open areas for foraging and trees (including orchards) for nesting. There are observations of this species within 5 miles (eBird 2018).	If tree removal or trimming occurs during the nesting bird season (Feb. 1 to Aug. 31), a pre-construction nesting bird survey should be conducted and active nest sites avoided.
Nuttall's woodpecker <i>Picoides nuttallii</i>	BCC	Year-round resident in lowland woodlands throughout much of California west of the Sierra Nevada. Typical habitat is dominated by oaks; also occurs in riparian woodland. Nests in tree cavities.	<b>Present.</b> Oaks and riparian trees provide year-round habitat within the Study Area; this species was observed at several locations during the site visit.	If tree removal or trimming occurs during the nesting bird season (Feb. 1 to Aug. 31), a pre-construction nesting bird survey should be conducted and active nest sites avoided.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	CONCLUSIONS/ RECOMMENDATIONS
<p>bank swallow <i>Riparia riparia</i></p>	<p>ST</p>	<p>Summer resident in riparian and other lowland habitats near rivers, lakes and the ocean in northern California. Nests colonially in excavated burrows on vertical cliffs and bank cuts (natural and manmade) with fine-textured soils. Historical nesting range in southern and central areas of California has been eliminated by habitat loss. Currently known to breed in Siskiyou, Shasta, and Lassen Cos., portions of the north coast, and along Sacramento River from Shasta Co. south to Yolo Co.</p>	<p><b>Unlikely.</b> Potential nesting habitat (cut or eroded banks) within the Study Area is marginal; all recent documented nesting occurrences in the general vicinity are in direct association with the Sacramento River (CDFW 2018).</p>	<p>No further actions are recommended.</p>
<p>yellow warbler <i>Setophaga (Dendroica) petechia brewsteri</i></p>	<p>SSC, BCC</p>	<p>Summer resident throughout much of California. Breeds in riparian vegetation close to water, including streams and wet meadows. Microhabitat used for nesting variable, but dense willow growth is typical. Occurs widely on migration.</p>	<p><b>Unlikely (nesting).</b> While the riparian habitat within the Study Area is ostensibly suitable for nesting, this species is essentially extirpated as a breeder in the Sacramento Valley (Shuford and Gardali 2008). Presumably present during migration.</p>	<p>No further actions are recommended; riparian and floodplain restoration are anticipated to benefit this species.</p>

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	CONCLUSIONS/ RECOMMENDATIONS
<p>least bell's vireo <i>Vireo bellii pusillus</i></p>	<p>FE, SE</p>	<p>Summer resident, though nearly entirely extirpated in northern California. Breeds in riparian habitat along perennial or intermittent rivers and creeks; prefers a multi-tiered canopy with dense early successional vegetation in the understory. Willows, mulefat and other understory species are typically used for nesting.</p>	<p><b>Unlikely.</b> Riparian habitat along/adjacent to some portions of Deer Creek and associated sloughs provides suitable nesting habitat. However, this species is generally considered extirpated in the region; the nearest historic nesting occurrences in CNDDDB are located approximately 5.5 and 6.0 miles to the north, and date from 1924 and 1912 respectively (CDFW 2018).</p>	<p>No further actions are recommended; riparian and floodplain restoration are anticipated to benefit this species and may contribute to its recovery within the Sacramento Valley.</p>
<p><b>Reptiles and Amphibians</b></p>				
<p>western pond turtle <i>Actinemys marmorata</i></p>	<p>SSC</p>	<p>A thoroughly aquatic turtle of ponds, marshes, rivers, streams and irrigation ditches with aquatic vegetation. Require basking sites such as partially submerged logs, vegetation mats, or open mud banks, and suitable upland habitat (sandy banks or grassy open fields) for egg-laying.</p>	<p><b>Present.</b> Deer Creek, associated sloughs and backwaters, and other aquatic features within the Study Area provide suitable aquatic habitat, and nearby terrestrial areas appear suitable for nesting in many cases. The species is previously documented within Deer Creek (CDFW 2018), and was observed by WRA during the site visit.</p>	<p>Riparian and floodplain restoration will presumably be of ultimate benefit to this species. In addition to in-water work restrictions, relevant avoidance measures may include spatial/seasonal restrictions for work in potential nesting habitat, pre-construction surveys, and exclusionary fencing.</p>

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	CONCLUSIONS/ RECOMMENDATIONS
coast (Blainville's) horned lizard <i>Phrynosoma blainvillii</i> ( <i>coronatum</i> )	SSC	Frequents a wide variety of habitats, most common in lowlands along sandy washes with scattered low bushes. Prefers friable, rocky, or shallow sandy soils for burial; open areas for sunning; bushes for cover; and an abundant supply of ants and other insects.	<b>Unlikely.</b> The Study Area is within the presumed range of this species, but generally lacks sandy soils and associated habitat elements.	No further actions are recommended.
foothill yellow-legged frog <i>Rana boylei</i>	SSC	Occurs within or in direction association with rocky streams in a variety of habitats; highly aquatic. Prefers partly-shaded, shallow streams and riffles with a rocky substrate; requires at least some cobble-sized substrate for egg-laying. Needs at least 15 weeks to attain metamorphosis. Feeds on both aquatic and terrestrial invertebrates.	<b>Unlikely.</b> Lower Deer Creek provides some suitable habitat elements, although the flow regime may be unfavorable to breeding. This species is known from the upper reaches of Deer Creek; the nearest documented occurrences in CNDDDB on the Sacramento Valley floor are historic, dating from 1912 and 1924 (CDFW 2018).	No further actions are recommended.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	CONCLUSIONS/ RECOMMENDATIONS
western spadefoot <i>Spea hammondi</i>	SSC	Occurs primarily in grasslands, but can be found in woodlands, scrublands, and other habitats. Aquatic breeding occurs in shallow temporary pools formed by winter rains. Most of non- breeding period spent underground in burrows.	<b>High Potential.</b> Vernal pools within the Study Area provide potential breeding habitat, with gopher burrows and friable soil also present. There are recent documented occurrences within 4.4 miles to the north, at a similar elevation range to that of the Study Area (CDFW 2018).	Seasonal water features should be avoided to the fullest extent feasible; if impacts to these features are necessary, presence/absence surveys should be performed prior to impacts (e.g., when pools are filled and likely to be utilized). If present, consultation with CDFW (e.g., as to avoidance measures) may be required.
<b>Fishes</b>				
Pacific lamprey <i>Entosphenus tridentatus</i>	SSC	Anadromous. Spawns between March and July in gravel bottomed streams in riffle habitat. Larvae drift downstream to areas of low velocity and fine substrates and are relatively immobile in the stream substrates.	<b>Present.</b> A population of this species is present in Deer Creek (CDFW 2017).	Avoidance measures associated with salmonids will presumably cover this species as well.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	CONCLUSIONS/ RECOMMENDATIONS
steelhead - Central Valley DPS <i>Oncorhynchus mykiss irideus</i>	FT	The Central Valley DPS includes all naturally spawned populations (and their progeny) in the Sacramento and San Joaquin Rivers and their tributaries, excluding San Francisco and San Pablo Bays and their tributaries. Preferred spawning habitat is in cool to cold perennial streams with high dissolved oxygen levels and fast flowing water. Abundant riffle areas for spawning, and deeper pools with sufficient riparian cover for rearing, are necessary for successful breeding.	<b>Present.</b> A steelhead population is present in Deer Creek (CDFW 2017); at a minimum, lower Deer Creek within the Study Area is used for in- and out- migration.	If in-stream work is necessary, such work will likely be restricted to June 1 – October 31, and consultation with NMFS and CDFW will presumably be required.
Chinook salmon - Sacramento River winter-run ESU <i>Oncorhynchus tshawytscha</i>	FE, SE	Occurs in the Sacramento River below Keswick Dam; spawning currently restricted to the Sacramento River mainstem. Requires clean, cold water over gravel beds with water temperatures between 6 and 14 degrees C for spawning. Adults migrate upstream to spawn in cool, clear, well-oxygenated streams. Juveniles typically migrate to the ocean soon after emergence from the gravel.	<b>Unlikely.</b> This Chinook salmon ESU is not known to spawn in tributaries of the Sacramento River; may occasionally stray into lower Deer Creek within the Study Area.	No further actions are recommended.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	CONCLUSIONS/ RECOMMENDATIONS
Chinook salmon - Central Valley spring- run ESU <i>Oncorhynchus tshawytscha</i>	FT, ST	Occurs in the Feather River and the Sacramento River and its tributaries, including Butte, Mill, Deer, Antelope and Beegum Creeks. Adults enter the Sacramento River from late March through September. Adults migrate upstream to spawn in cool, clear, well-oxygenated streams from mid-August through early October. Juveniles migrate soon after emergence as young- of-the-year, or remain in freshwater and migrate as yearlings.	<b>Present.</b> Deer Creek is one of three streams that supports a self- sustaining, wild population of this Chinook salmon ESU (CDFW 2017). Lower Deer Creek within the Study Area is used for in- and out-migration. The Deer Creek mainstem is also critical habitat for this species.	If in-stream work is necessary, such work will likely be restricted to June 1 – October 31, and consultation with NMFS and CDFW will presumably be required.
Chinook salmon - central valley fall/late fall-run ESU <i>Oncorhynchus tshawytscha</i>	SSC	Populations spawning in the Sacramento and San Joaquin Rivers and their tributaries. Adults migrate upstream to spawn in cool, clear, well-oxygenated streams. Juveniles remain in fresh water for 1 or more years before migrating downstream to the ocean.	<b>Present.</b> Deer Creek supports populations of this ESU (CDFW 2017). Lower Deer Creek within the Study Area is used for in- and out-migration. The Deer Creek mainstem is also critical habitat for this species.	If in-stream work is necessary, such work will likely be restricted to June 1 – October 31, and consultation with CDFW will presumably be required.
<b>Invertebrates</b>				

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	CONCLUSIONS/ RECOMMENDATIONS
Conservancy fairy shrimp <i>Branchinecta conservatio</i>	FE	Endemic to the grasslands of the northern two-thirds of the Central Valley; typically found in large, turbid seasonal pools (e.g., “playa pools”). Occupied pools often located in swales formed by old, braided alluvium; and filled by winter/spring rains.	<b>Moderate Potential.</b> Generally, potentially suitable habitat for this species appears restricted to grasslands in the northwestern portion of the Study Area, where longer-lasting vernal pools may be present. The nearest occurrence in CNDDDB is located approximately 0.1 mile to the north (CDFW 2018).	Seasonal water features should be avoided to the fullest extent feasible; protocol-level surveys should be conducted for any potentially occupied pools that may be impacted.  Consultation with the USFWS will presumably be required for any impacts to occupied pools, and compensatory mitigation likely required.
vernal pool fairy shrimp <i>Branchinecta lynchi</i>	FT	Endemic to the grasslands of the Central Valley, and central and southern Coast Ranges. Occupies seasonal rain-filled pools. Usually occurs in small, clear-water sandstone-depression pools and grassed swale, earth slump, or basalt-flow depression pools.	<b>High Potential.</b> Vernal pools within the Study Area appear to be relatively small and shorter-lived. There are several documented occurrences at a similar elevation range within 5.0 miles to the north (CDFW 2016).	Seasonal water features should be avoided to the fullest extent feasible; protocol-level surveys should be conducted for any potentially occupied pools that may be impacted.  Consultation with the USFWS will presumably be required for any impacts to occupied pools, and compensatory mitigation likely required.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	CONCLUSIONS/ RECOMMENDATIONS
valley elderberry longhorn beetle <i>Desmocerus californicus dimorphus</i>	FT	Occurs only in California's Central Valley, in association with blue elderberry ( <i>Sambucus</i> spp.). Prefers to lay eggs in elderberry 2 to 8 inches in diameter; some preference shown for "stressed" elderberry.	<b>Present.</b> There is an occurrence of this species in CNDDDB within the Study Area, i.e. along Deer Creek near Highway 99 (CDFW 2018). Larger elderberry shrubs within the Study Area are suitable for occupation by this species.	Elderberry shrubs should be avoided to the extent feasible. If avoidance is not possible; a qualified biologist should survey all elderberries to be impacted to determine presence/absence of the species. If present, consultation with the USFWS would be necessary.

**\* Key to status codes:**

BCC	U.S. Fish & Wildlife Service (USFWS) Birds of Conservation Concern
CFP	California Department of Fish and Wildlife (CDFW) Fully Protected Animal
FC	Federal Candidate
FE	Federal Endangered
FT	Federal Threatened
SE	State Endangered
SC	State Candidate
SSC	California Department of Fish and Wildlife (CDFW) Species of Special Concern
ST	State Threatened
Rank 1A	California Native Plant Society (CNPS) Rank 1A: Plants presumed extirpated in California and rare or extinct elsewhere
Rank 1B.1	California Native Plant Society (CNPS) Rank 1B.1: Plants rare, threatened or endangered in California and elsewhere (seriously threatened in California)
Rank 1B.2	California Native Plant Society (CNPS) Rank 1B.2: Plants rare, threatened, or endangered in California and elsewhere (moderately threatened in California)
Rank 2B.2	California Native Plant Society (CNPS) Rank 2B.2: Plants rare, threatened, or endangered in California, but more common elsewhere (moderately threatened in California)
Rank 4.3	California Rare Plant Rank 4.3: Plants of Limited Distribution - A Watch List (not very threatened in California) WBWG Western Bat Working Group High or Medium Priority Species

**\*\*Potential species occurrence definitions:**

Present. Species was observed on the site during site visits or has been recorded (i.e. CNDDDB, other reports) on the site recently.

High Potential. All of the habitat components meeting the species requirements are present and/or most of the habitat on or adjacent to the site is highly suitable. The species has a high probability of being found on the site.

Moderate Potential. Some of the habitat components meeting the species requirements are present, and/or only some of the habitat on or adjacent to the site is unsuitable. The species has a moderate probability of being found on the site.

Unlikely. Few of the habitat components meeting the species requirements are present, and/or the majority of habitat on and adjacent to the site is unsuitable or of very poor quality. The species has a low probability of being found on the site.

No Potential. Habitat on and adjacent to the site is clearly unsuitable for the species requirements (foraging, breeding, cover, substrate, elevation, hydrology, plant community, site history, disturbance regime).

**APPENDIX D: REPRESENTATIVE PHOTOGRAPH**

**Photo 1.** Perennial stream (lower Deer Creek) within the Study Area, with riparian woodland in the background.



**Photo 2.** Expansive freshwater marsh within the lower Deer Creek riparian corridor. Two special-status wildlife species were observed within this marsh, tricolored blackbird (*Agelaius tricolor*) and western pond turtle (*Actinemys marmorata*).



**Photo 3.** An inundated vernal swale adjacent to and directly north of the lower Deer Creek riparian corridor.



**Photo 4.** Agricultural canal north of lower Deer Creek.



**Photo 5.** Shield-bracted monkeyflower (*Erythranthe [Mimulus] glaucescens*), a special-status plantspecies observed in seasonal wetlands and on stream banks of lower Deer Creek.



**Photo 6.** A typical agricultural field adjacent to lower Deer Creek within the Study Area.

