

REVISED
SURVEY FOR SPECIAL-STATUS
VASCULAR PLANT SPECIES

For the proposed

Deer Creek Irrigation District Fish Passage Improvement Project
Tehama County, California

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Deer Creek DCID Dam Fish Passage Project
Tehama County, California

T25N, R1W, NW1/4 Sec. 23, NE1/4 Sec. 22 of the Acorn Hollow 7.5' USGS Topographic Quadrangle &
T25N, R1W, E1/2 Sec. 27 of the Richardson Springs NW 7.5' USGS Topographic Quadrangle

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I. Executive Summary

A survey for special-status vascular plant species was conducted at the proposed Deer Creek DCID Dam Fish Passage Project, on Deer Creek, northeast of Vina, in southeast Tehama County, California. The survey area (hereafter referred to as the Study Area) included all lands subject to potential direct and indirect project impacts, including the construction site and access roads. All plant species were identifiable to the taxonomic level necessary to determine conservation status and scientific significance on the date of the field survey (April 25 and May 4, 2018). Two short road realignment segments, subsequently added to the project, were surveyed on December 19, 2018, when all plants were not identifiable. A follow-up survey for these segments is recommended.

Four special-status plant species were encountered within the Study Area on the dates of survey: Hogwallow Starfish (*Hesperevax caulescens*; CNPS Rank 4.2) was encountered at one site along the margin of the southern access road; Shield-bracted Monkey-flower (*Erythranthe glaucescens*; CNPS Rank 4.3) was encountered at scattered sites, mostly in association with banks of the DCID Irrigation Ditch; Tehama Navarretia (*Navarretia heterandra*; CNPS Rank 4.3) was encountered at numerous sites along the margins of both access roads; Bidwell's Knotweed (*Polygonum bidwelliae*; CNPS Rank 4.3) was encountered at a few scattered sites along the margins of the northern access road. Mitigation is generally not required for CNPS List 4.3 species unless the population has particular conservation significance (e.g., outside of known range, the type locality, morphologically/genetically unique, etc.). All four of these CNPS Rank 4 species are locally frequent in the region and generally abundant where they occur. Numerous populations of these species occur elsewhere on the Leininger Ranch, which is protected under a Conservation Easement with TNC. Loss of plants as a result of implementing this project will not likely affect overall viability of these four species. Mitigation measures are recommended however, to minimize impacts to them.

The southern access road and most of the construction site itself are included on lands designated by USFWS as Critical Habitat for 4 Federally-Listed vernal pool plant species [Hoover's Spurge (*Euphorbia hooveri*), Hairy Orcutt Grass (*Orcuttia pilosa*), Slender Orcutt Grass (*Orcuttia tenuis*) and Greene's Tuctoria (*Tuctoria greenii*)]. Hoover's Spurge is known from a single large vernal pool, situated on the east side of the southern access road, ~70 feet beyond the study area boundary. The nearest known Slender Orcutt Grass occurrence is ~0.9 mile away to the southeast, in a different sub-watershed. The nearest known occurrences of the other two species are all more than 4 miles distant. None of these species were encountered in the surveyed Study Area itself, and suitable vernal pool habitat for them is not present. (J. Dittes pers. obs.). Mitigation measures are recommended to completely avoid potential direct and indirect impacts to Critical Habitat for Federally-Listed vernal pool plant species.

II. Introduction

At the request of Tehama Environmental Solutions, Inc., a survey for special-status vascular plant species was conducted for the proposed Deer Creek DCID Dam Fish Passage Project on (April 25 and May 4, 2018) (**Figures 1 and 2**). The purpose of the botanical survey was to ascertain the potential presence of any special-status plant species, to locate populations of rare

plants if present, characterize vegetation and habitats, and to provide suggestions for mitigation measures for special-status botanical resources, if found.

III. Project Description

The proposed project is designed to increase upstream and downstream passage at the diversion dam for adult and juvenile salmonids and other native species while meeting DCID's irrigation needs. The project entails modification construction of a roughened rock ramp just downstream of the existing dam, and re-profile the diversion ditch to reduce the required head at the dam to supply diversion flows. Re-profiling the diversion ditch also requires reconstructing the fish screens and installing a new flow monitoring device within the diversion ditch.

IV. Location

The proposed Deer Creek DCID Dam Fish Passage Project is located on Deer Creek at the eastern edge of the Northern Sacramento Valley, at the base of the Cascade Range foothills. The Project Area is situated approximately 18.5 air-miles southeast of downtown Red Bluff, and 7.5 air-miles northeast of Vina in Tehama County, CA (T25N, R1W, NW1/4 Sec. 23, NE1/4 Sec. 22 of the Acorn Hollow 7.5' USGS Topographic Quadrangle & T25N, R1W, E1/2 Sec. 27 of the Richardson Springs NW 7.5' USGS Topographic Quadrangle; see **Figure 1**).

V. Methods

A preliminary investigation was performed that included a query of The California Native Plant Society's Inventory of Rare and Endangered Plants (CNPS 2018) for Tehama County. The California Department of Fish and Wildlife Natural Diversity Database was also queried for special-status plant species from the Acorn Hollow and Richardson Springs, and surrounding ten USGS 7.5' Topographic Quadrangles (Dewitt Peak, Panther Springs, Deer Creek Flat, Campbell Mound, Richardson Springs, Nord, Foster Island, Vina, Los Molinos and Tuscan Springs; CDFG, 2018). In addition, the Consortium of California Herbaria was queried for special-status species recorded from the vicinity but not included in the CNDDDB (<http://ucjeps.berkeley.edu/consortium/>). The results of these database queries were used, along with consideration of site location and habitat (including parent material/soils), to compile a list of vascular plant species with potential to occur in the Study Area. This information is summarized in **Table 1 (Appendix-A)**.

The field survey was conducted by John Dittes on April 25 and May 4, 2018. A subsequent survey was made of two short road realignment segments on December 19, 2018. The survey was performed with aid of a map with project Study Area boundary on aerial photo-base. An intuitive-controlled survey was performed within the Study Area. All areas subject to potential disturbance were assessed, along with a minimal 30-foot buffer. This included the project construction footprint, staging area, and ~1.8-mile reach of graded dirt-road on the southeast side of Deer Creek, and 0.6-mile reach on the northwest.

All plant species encountered were identified to the taxonomic level necessary to determine legal status and scientific significance. Plants not readily identified in the field were identified later in the lab. Scientific names follow Baldwin et al. (2012); common names follow Janeway (2013). Plant species encountered during the field surveys are listed in **Table 2 (Appendix-B)**.

VI. Results: Setting, Habitats and Plant Species Encountered

- a) **Geology/Soils**: The foothills at the eastern edge of the study area are comprised of the Pliocene-age Tuscan Volcanic Formation. The high alluvial terrace west of the foothills is comprised of the Pleistocene-age Red Bluff Formation, with Holocene-age deposits of the Modesto Formation associated with the drainage and historic floodplain of Deer Creek. The concrete diversion structure is situated within the channel of Deer Creek on Riverwash soils (Rr). These gravelly alluvium soils are found within the main drainage above and below the dam. Other soils associated with the Study Area include TuB (Tuscan cobbly loam, 1-5 % slopes), TxC (Tuscan very stony loam, 3-15% slopes), TgE (Toomes very rocky loam, 30-50% slopes), ThE (Toomes extremely rocky loam 1-50% slopes), An (Anita cobbly clay), MzT (Molinos complex, channeled), Mp (Millrace gravelly fine sandy loam 0-3% slopes), My (Molinos fine sandy loam, 0-3% slopes, MLRA17), Mzd (Molinos fine sandy loam, deep over gravel), and Kf (Keefers loam 0-3% slopes). These soils are alluvium or residuum derived from volcanic, igneous or sedimentary rock.

- b) **Topography**: The concrete diversion structure is situated in-channel on the active floodplain of Deer Creek at an elevation of ~510 feet; near where the creek exits the volcanic foothills (see **Figure 2**). The site is relatively level and the stream-gradient low (<2%); the overall site slopes gently west x southwest. The highest point in the Study Area is associated with the access road on the north side of the creek (605 feet elevation); the lowest point is at the southern end of the access road on the south side of the creek (400 feet elevation). Slopes range from nearly level, to near vertical on the southern canyon wall near the dam.

- c) **Hydrology**: The principal hydrologic feature in the Study Area is the perennial drainage of Deer Creek, a tributary of the Sacramento River. Its confluence with the latter is located approximately 9.2 air-miles to the southwest. Deer Creek supports quality aquatic habitat and herbaceous riparian-wetland and riparian woodland/scrub vegetation. From the Deer Creek Diversion structure, water passes into the DCID Ditch, which flows southwesterly through the Study Area before passing across the southern boundary. A short lateral ditch extends along a topographic swale from the main ditch in a southwesterly direction where it passes under the south access road via culvert pipe. In addition to Deer Creek and the irrigation ditch, there are a few small, shallow depressions and swales supporting seasonal wetland vegetation associated with the edges of the southern access road on the southeast side of the creek. A large vernal pool is situated just outside of the surveyed Study Area, on the east side of the southern access road. This vernal pool is indicated as a blue-line feature on the USGS Topographic Map (see **Figure 2**).

- d) **Disturbances**: Leininger Ranch is operated as a cattle ranch with dryland pasture. Evidence of livestock use is apparent along the access roads. Disturbance in the vicinity of the diversion dam and fish screen include those associated with routine access and operation of the facility.

- e) **Plant Communities:** Vegetation in the Study Area was characterized by species composition and habitat association (see **Figures 3**). Major plant communities include Annual Grassland/Herbland, Blue Oak Woodland/Savannah and Mixed Riparian Woodland/Scrub. General characteristics and species composition for each are as follows:

Annual Grassland/Herbland: This plant community dominates upland sites on the terraces and slopes on both sides of the riparian corridor of Deer Creek. It comprises the understory of Blue Oak Woodland/Savannah and is present along drier edges and openings in Mixed Riparian Woodland/Scrub. Species composition varies depending on site. On better-developed, deeper soils this community corresponds to the *Bromus (diandrus, hordeaceus)-Brachypodium distachyon* semi-natural stand, *Festuca perennis* semi-natural stand, or *Avena (barbata, fatua)* semi-natural stand of Sawyer et al. (2009). Thinner rockier soils support *Lasthenia californica-plantago erecta - Festuca microstachys* alliance of Sawyer et al. (2009). Non-native annual grasses observed include Silver European Hairgrass (*Aira caryophyllea*), Slender Wild-oat (*Avena barbata*), False Brome (*Brachypodium distachyon*), Small Rattlesnake Grass (*Briza minor*), Soft Chess (*Bromus hordeaceus*), Foxtail Chess (*Bromus madritensis*), Poverty Brome (*B. sterilis*), Ripgut Brome (*B. diandrus*), Hedgehog Dogtail (*Cynosurus echinatus*), Annual Rye (*Festuca perennis*), Rattail Fescue (*Festuca myuros*), Medusahead (*Elymus caput-medusa*), Nitgrass (*Gastridium phleoides*), Wall Barley (*Hordeum murinum*), Mediterranean Barley (*H. marinum* ssp. *gussoneanum*) and Bristly Koeler's-grass (*Koeleria gerardii*). Native grasses include Small Fescue (*Festuca microstachys*) and Three-awn (*Aristida oligantha*). Native annual forbs include California Plantain (*Plantago erecta*), Blow-wives (*Achyraea mollis*), Fiddleneck (*Amsinckia menziesii*), Valley Tassels (*Castilleja attenuata*), Fitch's Spikeweed (*Centromadia fitchii*), Purple Clarkia (*Clarkia purpurea*), Fremont's Tidy-tips (*Layia fremontii*), California Goldfields (*Lasthenia californica*), Shiny Peppergrass (*Lepidium nitidum*), Dwarf Lessingia (*Lessingia nana*), Bird's-eye Gilia (*Gilia tricolor*), Q-tips (*Micropus californicus*), Marigold Navarretia (*Navarretia tagetina*), Downy Navarretia (*N. pubescens*), Hoary Popcorn-flower (*Plagiobothrys canescens*), Common Popcorn-flower (*Plagiobothrys nothofulvus*), Dwarf-stonecrop (*Sedella pumila*), Foothill Clover (*Trifolium ciliolatum*), Johnnytuck (*Triphysaria eriantha*) and others. Native geophytes include Yellow Mariposa Lily (*Calochortus luteus*), Narrow-leaved Soaproot (*Chlorogalum angustifolium*), Wavy-leaved Soaproot (*C. pomeridianum*), Blue Dicks (*Dichelostemma capitatum*) and Round-toothed Ookow (*Dichelostemma multiflorum*), and Bridge's Tritelia (*Triteleia bridgesii*). Non-native forbs observed include Yellow Star-thistle (*Centaurea solstitialis*), Filaree (*Erodium cicutarium, E. moschatum*), Smooth Cat's-ear (*Hypochaeris glabra*), Bur Clover (*Medicago polymorpha*), Grasspink (*Petrorhagia dubia*), Hop Clover (*Trifolium dubium*), Rose Clover (*T. hirtum*), Sessile-headed Clover (*T. glomeratum*), Dove's-foot Geranium (*Geranium mollis*), Smartweed (*Polygonum aviculare*), Ruby Sandspurrey (*Spergularia rubra*) and others.

Blue Oak Woodland/Savannah: This woodland type occurs at scattered locations along both the northern and southern access roads. A few small areas were mapped within the Study Area, in association with the lower slopes above the floodplain of Deer Creek, in the vicinity of the construction/staging areas. Blue Oak Woodland/Savanna intergrades

with Valley and Foothill Annual Grassland/Herbland, which comprises the herbaceous layer. Depending on site, vegetation corresponds to the Blue Oak Woodland (*Quercus douglasii* Woodland Alliance) of Sawyer et al. (2009). Other tree species observed in the mapped woodland in the Study Area include scattered Valley Oak (along floodplain), Interior Live Oak (*Quercus wislizenii*) and California Juniper (*Juniperus californica*). Shrubs are mostly lacking.

Mixed Riparian Woodland/Scrub: This woodland type is associated with floodplain and banks of Deer Creek and some reaches of the DCID Irrigation Ditch. Composition varies by location. Depending on site, vegetation corresponds either to the California Sycamore Woodland (*Platanus racemosa* Woodland Alliance), or the Valley Oak Woodland (*Quercus lobata* Woodland Alliance) types of Sawyer et al. (2009). Where the canopy is open and larger trees lacking, vegetation corresponds to the *S. lasiolepis* and *Salix exigua* Shrubland Alliances of Sawyer et al. (2009). In addition to California Sycamore and Valley Oak, other tree species observed include White Alder (*Alnus rhombifolia*), Oregon Ash (*Fraxinus latifolia*), Fremont Cottonwood (*Populus fremontii*), Gooding's Black Willow (*Salix gooddingii*) and Edible Fig (*Ficus carica*). Shrubs and subshrubs include Sandbar Willow (*Salix exigua*), Arroyo Willow (*S. lasiolepis*), Blue Elderberry (*Sambucus nigra* ssp. *caerulea*), California Rose (*Rosa californica*), Hoary Coffeeberry (*Frangula californica* ssp. *tomentella*), Western Spicebush (*Calycanthus occidentalis*), Buttonwillow (*Cephalanthus occidentalis*), Himalayan Blackberry (*Rubus armeniacus*), California Blackberry (*R. ursinus*) and Poison Oak (*Toxicodendron diversilobum*). Vines include California Grape (*Vitis californica*), California Greenbrier (*Smilax californica*) and California Pipevine (*Aristolochia californica*).

In drier sites, the herbaceous component of the understory is comprised of Annual Grassland/Herbland species (see description above). Additional non-native forb species encountered in the understory include Bur-chervil (*Anthriscus cauculis*), Hedge Parsley (*Torilis arvensis*), Cleavers (*Galium aperine*), Chickweed (*Stellaria media/pallida*), Subterranean Clover (*Trifolium subterraneum*), Sherardia (*Sherardia arvensis*), Garden Vetch (*Vicia sativa*), Hedge-mustard (*Sisymbrium officinale*), Horehound (*Marrubium vulgare*) and others. Native forb species include Small-flowered Miner's Lettuce (*Claytonia parviflora*), and a few others. Plants associated with moister sites include natives such as Hoary Stream-nettle (*Urtica dioica* ssp. *holosericea*), Mugwort (*Artemisia douglasiana*), Toadrush (*Juncus bufonius*), Cocklebur (*Xanthium strumarium*), Canadian Horseweed (*Erigeron canadensis*), Western Goldenrod (*Euthamia occidentalis*), White Sweet-clover (*Melilotus albus*), Spanish Lotus (*Acmispon americanus* var. *americanus*), Northern Willowherb (*Epilobium ciliatum*), Bird's-foot Trefoil (*Lotus corniculatus*), Sticktight (*Bidens frondosa*), Common Monkey-flower (*Erythranthe gutattus*) and others. Grasses in these moister sites include Rice Cutgrass (*Leersia oryzoides*), Dallisgrass (*Paspalum dilatatum*), Johnsongrass (*Sorghum halapense*) and Beardgrass (*Polypogon* sp.). Grasslike plants include scattered Pacific Rush (*Juncus effusus*), Torrent Sedge (*Carax nudata*) and Umbrella Sedge (*Cyperus eragrostis*).

Emergent Wetland: Small areas of Emergent Wetland are associated with the immediate bank and beds of Deer Creek and along the Irrigation Ditch. Depending on site, this

vegetation best corresponds to the *Carex nudata* Herbland Alliance of Sawyer et al. (2009). In addition to Torrent Sedge (*C. nudata*), and some species mentioned under Mixed Riparian Woodland/Scrub, others include Yellow Waterweed (*Ludwigia peploides* ssp. *peploides*), Pondweed (pre-flowering *Potamogeton* sp.), and Smartweed (pre-flowering *Polygonum* sp.). A small area of emergent wetland/meadow is associated with a topographic swale draining off the main irrigation ditch, at the edge of the southern access road. This wetland supports Common Spikerush (*Eleocharis macrostachya*), Annual Rye (*Festuca perennis*), Mannagrass (*Glyceria declinata*), Dallisgrass (*Paspalum dilatatum*), Common Monkeyflower (*Erythranthe gutattus*), Hawk's-bit (*Leontodon saxatilis*), White-tipped Clover (*Trifolium variegatum*) and others.

Seasonal Wetland: Seasonal wetland vegetation is associated with a few, small, isolated depressions that occur along the margins of the southern access road; these were not mapped separately for this botanical investigation (see Jurisdictional Wetlands Delineation, Tehama Environmental Solutions, 2019). Vegetation is dominated by marginally hydrophytic non-native grasses, including Mediterranean Barley (*Hordeum marinum* ssp. *gussoneanum*) and Annual Rye (*Festuca perennis*). Sub-dominant species in a few depressions include some of those associated with vernal pools in the vicinity, including Annual Hairgrass (*Deschampsia danthonioides*), Coyote Thistle (*Eryngium castrense*), Stalked Popcorn-flower (*Plagiobothrys stipitatus*), Fremont's Goldfields (*Lasthenia fremontii*), Yellow Carpet (*Blennosperma nana*), Sacramento Valley Pogogyne (*Pogogyne zyziphoroides*), Purselane Speedwell (*Veronica peregrina* ssp. *xalapensis*) and Hyssop Loosestrife (*Lythrum hyssopifolium*). These species are infrequent and not predominant in any of the wetlands in the Study Area.

- f) **Critical Habitat for Federally Listed Species:** The southern access road and most of the construction site Study Area itself are included within lands designated and mapped by United States Fish and Wildlife Service (USFWS) as Critical Habitat for four Federally-Listed Vernal Pool Plant Species [Hoover's Spurge (*Chamaesyce hooveri*; Federally Endangered), Hairy Orcutt Grass (*Orcuttia pilosa*; Federally Endangered, State Endangered), Slender Orcutt Grass (*Orcuttia tenuis*; Federally Threatened, State Endangered), and Greene's Tuctoria (*Tuctoria greenei*; Federally Endangered, State Rare) (Federal Register February 10, 2006)].

The nearest population of each of these federally-listed species is indicated in **Figure 4**. As shown, Hoover's Spurge is known from the immediate vicinity of the Study Area (CNDDDB Occurrence #26). This population is associated with a single, large, isolated vernal pool, the western edge of which is situated ~70 feet beyond (east of), the Study Area along the southern access road. The nearest known Hairy Orcutt Grass population (CNDDDB Occurrence #42) is associated with a large, isolated vernal pool located approximately 0.93 air-mile to the southeast of the Study Area boundary. The nearest known Slender Orcutt Grass population (CNDDDB Occurrence #119) is located approximately 4.02 air-miles to the west. The nearest known Greene's Tuctoria population (CNDDDB Occurrence #43) is situated approximately 4.26 air-miles to the west.

Critical habitat for these listed vernal pool species possesses Primary Constituent Elements

(PCEs) described as follows (Federal Register, August 11, 2005):

(i) Topographic features characterized by isolated mound and intermound complex within a matrix of surrounding uplands that result in continuously, or intermittently, flowing surface water in the depressional features including swales connecting the pools described in paragraph (2)(ii) of this section, providing for dispersal and promoting hydroperiods of adequate length in the pools; and (ii) Depressional features including isolated vernal pools with underlying restrictive soil layers that become inundated during winter rains and that continuously hold water or whose soils are saturated for a period long enough to promote germination, flowering, and seed production of predominantly annual native wetland species and typically exclude both native and nonnative upland plant species in all but the driest years. As these features are inundated on a seasonal basis, they do not promote the development of obligate wetland vegetation habitats typical of permanently flooded emergent wetlands

Both PCEs are associated with a sub-watershed portion of the lands on the east side of the southern access road Study Area. A large vernal pool, which supports a previously-documented population of Hoover's Spurge (Occurrence #26), is situated ~ 70 feet beyond the Study Area's eastern boundary (see **Figure 5**). As indicated, there are two smaller, shallower vernal pool basins, also beyond the Study Area boundary, located a short distance north of the large pool. These vernal pools, swales and the associated uplands that drain into them are habitats providing both PCEs (i) and (ii), for the four Federally-Listed vernal pool plant species in their critical habitat designation.

The hydrologic subwatershed satisfying both PCEs is indicated in **Figure 5**. The boundaries of this sub-watershed area are defined on the west by the existing graded southern access road (~0.6 mile segment), which mostly follows a low topographic ridge paralleling historic/prehistoric overflow channels/swales at the edge of the Deer Creek floodplain. The eastern boundary is functionally-defined by the excavated/bermed DCID Irrigation Ditch. The north-northwest boundary is defined by the topographic draw within which flows the Irrigation Ditch Lateral. Precipitation runoff flowing southward on the east side of the access road is intercepted by this swale/ditch and conveyed to the Deer Creek overflow channel on the west side of the road.

There are no vernal pools or swales within or immediately adjacent to the construction site portion of the Study Area, nor are there any associated with the northern access road. The seasonal wetlands in the surveyed Study Area lack Primary Constituent Elements that characterize designated critical habitat for the four federally-listed plant species; they are hydrologically isolated, and associated wetland vegetation in them is dominated by non-native annual grasses (see previous description herein and Revised Jurisdictional Wetlands Delineation Report prepared for this project, TES 2019). Note that large areas in the vicinity that have been designated as Critical Habitat for the four Federally-Listed species lack both PCEs. For example, the historic and active floodplain of Deer Creek, a portion of which was previously cultivated as orchard (between southern access road and active channel of Deer Creek), completely lack vernal pools/swales, they lack soils typically associated with vernal pools/swales, and they do not contribute precipitation runoff to lands that do.

VII. Results: Special-Status Plant Species in the Study Area:

The 2018 Online CNPS Inventory lists 129 special-status plant taxa for Tehama County (CNPS 2016). Some of these are currently listed, or are candidates for inclusion on state and federal lists. Several special-status species are known to occur in the general vicinity of the Study Area and/or have potentially suitable habitat present. **Table 1** summarizes the results of the CNDDDB, CNPS Inventory, and CSUC Herbarium database queries for sensitive plant species with geographic and elevation ranges that overlap with the Deer Creek DCID Dam Fish Passage Project Study Area.

No special-status vascular plant species have been previously documented from within the Study Area as indicated by the database queries. Timing of the 2018 field surveys was such that all potentially occurring species included in the database queries would have been identifiable at least to the level of genus (see **Table 1**), if present. Plant species observed and documented during the 2018 field surveys are summarized in **Table 2**. During these surveys, no plant species were encountered that were not identifiable to the level necessary to make determination of significance.

This 2018 field survey revealed the presence of four special-status vascular plant species within the Study Area, **Hogwallow Starfish (*Hesperervax caulescens*; CNPS Rank 4.2)**, **Shield-bracted Monkey-flower (*Erythranthe glaucescens*; CNPS Rank 4.3)**, **Tehama Navarretia (*Navarretia heterandra*; CNPS Rank 4.3)**, **Bidwell's Knotweed (*Polygonum bidwelliae*; CNPS Rank 4.3)**: No Federal or State-listed plant species were encountered in the surveyed Study Area (J. Dittes pers. obs.), although a single large vernal pool supporting a previously-documented population of Hoover's Spurge (*Euphorbia hooveri*) is located just east of the southern access road [see **Section XI(f)**]. There are no vernal pools or vernal swales in the surveyed Study Area.

Hogwallow Starfish (*Hesperervax caulescens*; CNPS Rank 4.2): Hogwallow Starfish was encountered at one site along the margin of the southern access road (see **Figure-6**); several hundred plants were observed in a single colony. Additional plants were observed beyond the 30' survey corridor. It should be noted that the 2017-2018 growing season was well below average with regard to precipitation and its timing. During a "normal" rainfall-season, Hogwallow Starfish may be express at additional sites along the southern access road (including the northernmost proposed realignment). This species is known from 20 counties in California, including Amador, Alameda, Butte, Contra Costa, Colusa, Fresno, Glenn, Kern, Merced, Monterey, Napa, Sacramento, San Diego, San Joaquin, San Luis Obispo, Solano, Stanislaus, Sutter, Tehama and Yolo. CNPS lists a total of 13 USGS quadrangles from which it is recorded. The species has been assigned a CNPS Rank of 4.2, which means it is uncommon in California and is fairly endangered. It has been assigned a State Rank of S3 and Global Rank of G3, meaning it is "Vulnerable". Hogwallow Starfish is threatened by development, agriculture, and possible overgrazing. Other occurrences of this species are encompassed within lands in the vicinity held in Conservation Easement with TNC in their Lassen Foothills Project Area, including locations elsewhere on the Leininger Ranch (J. Dittes, pers. obs.).

Shield-bracted Monkey-flower (*Erythranthe glaucescens*; CNPS Rank 4.3): Shield-

bracted Monkey-flower was encountered at scattered sites along the banks of the DCID Irrigation Ditch, and at a few locations within the floodplain of Deer Creek (see **Figure 7**). This species is known from Shasta, Tehama, Butte, Colusa, Lake and Nevada Counties. It occurs on 32 USGS 7.5' Topographic Quadrangles. Shield-bracted Monkey-flower is locally frequent and often abundant along drainages and on seeps associated with the Tuscan Volcanic Formation between Table Mountain in Butte County and Battle Creek in Shasta County. This species has been assigned a CNPS Rank of 4.3, meaning it is uncommon but not very endangered in California. It has been assigned a State Rank of S3S4 and Global Rank of G3G4, meaning it is "Vulnerable, but apparently Secure". Numerous occurrences are encompassed within lands held in Conservation Easement with TNC in their Lassen Foothills Project Area (J. Dittes, pers. obs.). CNPS does not list the number of occurrences for this taxon.

Tehama Navarretia (*Navarretia heterandra*; CNPS Rank 4.3): Tehama Navarretia was encountered at multiple scattered locations along reaches of both the north and south access roads (including the northernmost proposed realignment); some of these colonies are situated within the southeast portion of the Construction Site Study Area (see **Figure 8**). Colonies ranged from a few individuals to 500+ plants; these are associated with heavier, seasonally-moist soils. This species is known from numerous extant occurrences distributed between Butte, Colusa, Lake, Napa, Shasta, Tehama, Trinity and Yuba Counties in California (17 USGS Quadrangles), and from Oregon (CNPS does not list the number of occurrences for this taxon). This species has been assigned a CNPS Rank of 4.3, meaning it is uncommon but not very endangered in California. It has been assigned a State Rank of S4, meaning it is apparently secure in California; with a Global Rank of G4, it is deemed apparently secure, considering occurrences outside of California. Numerous occurrences are encompassed within lands held in Conservation Easement with TNC in their Lassen Foothills Project Area, including locations elsewhere on the Leininger Ranch (J. Dittes, pers. obs.).

Bidwell's Knotweed (*Polygonum bidwelliae*; CNPS Rank 4.3): Bidwell's Knotweed was encountered at a few scattered sites along a reach of the northern access road; small colonies are associated with relatively barren, thin and rocky soils on the slope above the temporary staging area (see **Figure 9**). This species is known from numerous extant occurrences associated with the Tuscan Volcanic Formation in Butte, Tehama and Shasta Counties. Although geographically restricted in range, populations are frequent and many of them quite large; the species is recorded from 17 USGS 7.5' topographic quadrangles. This species has been assigned a CNPS Rank of 4.3, meaning it is uncommon but not very endangered in California. It has been assigned a State Rank of S4, meaning it is apparently secure in California; with a Global Rank of G4, it is deemed apparently secure, considering occurrences outside of California. Numerous occurrences are encompassed within lands held in Conservation Easement with TNC in their Lassen Foothills Project Area, including locations elsewhere on the Leininger Ranch (J. Dittes, pers. obs.).

VIII. Potential Impacts

Designated Critical Habitat for Federally-Listed Vernal Pool Plant Species

Critical habitat possessing both PCEs for the 4 federally-listed vernal pool plant species is associated with a portion of lands located on the east side of the southern access road. Habitats

possessing PCEs are not present at neither the construction site or north access road Study Areas (see **Figure 5**). There are no proposed road improvements planned in the immediate vicinity of the large vernal pool, and as long as all vehicles are confined to the existing road surface within its sub-watershed (~0.6-mile long segment), direct and/or indirect impacts will not occur to that pool or its sub-watershed. The southernmost of two proposed road segment realignments is situated entirely in upland habitat. During precipitation events, any overland runoff passing from this southern road alignment southward towards the large vernal pool is intercepted by the topographic draw and Irrigation Ditch Lateral, and conveyed westward across the road and onto the Deer Creek Floodplain. The northernmost proposed road segment realignment extends over a topographic draw that passes south, then west across the existing road onto the floodplain of Deer Creek. As with the southern realignment, any precipitation runoff from uplands along this northern alignment will pass westward across the existing road and onto the Deer Creek floodplain. Potential direct and indirect impacts to habitats possessing PCEs resulting from project implementation are readily avoidable (see mitigation measures **Section IX**).

Rare Plants Encountered in Study Area

Implementation of the proposed project has potential to directly and indirectly impact populations of four special-status vascular plant species; **Hogwallow Starfish (*Hesperevax caulescens*; CNPS Rank 4.2)**, **Shield-bracted Monkey-flower (*Erythranthe glaucescens*; CNPS Rank 4.3)**, **Tehama Navarretia (*Navarretia heterandra*; CNPS Rank 4.3)** and **Bidwell's Knotweed (*Polygonum bidwelliae*; CNPS Rank 4.3)**. There will also be direct and indirect impacts to small areas of Mixed Riparian Woodland/Scrub and Emergent Wetland vegetation. These sensitive habitat areas are potentially jurisdictional and under regulation of the United States Army Corp of Engineers (USCOE under authority of Section 404 of the Clean Water Act, and of California Department of Fish and Wildlife (CDFW) under Section 1600 of the Fish and Game Code. These potential impacts and proposed mitigation measures for riparian and wetland habitats is addressed in a separate report (Tehama Environmental Solutions, 2018).

IX. Mitigation Measures

a) **Critical Habitat for Federally-Listed Vernal Pool Plant Species: As described in Section VI(f), a sub-water shed on the east side of the southern access road provides PCEs for 4 federally-listed vernal pool plant species. Potential direct and indirect impacts to this Critical Habitat area will be avoided with adoption of 2 mitigation measures:**

- 1) Use existing southern access road surface; avoid all road improvements along the 0.6-mile long reach of road within the sub-watershed of the large vernal pool/Hoover's Spurge population.
- 2) Signage and flagging will be used along the 0.6-mile long reach of road within the sub-watershed of the large vernal pool/Hoover's Spurge population. The signs and flagging will clearly indicate the sensitive habitat area bordering the eastern side of the road. All drivers and machinery operators will be made aware of the sensitive resource area and will confine all vehicle/machinery travel to the existing road surface.

b) **Special-status Plant Species:** Mitigation measures are generally not proposed for CNPS Rank-4 species, unless the population is “unique” in some way (e.g., outside of geographic or elevation range, type locality, morphologically/genetically-distinct, etc.). With regard to this project however, the documented sub-populations of Hogwallow Starfish (*Hesperivax caulescens*; CNPS Rank 4.2), and Bidwell’s Knotweed (*Polygonum bidwelliae*; CNPS Rank 4.3) can be readily protected via pre-project avoidance measures. Tehama Navarretia (*Navarretia heterandra*; CNPS Rank 4.3) will be protected via avoidance along the existing southern access road, and impacts minimized along the proposed northern access road realignment. Similarly, if pre-construction surveys along the 2 proposed road realignments reveal additional Hogwallow Starfish subpopulations, impacts will be minimized to the degree possible.

- 1) If road improvements are anticipated, it is recommended that all road improvement activities be conducted in such a manner that disturbances are confined to the already disturbed road prism.
- 2) It is recommended that all vehicles will be restricted to the existing disturbed road prism. Prior to project commencement, designated parking and passing areas will be established, mapped along segments of the road that are free of these three special-status plant species. These designated pull-off areas will be clearly marked on the ground with colored pin flags. All operators will be educated and made aware of the sensitive resource and avoidance measures.
- 3) Impacts to several hundred Shield-bracted Monkey-flower occurring on the banks of the DCID ditch are unavoidable. A smaller number of individuals was observed along a side channel of the main creek. These could potentially be impacted by construction of a temporary diversion channel. Considering that this is an annual species with water-dispersed seeds, plants in the active floodplain may be “transient”, with site-of the season influenced by winter high-water flows. Considering its distribution and abundance, and the number of populations in the region encompassed by local private lands protected in Conservation Easement, loss of the plants on the irrigation ditch banks and north side-channel will not likely affect the viability, nor change the conservation status of this species. No mitigation measures are proposed for potential impacts to this CNPS Rank 4.3 Species here.
- 4) Impacts to several hundred Tehama Navarretia will occur as a result of construction of the northernmost realignment-segment of the southern access road. This is unavoidable. It is recommended however, that disturbances be restricted to the degree possible to the new road prism. Avoid ground-disturbances to areas on both sides of the new road segment where Tehama Navarretia occurs (e.g., placement of graded spoils/debris, parking of vehicles/machinery, etc.).
- 5) Conduct pre-construction survey on the two proposed road segment realignments to ensure nothing significant was missed by the December 2018 survey. If Tehama Navarretia or Hogwallow Starfish are discovered there,

mitigation measure-4 will be implemented.

- c) **Sensitive Habitats:** Implementation of the Project may result in impacts to areas of potentially jurisdictional Riparian Woodland/Scrub, Emergent Wetland and permanent aquatic habitats. Direct and indirect impacts to these sensitive habitats should be avoided or minimized to the degree possible. Appropriate mitigation measures will be developed by Tehama Environmental Solutions (TES) during the permitting process and in consultation with lead agencies.
- d) **Invasive Species:** Invasive species encountered in the Study Area include Yellow Star-Thistle (*Centaurea solstitialis*), Puncture-vine (*Tribulus terrestris*), Milk-thistle (*Silybum marianum*), Italian Plumeless Thistle (*Carduus pycnocephalus*), Klamathweed (*Hypericum perforatum*), Himalayan Blackberry (*Rubus armeniacus*) and Edible Fig (*Ficus carica*). All of these species are well-established in the region. There are several other species which are spreading in the region but which were not observed in the Study Area, including, but not limited to Goatgrasses (*Aegilops cylindrica*, *A. triuncialis*), and Stinkweed (*Dittrichia graveolens*). To prevent introduction of invasive plants species into, or spreading from the Study Area, it is recommended that all vehicles and equipment be washed before entering or leaving the site. In addition, all erosion-control materials (e.g., straw, seed-mixes) that might be used should be certified “Weed-free”.

X. References

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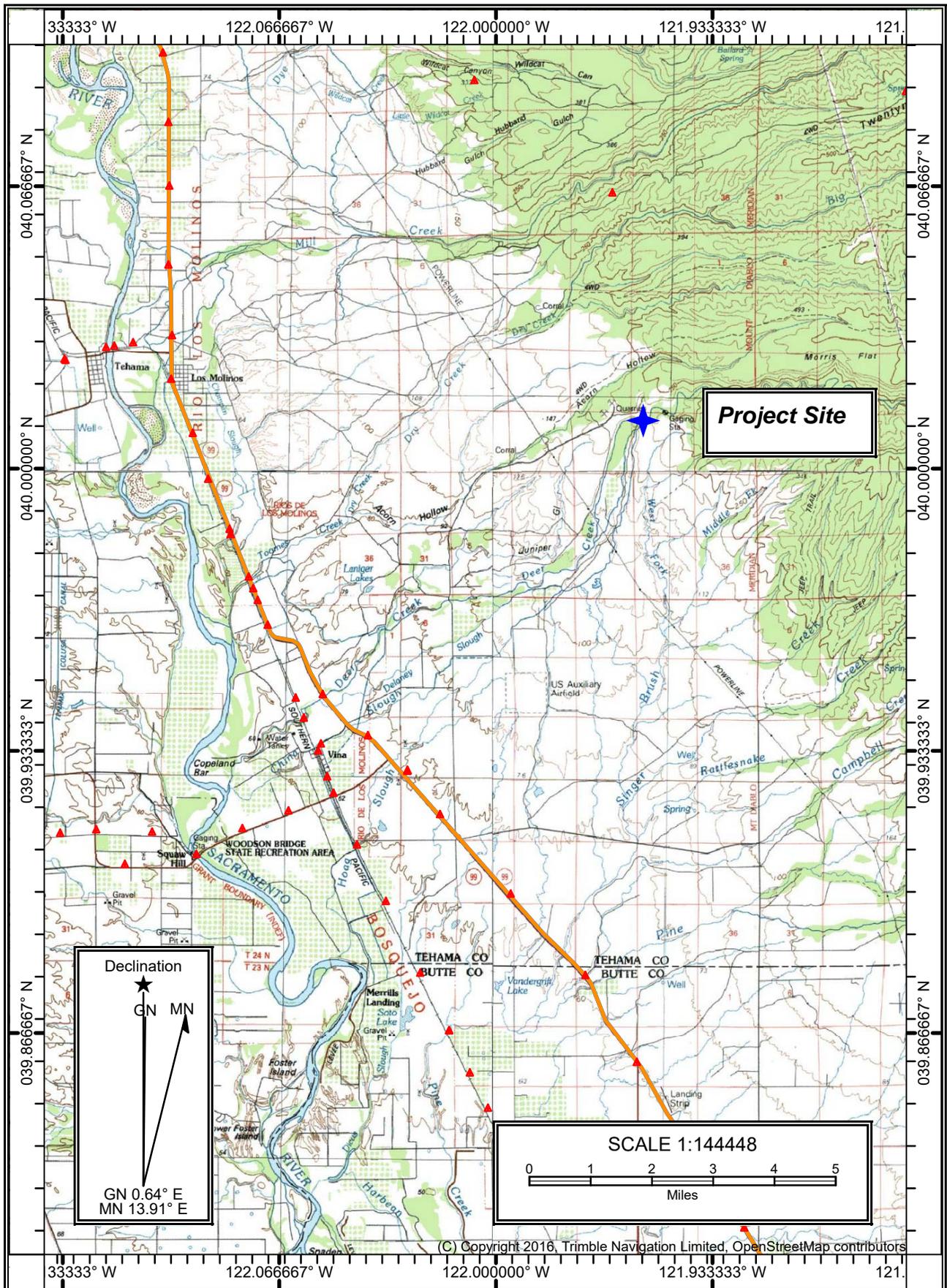
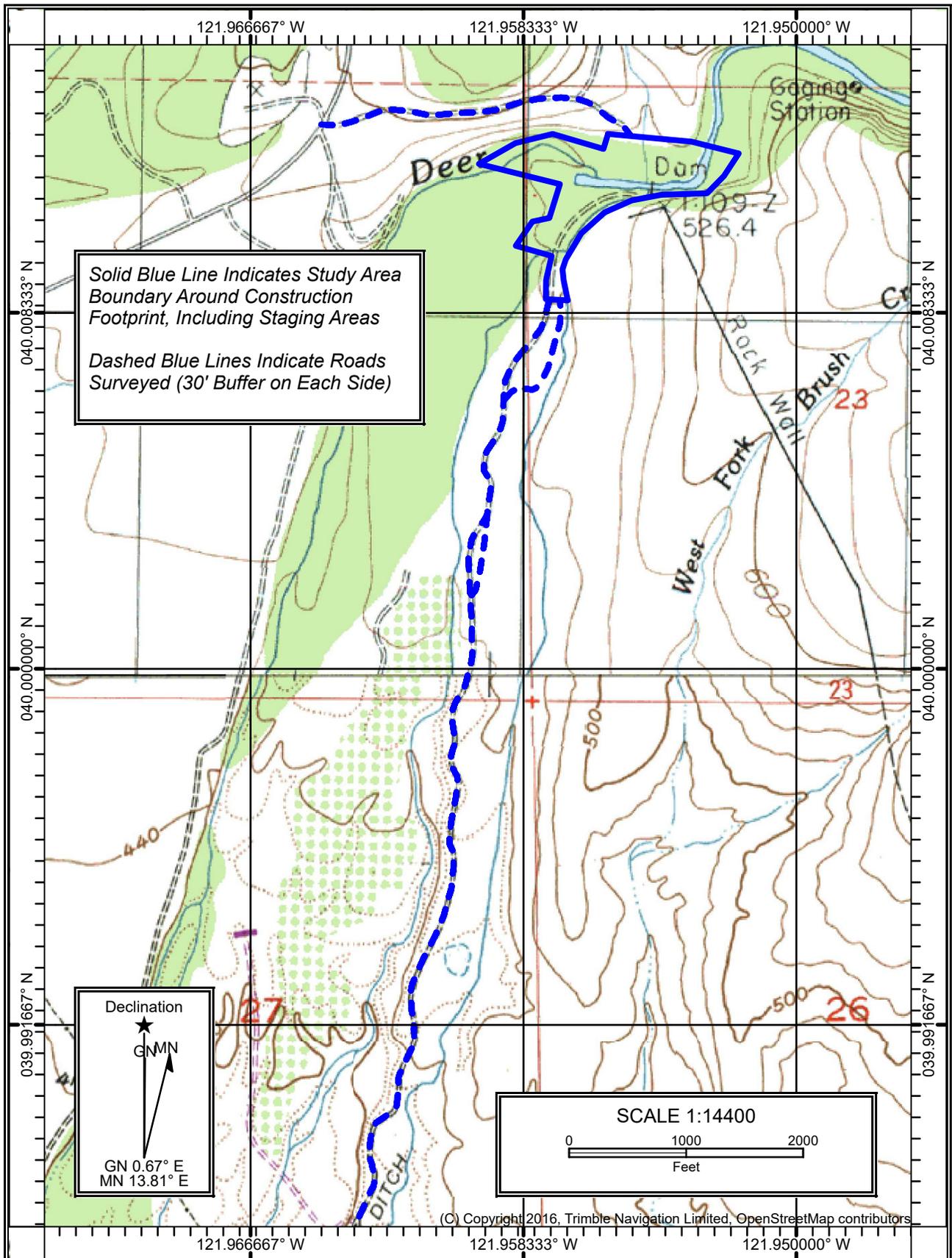


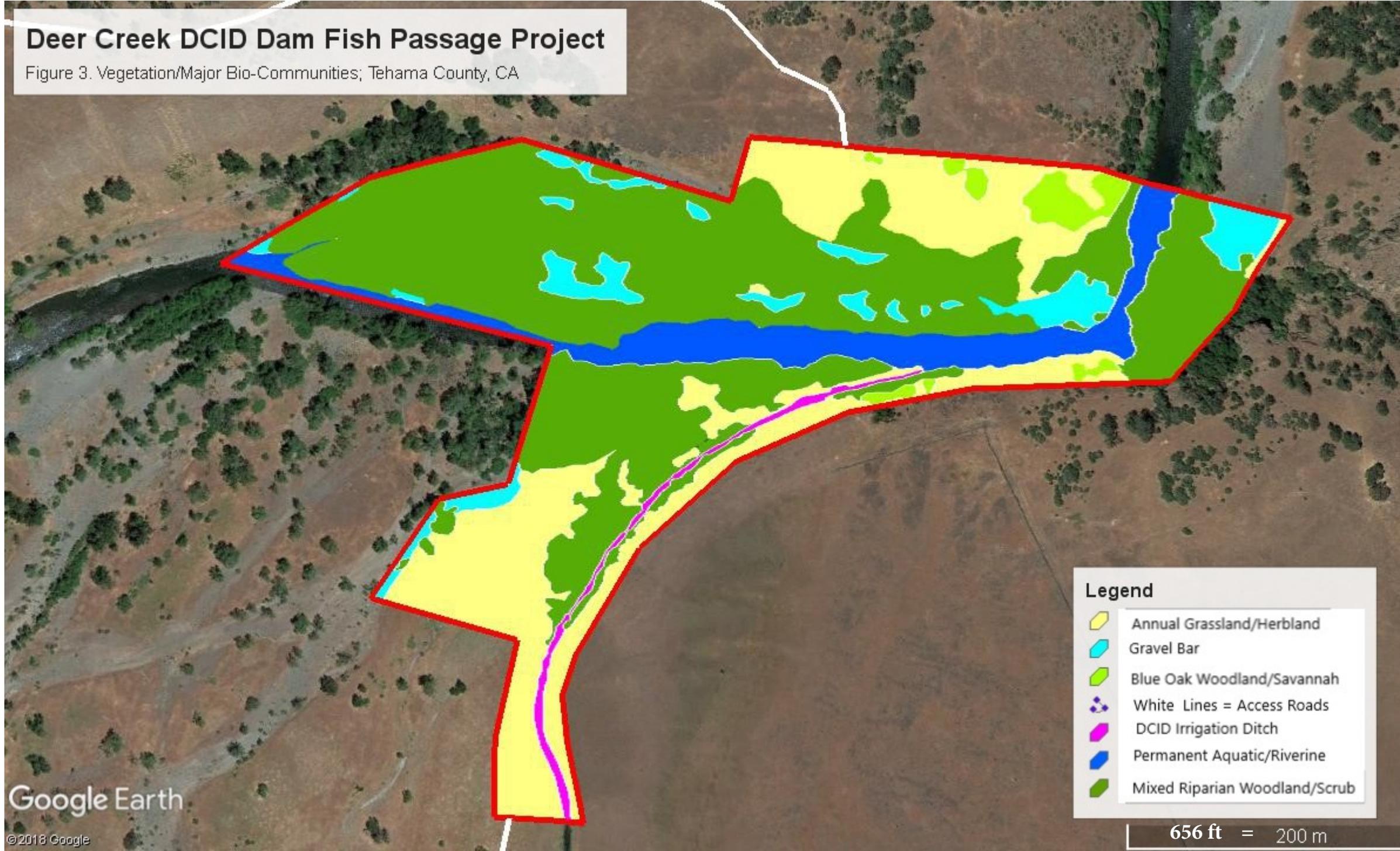
Figure 1. Regional Vicinity Map; Deer Creek DCID Dam Fish Passage Project; Tehama County, CA



*Figure 2. Deer Creek DCID Dam Fish Passage Project; Botanical Survey Study Area Boundaries and Site Topography; Tehama County, CA
Dittes & Guardino Consulting*

Deer Creek DCID Dam Fish Passage Project

Figure 3. Vegetation/Major Bio-Communities; Tehama County, CA



Legend

- Annual Grassland/Herbland
- Gravel Bar
- Blue Oak Woodland/Savannah
- White Lines = Access Roads
- DCID Irrigation Ditch
- Permanent Aquatic/Riverine
- Mixed Riparian Woodland/Scrub

656 ft = 200 m

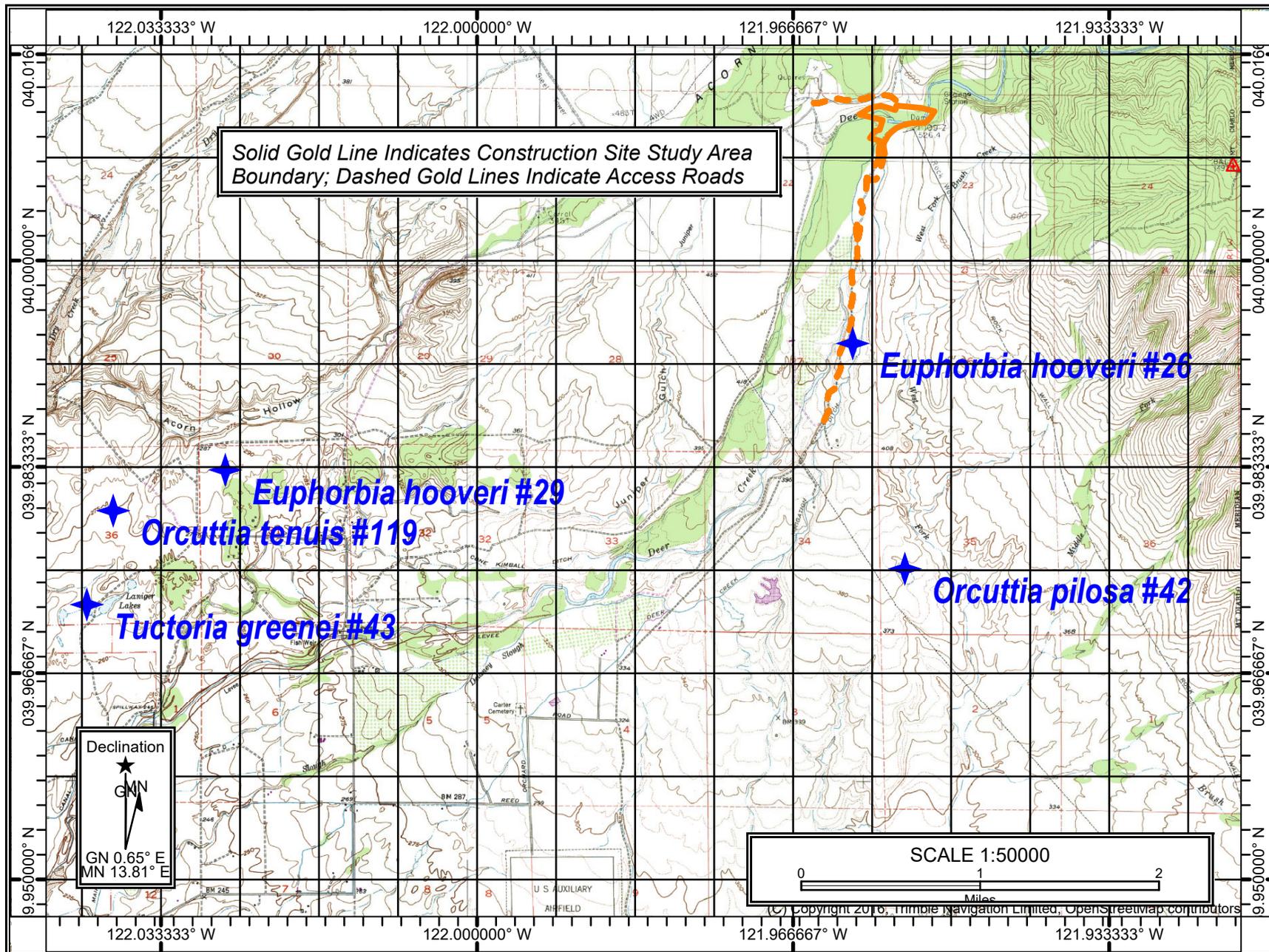
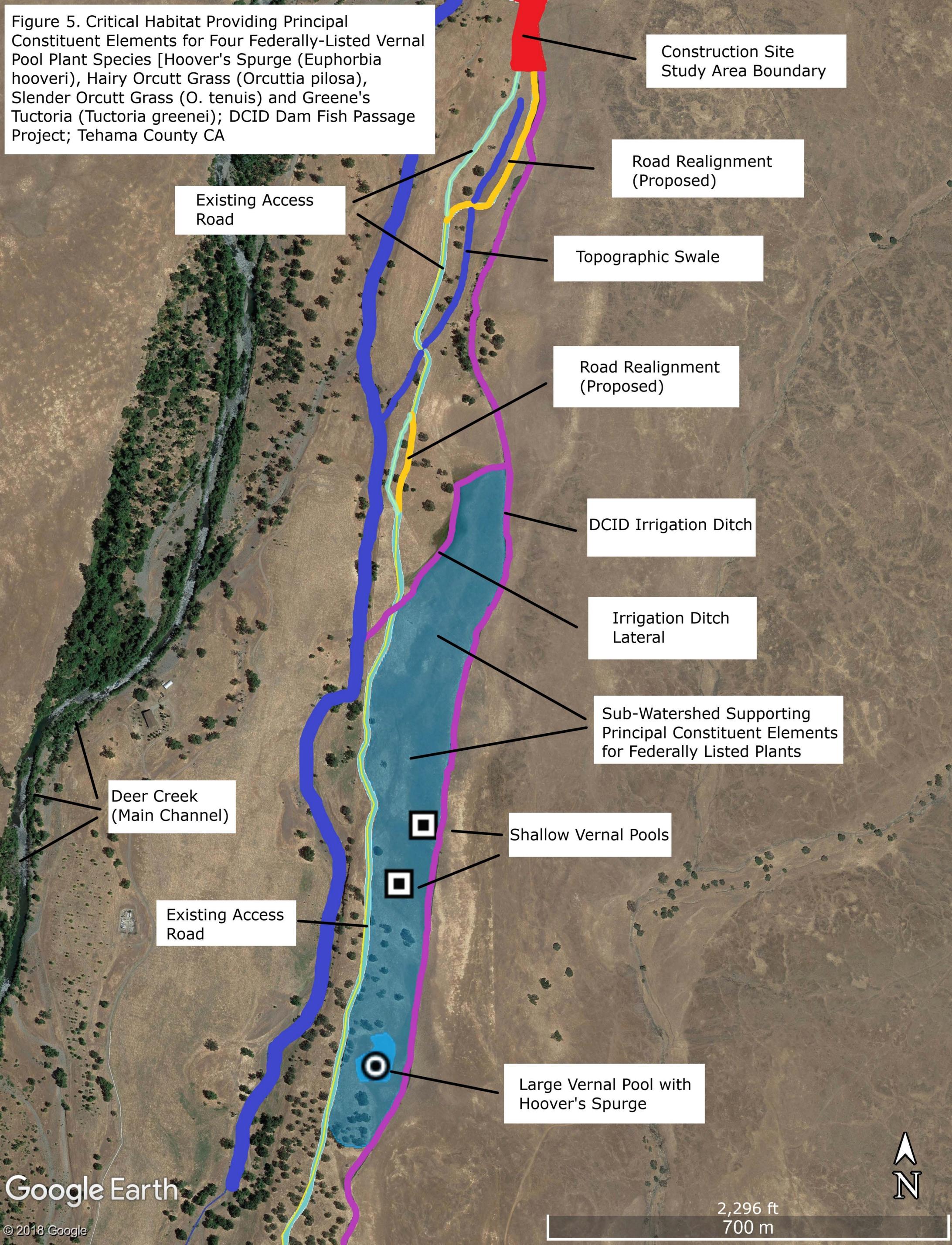


Figure 4. Federally-Listed Plant Species Documented in the Vicinity of Study Area; Deer Creek DCID Dam Fish Passage Project; Tehama County, CA; Hoover's Spurge (*Euphorbia hooveri*), Hairy Orcutt Grass (*Orcuttia pilosa*), Slender Orcutt Grass (*Orcuttia tenuis*) and Greene's Tuctoria (*Tuctoria greenei*); CNDDDB Occurrence #s are Indicated

Figure 5. Critical Habitat Providing Principal Constituent Elements for Four Federally-Listed Vernal Pool Plant Species [Hoover's Spurge (*Euphorbia hooveri*), Hairy Orcutt Grass (*Orcuttia pilosa*), Slender Orcutt Grass (*O. tenuis*) and Greene's Tuctoria (*Tuctoria greenei*); DCID Dam Fish Passage Project; Tehama County CA



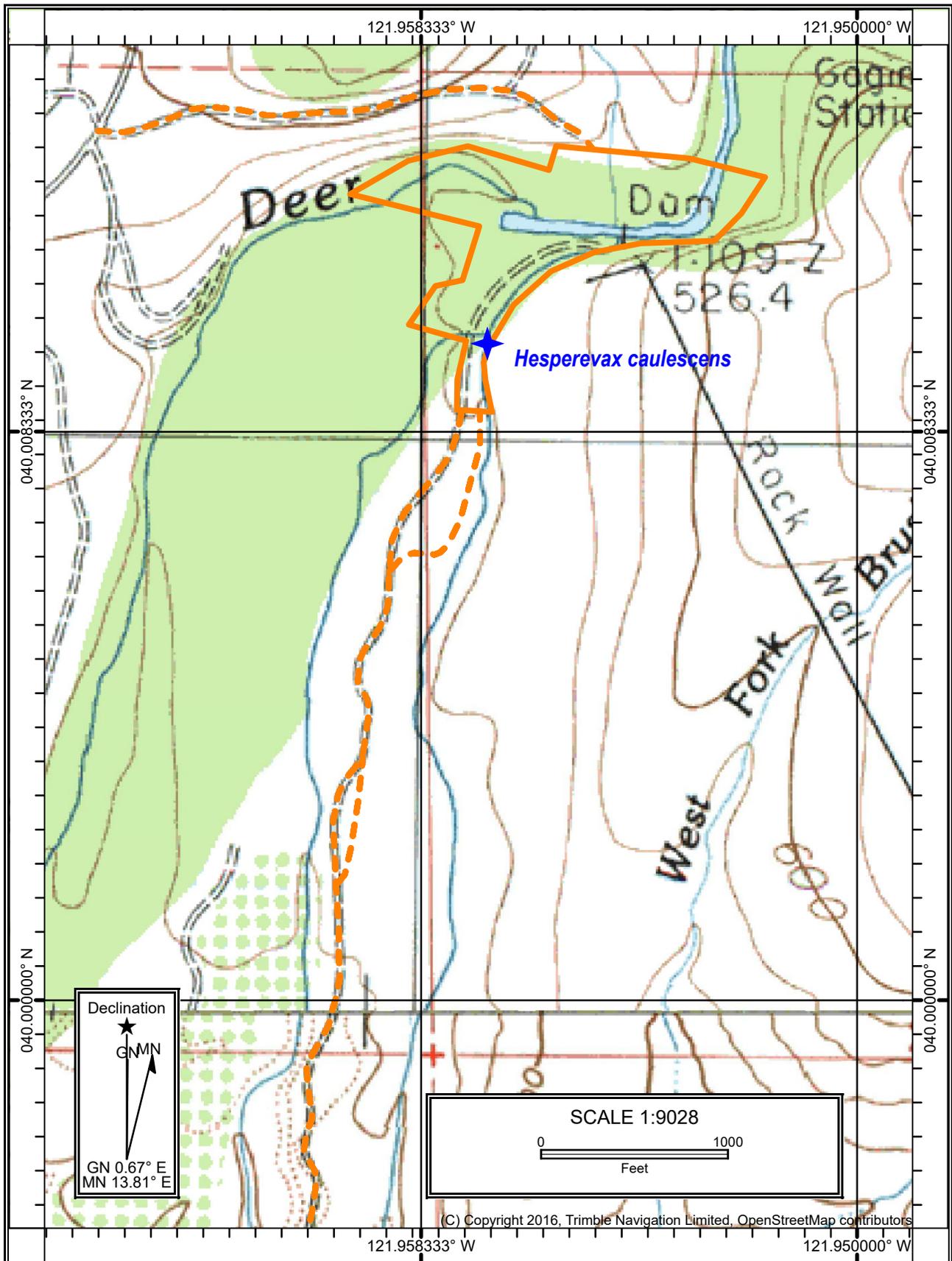


Figure 6. Hogwallow Starfish (*Hesperivax caulescens*; CNPS Rank 3.2); Deer Creek DCID Dam Fish Passage Project; Tehama County, CA; Surveyed by John Dittes on April 25, May 4, & December 19, 2018

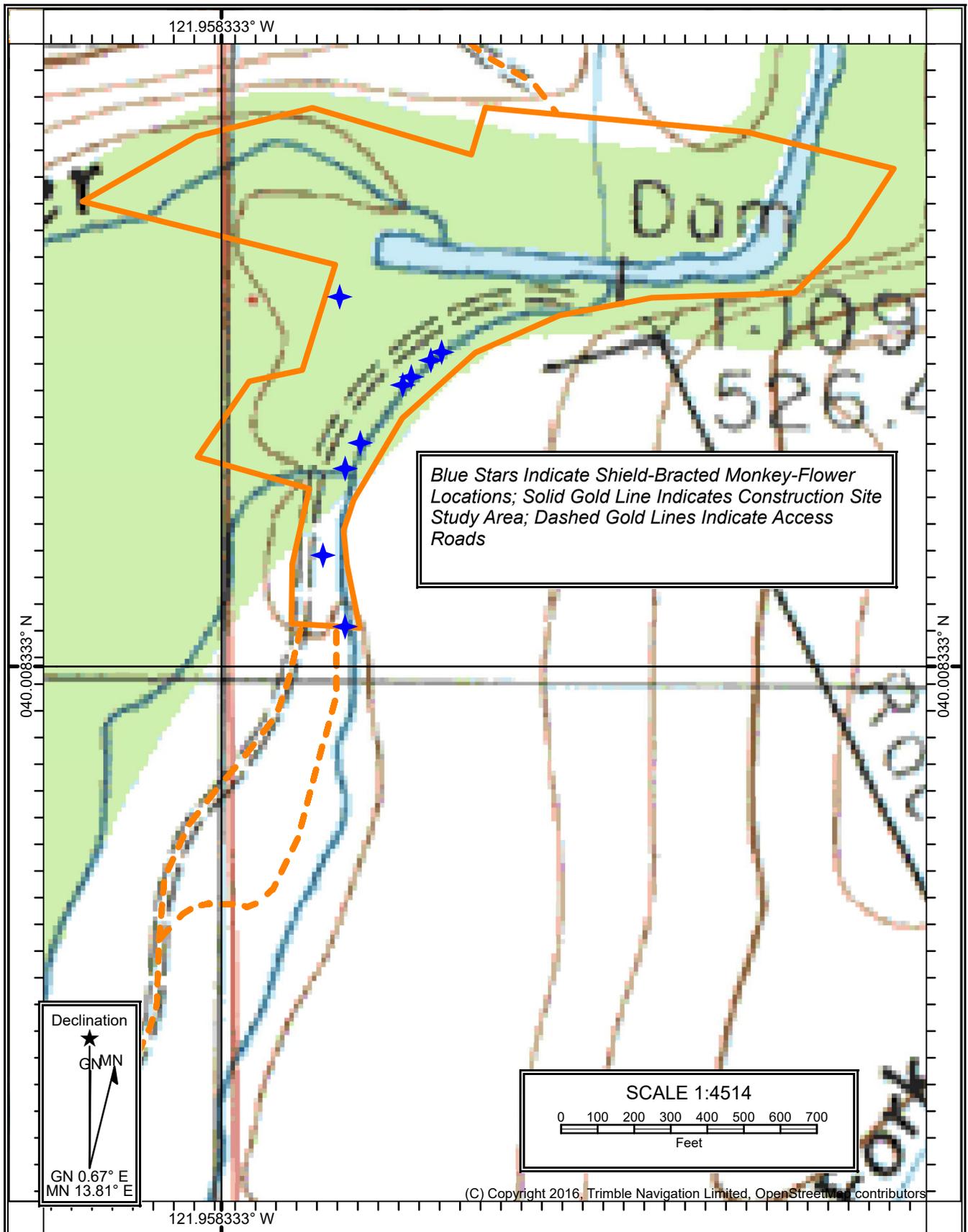


Figure 7. Shield-Bracted Monkey-Flower (*Erythranthe glaucescens*; CNPS Rank 4.3); Deer Creek DCID Dam Fish Passage Project; Tehama County, CA; Survey Conducted by John Dittes on April 25, May 4, and December 19, 2018

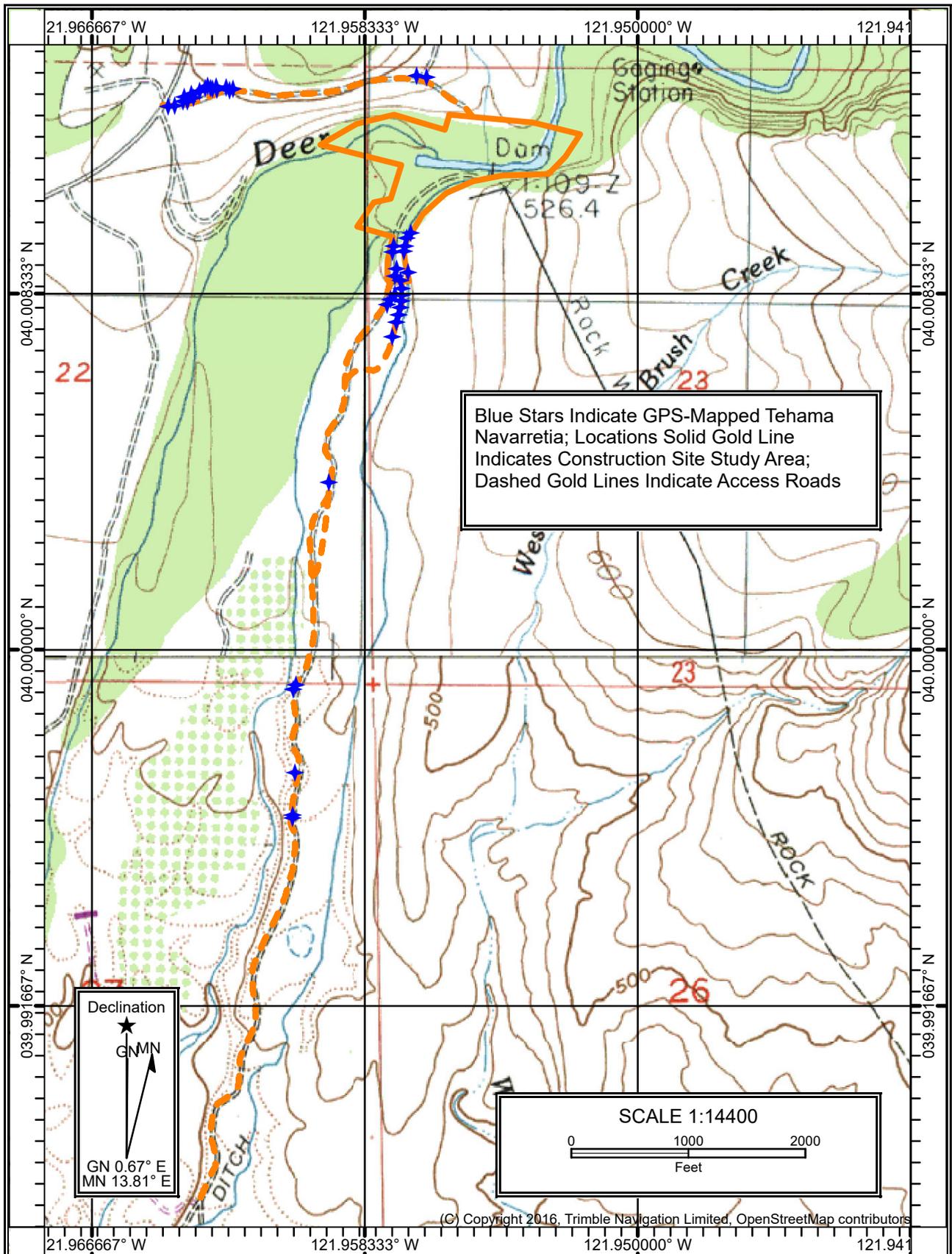


Figure 8. Tehama Navarretia (*Navarretia heterandra*; CNPS Rank 4.3); Deer Creek DCID Dam Fish Passage Project; Tehama County, CA; Survey conducted by John Dittes on April 25, May 4, & December 19, 2018

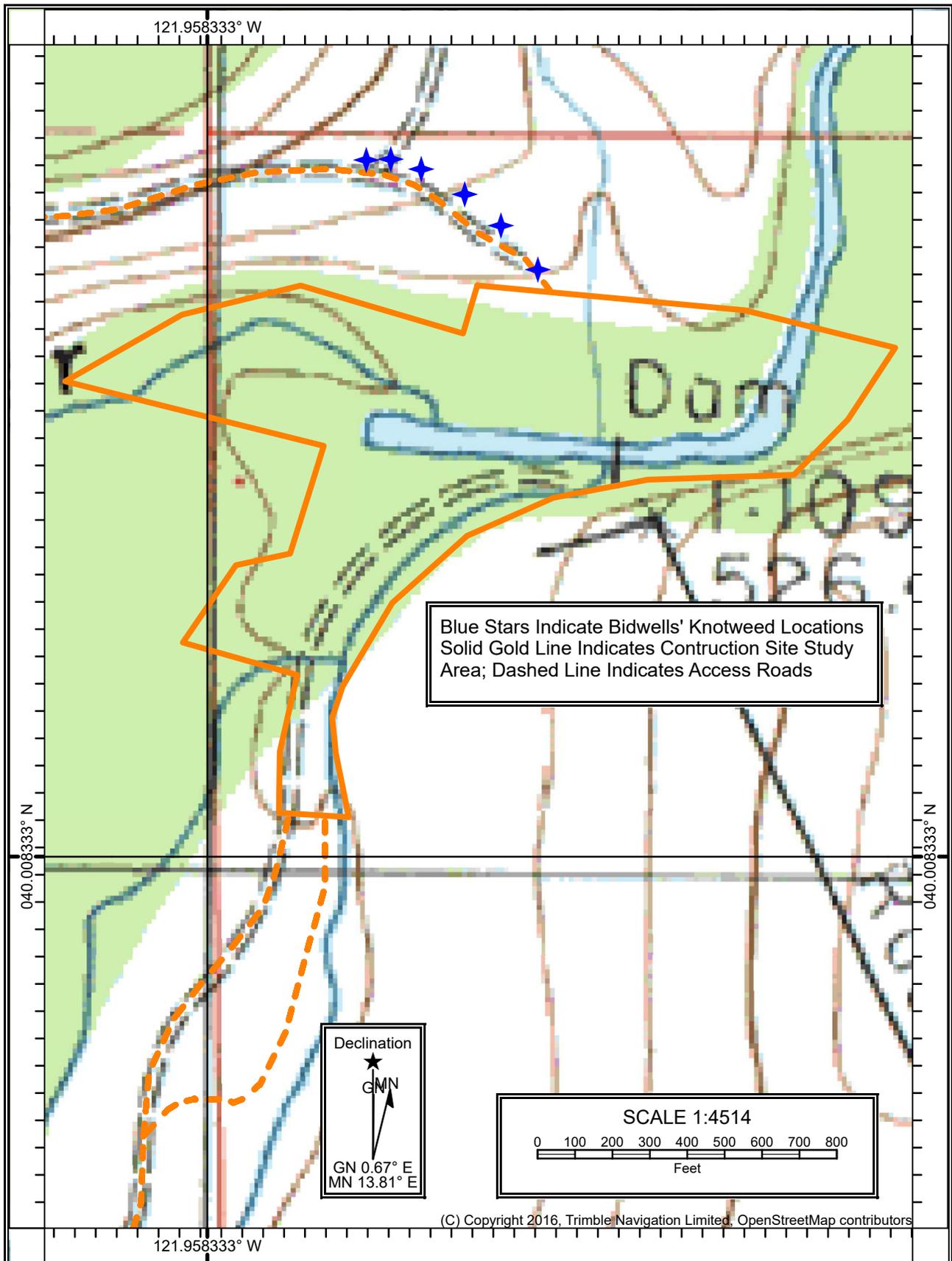


Figure 9. Bidwell's Knotweed (*Polygonum bidwelliae*; CNPS Rank 4.3); Deer Creek DCID Dam Fish Passage Project; Tehama County, CA; Survey Conducted by John Dittes on April 25, May 4, and December 19, 2018

Appendix 1: Special-status Plant Species with Potential to Occur at the Deer Creek DCID Dam Fish Passage Project, Tehama County, California

| <i>Scientific Name</i> Common Name | CNPS Rank | Geographic Range | Elevation (meters) | Habitat/Plant Community Associations | Flowering Period |
|---|-----------------------|---|---------------------------|---|-------------------------|
| <i>Allium sanbornii</i> var. <i>sanbornii</i> Sanborn's Onion | 4.2 S3S4 G4T3T4 | Butte, Calaveras, Eldorado, Nevada, Placer, Shasta, Tehama, Tuolumne, and Yuba counties; Oregon | 260 to 1,510 | Usually serpentinite, gravelly; Chaparral, Cismontane Woodland and Lower Montane Coniferous Forest | May - September |
| <i>Astragalus pauperculus</i> Depauperate Milk-vetch | 4.3 S4 G4 | Butte, Placer, Shasta, Tehama, and Yuba counties | 60 to 1,215 | Vernally mesic, volcanic; Chaparral, Cismontane Woodland and Valley and Foothill Grasslands | March - June |
| <i>Astragalus tener</i> var. <i>ferrisiae</i> Ferris' Milk-vetch | 1B.1 S1 G2T1 | Butte, Contra Costa, Colusa, Glenn, Solano*, Sutter, and Yolo counties | 2 to 75 | Meadows and Seeps (vernally mesic), Valley and Foothill Grasslands, Sub-alkaline Flats | April - May |
| <i>Calochortus syntrophus</i> Callahan's Mariposa Lily | 1B.1 S1 G1 | Shasta and Tehama counties | 525 to 1,145 | Cismontane Woodland and Valley and Foothill Grasslands | May - June |
| <i>Calycadeia oppositifolia</i> Butte County Calycadenia | 4.2 S3 G3 | Butte County | 90 to 945 | Openings, volcanic, serpentinite, granitic; Chaparral, Cismontane Woodland, Meadows and Seeps, and Valley and Foothill Grasslands | April - July |
| <i>Calystegia atriplicifolia</i> ssp. <i>buttensis</i> Butte County Morning-glory | 4.2 S3 G5T3 | Butte, Del Norte, Mendocino (?), Shasta, and Tehama counties | 565 to 1,524 | Rocky, sometimes roadside; Chaparral and Lower Montane Coniferous Forest | May - July |
| <i>Campylopodiella stenocarpa</i> Flagella-like Atractylocarpus | 2B.2 S1? G5 | Butte and Trinity counties; Elsewhere in U.S. | 100 to 500 | Cismontane Woodland | n/a |
| <i>Castilleja rubicundula</i> var. <i>rubicundula</i> Pink Creamsacs | 1B.2 S2 G5T2 | Butte, Contra Costa, Colusa, Glenn, Lake, Napa, Santa Clara, and Shasta counties | 90 - 910 | Serpentinite | April - June |
| <i>Clarkia gracilis</i> ssp. <i>albicaulis</i> | 1B.2 S2S3 | California endemic: Butte, Lake, and Tehama counties | 245-1,085 | Sometimes serpentinite | May - July |

| <i>Scientific Name</i> Common Name | CNPS Rank | Geographic Range | Elevation (meters) | Habitat/Plant Community Associations | Flowering Period |
|--|------------------------------|---|---------------------------|---|-------------------------|
| White-stemmed Clarkia | G5T2T3 | | | Chaparral and Cismontane Woodland | |
| <i>Cryptantha crinata</i> Silky Cryptantha | 1B.2 S2 G2 | Shasta and Tehama counties | 61 to 1,215 | Gravelly streambeds; Cismontane Woodland, Lower Montane Coniferous Forest, Riparian Forest, Riparian Woodland, and Valley and Foothill Grasslands | April - May |
| <i>Downingia pusilla</i> Dwarf Downingia | 2B.2 S2 GU | Amador, Fresno, Merced, Napa, Placer, Sacramento, San Joaquin, Solano, Sonoma, Stanislaus, Tehama, and Yuba counties; South America | 1 to 445 | Valley and Foothill Grasslands (mesic) and Vernal Pools | March - May |
| <i>Erythranthe glaucescens</i> Shield-bracted Monkeyflower | 4.3 S3S4 G3G4 | Butte, Colusa, Lake, Nevada, Shasta, and Tehama counties | 60 to 1,240 | Serpentinite seeps, sometimes streambanks; Chaparral, Cismontane Woodland, Lower Montane Coniferous Forest and Valley and Foothill Grasslands | February - September |
| <i>Euphorbia hooveri</i> Hoover's Spurge | FT NL 1B.2 S1 G1 | Butte, Colusa, Glenn, Merced, Stanislaus, Tehama, and Tulare counties | 20 to 250 | Vernal Pools | July - October |
| <i>Fritillaria eastwoodiae</i> Butte County Fritillary | 3.2 S3 G3Q | Butte, Eldorado, Nevada, Placer, Shasta, Tehama, and Yuba counties; Oregon | 50 to 1,500 | Sometimes serpentinite; Chaparral, Cismontane Woodland and Lower Montane Coniferous Forest (openings) | March - June |
| <i>Fritillaria pluriflora</i> Adobe Lily | 1B.2 S2S3 G2G3 | Butte, Colusa, Glenn, Lake, Napa, Solano, Tehama, and Yolo counties | 60 to 705 | Often adobe; Chaparral, Cismontane Woodland and Valley and Foothill Grasslands | February - April |
| <i>Gratiola heterosepala</i> Boggs Lake Hedge Hyssop | NL CE 1B.2 S2 G2 | Fresno, Lake, Lassen, Madera, Merced, Modoc, Placer, Sacramento, Shasta, Siskiyou, San Joaquin, Solano, and Tehama counties | 10 to 2,375 | Clay; Marshes and Swamps (lake margin) and Vernal Pools | April - August |
| <i>Hesperivax caulescens</i> Hogwallow Starfish | 4.2 S3 G3 | Alameda, Amador, Butte, Colusa, Contra Costa, Fresno, Glenn, Kern, Merced, Monterey, Napa*, Sacramento, San Diego*, | 0 to 505 | Valley and Foothill Grasslands (mesic, clay) and Vernal Pools (shallow) | March - June |

| <i>Scientific Name</i> Common Name | CNPS Rank | Geographic Range | Elevation (meters) | Habitat/Plant Community Associations | Flowering Period |
|---|--------------------------------|--|-----------------------|--|------------------|
| | | San Joaquin, San Luis Obispo, Stanislaus, Sutter, Tehama and Yolo counties | | | |
| <i>Hibiscus lasiocarpus</i> var. <i>occidentalis</i> Woolly Rose-mallow | 1B.2 S3 G5T3 | Butte, Contra Costa, Colusa, Glenn, Sacramento, San Joaquin, Solana, Sutter and Yolo counties | 0 to 120 | Often on Rip-rap on sides of levees; Marshes and Swamps (freshwater) | June - September |
| <i>Imperata brevifolia</i> California Satintail | 2B.1 S3 G4 | Butte, Fresno, and Imperial counties; and elsewhere | 0 to 1,215 | Mesic; Chaparral, Coastal Scrub and Mojave Desert | May - September |
| <i>Juncus leiospermus</i> var. <i>leiospermus</i> Red Bluff Dwarf Rush | 1B.1 S2 G2T2 | Butte, Placer, Shasta and Tehama counties | 35 to 1,250 | Valley and Foothill Grasslands (mesic) | March - June |
| <i>Lasthenia glabrata</i> ssp. <i>coulteri</i> Coulter's Goldfields | 1B.1 S2 G4T2 | Colusa, Kern (*), Los Angeles (*), Merced, Orange, Riverside, Santa Barbara, San Bernardino (*), San Diego, San Luis Obispo, Tehama, Tulare (?), Ventura, and Yolo counties; Santa Rosa Island | 1 to 1,220 | Marshes and Swamps, Coastal Salt Playas and Vernal pools | February - June |
| <i>Limnanthes floccosa</i> ssp. <i>californica</i> Butte County Meadowfoam | FE CE 1B.1 S1 G4T1 | Butte | 46 to 930 | Valley and Foothill Grasslands (mesic) and vernal pools | March - May |
| <i>Limnanthes floccosa</i> ssp. <i>floccosa</i> Woolly Meadowfoam | 4.2 S3 G4T4 | Butte, Lake, Lassen, Napa, Shasta, Siskiyou, Tehama, and Trinity counties; Oregon | 60 to 1,335 | Vernally mesic; Chaparral, Cismontane Woodland, Valley and Foothill Grasslands and Vernal Pools | March - June |
| <i>Monardella venosa</i> Veiny monardella | 1B.1 S1 G1 | Butte, Sutter (*), Tuolumne, and Yuba counties | 60 to 410 | Heavy clay; Cismontane Woodland and Valley and Foothill Grasslands | May - July |
| <i>Navarretia heterandra</i> Tehama Navarretia | 4.3 S4 G4 | Butte, Colusa, Lake, Napa, Shasta, Tehama, Trinity, and Yuba counties; Oregon | 30 to 1,010 | Valley and Foothill Grasslands (mesic), Vernal Pools | April - June |
| <i>Navarretia nigelliformis</i> ssp. <i>nigelliformis</i> Adobe Navarretia | 4.2 S3 G4T3 | Alameda, Butte, Contra Costa, Colusa, Fresno, Kern, Merced, Monterey, Placer, Sutter, and Tulare counties | 100 to 1,000 | Clay, sometimes serpentinite; Valley and Foothill Grasslands, vernal pools sometimes | April - June |

| <i>Scientific Name</i> Common Name | CNPS Rank | Geographic Range | Elevation (meters) | Habitat/Plant Community Associations | Flowering Period |
|--|------------------------------|---|--------------------|--|------------------|
| <i>Navarretia subuligera</i> Awl-leaved Navarretia | 4.3 S4 G4 | Amador, Butte, Del Norte, Lake, Mendocino, Modoc, Napa, Shasta and Tehama counties: Oregon | 150 to 1,100 | Rocky, mesic; Chaparral, Cismontane Woodland, Lower Montane Coniferous Forest | April - August |
| <i>Orcuttia pilosa</i> Hairy Orcutt Grass | FE CE 1B.1 S1 G1 | Butte, Glenn, Madera, Merced, Stanislaus, and Tehama | 46 to 200 | Vernal pools | May-Sept |
| <i>Orcuttia tenuis</i> Slender Orcutt Grass | FT CE 1B.1 S2 G2 | Butte, Lake, Lassen, Modoc, Plumas, Sacramento, Shasta, Siskiyou, and Tehama | 35 to 1,760 | Vernal Pools (often gravelly) | May-October |
| <i>Paronychia ahartii</i> Ahart's Paronychia | 1B.1 S3 G3 | Butte, Shasta and Tehama counties | 30 to 510 | Cismontane Woodland, Valley and Foothill Grasslands and Vernal Pools | February - June |
| <i>Polygonum bidwelliae</i> Bidwell's Knotweed | 4.3 S4 G4 | Butte, Shasta, and Tehama counties | 60 to 1,200 | Chaparral, Cismontane Woodland and Valley and Foothill Grasslands | April - July |
| <i>Rhynchospora californica</i> California Beaked-rush | 1B.1 S1 G1 | Butte, Marin, Napa, and Sonoma counties | 45 to 1,010 | Bogs and Fens, Lower Montane Coniferous Forest, Meadows and Seeps, and Marshes and Swamps (freshwater) | May - July |
| <i>Sagittaria sanfordii</i> Sanfords Arrowhead | 1B.2 S3 G3 | Butte, Del Norte, Eldorado, Fresno, Mariposa, Merced, Orange*, Placer, Sacramento, San Bernardino, San Joaquin, Shasta, Solano, Tehama, Ventura*, and Yuba counties | 0 to 650 | Marshes and Swamps (assorted shallow freshwater) | May - November |
| <i>Sidalcea robusta</i> Butte County Checkerbloom | 1B.2 S2 G2 | Butte County | 90 to 1,600 | Chaparral and Cismontane Woodlands | April - June |
| <i>Tuctoria greenei</i> Greene's Tuctoria | FE CR 1B.1 S1 G1 | Butte, Colusa, Fresno*, Glenn, Madera*, Merced, Modoc, Shasta, San Joaquin*, Stanislaus*, Tehama, and Tulare* | 30 to 1,070 | Vernal pools | May-Sept |

*** Status Codes: California Rare Plant Rank:**

1B: Plants Rare, Threatened, or Endangered in CA and elsewhere

2B: Plants Rare, Threatened or Endangered in CA but more common elsewhere

3: More Information Needed

4: Plants of Limited Distribution-A watch list

0.1: Seriously Threatened in California (over 80% of occurrences / high degree and immediacy of threat

0.2: Moderately Threatened in California (20-80% / Moderate degree and immediacy of threat

0.3 Not very threatened in California (less than 20% of occurrences) / Low degree or no current threats known

* = May be extirpated from County; (?) = Uncertain about distribution or identity

Global Ranking

G1 = Critically Imperiled- At a very high risk of extinction due to extreme rarity (often 5 or fewer populations), very steep declines, or other factors.

G2 = Imperiled- At high risk of extinction due to very restricted range, very few population (often 20 or fewer), steep declines, or other factors.

G3 = Vulnerable – At moderate risk of extinction due to a restricted range, relatively few population (often 80 or fewer), recent and widespread declines, or other factors.

G4 = Apparently Secure – Uncommon but not rare; some cause for long term concern due to declines or other factors

G5 = Secure – Common; widespread and abundant.

Other Global Symbols

Q = The element is very rare, but there are taxonomic questions associated with it.

T = T- Rank reflects the global situation of just the subspecies or variety.

State Ranking

S1 = State Ranking – Critically Imperiled- Critically imperiled in the state because of extreme rarity (often 5 or fewer populations) or because of factor(s) such as steep declines making it especially vulnerable to extirpation from the state.

S2 = State Ranking – Imperiled- Imperiled in the state because of rarity due to a very restricted range, very few population (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the state.

S3 = State Ranking – Vulnerable – Vulnerable in the state due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines or other factors making it vulnerable to extirpation from the state.

S4 = Apparently Secure – Uncommon but not rare in the state; some cause for long-term concern due to declines or other factors.

S5 = Secure – Common, widespread, and abundant in the state.

Appendix B-Table 2. Vascular Plant Species Identified During 2018 Field Survey; Deer Creek DCID Dam Fish Passage Project; Tehama County, CA; Surveys and Species ID by John Dittes

| SCIENTIFIC NAME | | | | Native / Introduced | COMMON NAME |
|-------------------------|------------------------|------|----------------------|---------------------|--|
| ADOXACEAE | | | | | MUSKROOT FAMILY |
| <i>Sambucus</i> | <i>nigra</i> | ssp. | <i>caerulea</i> | N | Blue Elderberry |
| AGAVACEAE | | | | | AGAVE FAMILY |
| <i>Chlorogalum</i> | <i>angustifolium</i> | | | N | Narrow-leaved Soap-plant |
| <i>Chlorogalum</i> | <i>pomeridianum</i> | var. | <i>pomeridianum</i> | N | Wavy-leaved Soap-plant |
| ALLIACEAE | | | | | ONION FAMILY |
| <i>Allium</i> | <i>amplectens</i> | | | N | Clasping Onion |
| ANACARDIACEAE | | | | | SUMAC FAMILY |
| <i>Rhus</i> | <i>aromatica</i> | | | N | Skunkbrush |
| <i>Toxicodendron</i> | <i>diversilobum</i> | | | N | Western Poison-oak |
| APIACEAE | | | | | CARROT FAMILY |
| <i>Eryngium</i> | <i>castrense</i> | | | N | Coyote Thistle |
| <i>Sanicula</i> | <i>bipinnatifida</i> | | | N | Purple Sanicle |
| <i>Sanicula</i> | <i>bipinnata</i> | | | N | Poison Sanicle |
| <i>Torilis</i> | <i>arvensis</i> | | | I | Tall Sock-destroyer |
| APOCYNACEAE | | | | | DOGBANE FAMILY |
| <i>Apocynum</i> | <i>cannabinum</i> | | | N | Indian Hemp |
| <i>Asclepias</i> | <i>eriocarpa</i> | | | N | Indian Milkweed |
| <i>Asclepias</i> | <i>fascicularis</i> | | | N | Narrow-leaved Milkweed |
| ARISTOLOCHIACEAE | | | | | GINSENG FAMILY |
| <i>Aristolochia</i> | <i>californica</i> | | | N | California Pipevine |
| ASTERACEAE | | | | | SUNFLOWER FAMILY |
| <i>Achyrachaena</i> | <i>mollis</i> | | | N | Blow-wives |
| <i>Agoseris</i> | <i>heterophylla</i> | | | N | Annual Agoseris |
| <i>Artemisia</i> | <i>californica</i> | | | N | Mugwort |
| <i>Baccharis</i> | <i>glutinosa</i> | | | N | Mulefat |
| <i>Bidens</i> | <i>frondosa</i> | | | N | Sticktight |
| <i>Brickellia</i> | <i>californica</i> | | | N | California Bricklebrush |
| <i>Calycadenia</i> | <i>prob. fremontii</i> | | | N | Pre-flowering Tarweed (not <i>C. oppositifolia</i>) |
| <i>Calycadenia</i> | <i>truncata</i> | | | N | Rosinweed |
| <i>Carduus</i> | <i>pycnocephalus</i> | var. | <i>pycnocephalus</i> | I | Italian Plumeless Thistle |
| <i>Cirsium</i> | <i>vulgare</i> | | | I | Bull Thistle |
| <i>Centaurea</i> | <i>melitensis</i> | | | I | Tocalote |
| <i>Centaurea</i> | <i>solstitialis</i> | | | I | Yellow Starthistle |
| <i>Centromadia</i> | <i>fitchii</i> | | | N | Fitch's Spikeweed |
| <i>Cichorium</i> | <i>intybus</i> | | | I | Chicory |
| <i>Erigeron</i> | <i>canadensis</i> | | | N | Canadian Horseweed |
| <i>Eriophyllum</i> | <i>lanatum</i> | var. | <i>grandiflorum</i> | N | Large-flowered Woolly-sunflower |
| <i>Europappus</i> | <i>lindleyi</i> | | | N | Silverpuffs |
| <i>Euthamia</i> | <i>occidentalis</i> | | | N | Western Goldenrod |
| <i>Gnaphalium</i> | <i>palustre</i> | | | N | Western Cudweed |
| <i>Grindelia</i> | <i>hirsutala</i> | var. | <i>davyi</i> | N | Foothill Gumweed |
| <i>Hesperervax</i> | <i>caulescens</i> | | | N | Hogwallow Starfish |
| <i>Heterotheca</i> | <i>grandiflora</i> | | | N | Telegraph Weed |
| <i>Heterotheca</i> | <i>oregona</i> | var. | <i>compacta</i> | N | Oregon Golden-aster |
| <i>Hypochaeris</i> | <i>glabra</i> | | | I | Smooth Cat's-ear |
| <i>Lagophylla</i> | <i>sp.</i> | | | N | Hareleaf |
| <i>Lasthenia</i> | <i>californica</i> | | | N | California Goldfields |
| <i>Lasthenia</i> | <i>fremontii</i> | | | N | Fremont's Goldfields |
| <i>Layia</i> | <i>fremontii</i> | | | N | Fremont's Tidytops |
| <i>Leontodon</i> | <i>saxatillis</i> | | | I | Long-beaked Hawkbit |
| <i>Lessingia</i> | <i>nana</i> | | | N | Dwarf Lessingia |
| <i>Logfia</i> | <i>gallica</i> | | | N | Narrow-leaved Filago |
| <i>Madia</i> | <i>gracilis</i> | | | N | Slender Tarweed |
| <i>Matricaria</i> | <i>discoidea</i> | | | I | Common Pineapple-weed |
| <i>Micropus</i> | <i>californicus</i> | var. | <i>californicus</i> | N | Slender Cottonweed |
| <i>Microseris</i> | <i>acuminata</i> | | | N | Sierra Foothill Microseris |
| <i>Microseris</i> | <i>douglasii</i> | ssp. | <i>doulassi</i> | N | Douglas' Microseris |
| <i>Pseudognaphalium</i> | <i>luteoalbum</i> | | | I | Weedy Cudweed |
| <i>Psilocarphus</i> | <i>brevissimus</i> | var. | <i>brevissimus</i> | N | Dwarf Woolly-marbles |
| <i>Psilocarphus</i> | <i>oregonus</i> | | | N | Oregon Woolly-marbles |
| <i>Senecio</i> | <i>vulgare</i> | | | I | Old Man of Spring |
| <i>Silybum</i> | <i>marianum</i> | | | I | Milk-thistle |
| <i>Solidago</i> | <i>velutina</i> | ssp. | <i>californica</i> | N | California Goldenrod |
| <i>Sonchus</i> | <i>asper</i> | ssp. | <i>asper</i> | I | Prickly Sow Thistle |
| <i>Xanthium</i> | <i>strumarium</i> | | | N | Cocklebur |

Appendix B-Table 2. Vascular Plant Species Identified During 2018 Field Survey; Deer Creek DCID Dam Fish Passage Project; Tehama County, CA; Surveys and Species ID by John Dittes

| | | | | | |
|------------------------|-------------------------------|------|-------------------|---|---------------------------------------|
| BETULACEAE | | | | | BIRCH FAMILY |
| <i>Alnus</i> | <i>rhombofolia</i> | | | N | White Birch |
| BLECHNACEAE | | | | | CHAIN FERN FAMILY |
| <i>Woodwardia</i> | <i>fimbriata</i> | | | N | Giant Chain Fern |
| BORAGINACEAE | | | | | BORAGE FAMILY |
| <i>Amsinckia</i> | <i>menziesii</i> | | | N | Menzie's Fiddleneck |
| <i>Amsinckia</i> | <i>intermedia</i> | | | N | Common Fiddleneck |
| <i>Cryptantha</i> | <i>flaccida</i> | | | N | Weak-stemmed Cryptantha |
| <i>Heliotropium</i> | <i>curassavicum</i> | var. | <i>oculatum</i> | N | California Yerba-santa |
| <i>Myosotis</i> | sp. | | | | Forget-me-not |
| <i>Phacelia</i> | <i>egena</i> | | | N | Rock Phacelia |
| <i>Plagiobothrys</i> | <i>canescens</i> | | | N | Valley Popcorn-flower |
| <i>Plagiobothrys</i> | <i>nothofulvus</i> | | | N | Common Popcorn-flower |
| <i>Plagiobothrys</i> | <i>stipitatus</i> | var. | <i>micranthus</i> | N | Small-flowered Popcorn-flower |
| BRASSICACEAE | | | | | MUSTARD FAMILY |
| <i>Athysanus</i> | <i>pusillus</i> | | | N | Petty Athysanus |
| <i>Hirschfeldia</i> | <i>incana</i> | | | I | Hoary Mustard |
| <i>Lepidium</i> | <i>nitidum</i> | | | N | Shiny Pepper-grass |
| <i>Nasturtium</i> | <i>officinale</i> | | | N | Watercress |
| <i>Sisymbrium</i> | <i>officinale</i> | | | I | Hedge-mustard |
| <i>Thysanocarpus</i> | <i>curvipes</i> | | | N | Spokepod |
| CALYCANTHACEAE | | | | | CALYCANTHUS FAMILY |
| <i>Calycanthus</i> | <i>occidentalis</i> | | | N | Western Spicebush |
| CAPRIFOLIACEAE | | | | | HONESUCKLE FAMILY |
| <i>Lonicera</i> | <i>interrupta</i> | | | N | Chaparral Honeysuckle |
| <i>Symphoricarpos</i> | <i>albus</i> | var. | <i>laevigatus</i> | N | Common Snowberry |
| CARYOPHYLLACEAE | | | | | |
| <i>Cerastium</i> | <i>glomeratum</i> | | | I | Sticky Mouse-eared Chickweed |
| <i>Herniaria</i> | <i>hirsuta</i> | var. | <i>hirsuta</i> | I | Herniaria |
| <i>Minuartia</i> | <i>californica/cismontana</i> | | | N | Sandwort (dried) |
| <i>Petrorhagia</i> | <i>dubia</i> | | | I | Grass Pink |
| <i>Scleranthus</i> | <i>annuus</i> | | | I | Knawel |
| <i>Silene</i> | <i>gallica</i> | | | I | Windmill-pink |
| <i>Spergularia</i> | <i>rubra</i> | | | I | Ruby Sandspurry |
| <i>Stellaria</i> | <i>media</i> | | | I | Common Chickweed |
| <i>Stellaria</i> | <i>pallida</i> | | | I | Pallid Starwort |
| CONVOLVULACEAE | | | | | MORNING-GLORY FAMILY |
| <i>Convolvulus</i> | <i>arvensis</i> | | | I | Bindweed |
| CRASSULACEAE | | | | | STONECROP FAMILY |
| <i>Crassula</i> | <i>connata</i> | | | N | Pygmyweed |
| <i>Dudleya</i> | <i>cymosa</i> | ssp. | <i>cymosa</i> | N | Canyon Dudleya |
| <i>Sedella</i> | <i>pumila</i> | | | N | Dwarf Stonecrop |
| CUPRESSACEAE | | | | | CYPRESS FAMILY |
| <i>Juniperus</i> | <i>californica</i> | | | N | California Juniper |
| CYPERACEAE | | | | | SEDGE FAMILY |
| <i>Carex</i> | <i>nudata</i> | | | N | Torrent Sedge |
| <i>Cyperus</i> | <i>eragrostis</i> | | | N | Tall Cyperus |
| <i>Eleocharis</i> | <i>macrostachya</i> | | | N | Pale Spike-rush |
| <i>Eleocharis</i> | sp. | | | N | Spike-rush |
| <i>Scirpus</i> | <i>microcarpus</i> | | | N | Small-fruit Bulrush |
| EQUISETACEAE | | | | | HORSETAIL FAMILY |
| <i>Equisetum</i> | <i>arvensis</i> | | | N | Common Horsetail |
| <i>Equisetum</i> | <i>hyemale</i> | ssp. | <i>affine</i> | N | Common Scouring-rush |
| ERICACEAE | | | | | HEATH & WINTERGREEN FAMILY |
| <i>Arctostaphylos</i> | sp. | | | | Manzanita |
| EUPHORBIACEAE | | | | | SPURGE FAMILY |
| <i>Chamaesyce</i> | <i>maculata</i> | | | I | Spotted Spurge |
| <i>Croton</i> | <i>setigerus</i> | | | N | Turkey-mullein |
| FABACEAE | | | | | PEA FAMILY |
| <i>Acmispon</i> | <i>americanus</i> | var. | <i>americanus</i> | N | Spanish Lotus |
| <i>Acmispon</i> | <i>parviflorus</i> | | | N | Small-flowered Lotus |
| <i>Cercis</i> | <i>occidentalis</i> | | | N | Western Redbud |
| <i>Lotus</i> | <i>corniculatus</i> | | | I | Bird's-foot Trefoil |
| <i>Lupinus</i> | <i>albufrons</i> | | | N | Silver Bush Lupine |
| <i>Lupinus</i> | <i>bicolor</i> | | | N | Bicolored Lupine |
| <i>Medicago</i> | <i>polymorpha</i> | | | I | California or Common Bur-clover |
| <i>Melilotus</i> | <i>albus</i> | | | I | White Sweet-clover |
| <i>Trifolium</i> | <i>depauperatum</i> | | ? | N | Cowbag Clover |

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| | | | | | |
|-------------------------|----------------------------|------|----------------------|---|--------------------------------|
| <i>Trifolium</i> | <i>ciliolatum</i> | | | N | Foothill Clover |
| <i>Trifolium</i> | <i>dubium</i> | | | I | Little Hop Clover |
| <i>Trifolium</i> | <i>glomeratum</i> | | | I | Sessile-headed Clover |
| <i>Trifolium</i> | <i>hirtum</i> | | | I | Rose Clover |
| <i>Trifolium</i> | <i>microcephalum</i> | | | N | Small-headed Clover |
| <i>Trifolium</i> | <i>repens</i> | | | I | White Clover |
| <i>Trifolium</i> | <i>variegatum</i> | | | N | White-tipped Clover |
| <i>Trifolium</i> | <i>wildenovii</i> | | | N | Tomcat Clover |
| <i>Vicia</i> | <i>villosa</i> | | | I | Winter Vetch |
| FAGACEAE | | | | | OAK FAMILY |
| <i>Quercus</i> | <i>douglasii</i> | | | N | Blue Oak |
| <i>Quercus</i> | <i>lobata</i> | | | N | Valley Oak |
| <i>Quercus</i> | <i>wislizenii</i> | var. | <i>wislizeni</i> | N | Interior Live Oak |
| GENTIANACEAE | | | | | GENTIAN FAMILY |
| <i>Centaurium</i> | <i>tenuiflorum</i> | | | I | June Centaury |
| <i>Zeltnera</i> | <i>venusta</i> | | | N | Charming Centaury |
| GERANIACEAE | | | | | GERANIUM FAMILY |
| <i>Erodium</i> | <i>botrys/brachycarpum</i> | | | I | Long-beaked Stork's-bill |
| <i>Erodium</i> | <i>cicutarium</i> | | | I | Red-stemmed Filaree |
| <i>Erodium</i> | <i>moschatum</i> | | | I | White-stemmed Filaree |
| <i>Geranium</i> | <i>carolinianum</i> | | | I | Carolina Geranium |
| <i>Geranium</i> | <i>molle</i> | | | I | Dove's-foot Geranium |
| HYDROCHARITACEAE | | | | | WATERWEED FAMILY |
| <i>Elodea</i> | <i>canadensis</i> | | | N | Canadian Waterweed |
| HYPERICACEAE | | | | | ST. JOHN'S-WORT FAMILY |
| <i>Hypericum</i> | <i>anagalloides</i> | | | I | Tinker's-penny |
| <i>Hypericum</i> | <i>perforatum</i> | | | I | Klamathweed |
| JUNCACEAE | | | | | RUSH FAMILY |
| <i>Juncus</i> | <i>balticus</i> | ssp. | <i>ater</i> | N | Baltic Rush |
| <i>Juncus</i> | <i>bufonius</i> | var. | <i>bufonius</i> | N | Common Toad Rush |
| <i>Juncus</i> | <i>effusus</i> | | | N | Pacific Rush |
| LAMIACEAE | | | | | MINT FAMILY |
| <i>Lamium</i> | <i>amplexicaule</i> | | | I | Giraffe's Head |
| <i>Marrubium</i> | <i>vulgare</i> | | | I | Horehound |
| <i>Pogogyne</i> | <i>zizyphoroides</i> | | | N | Sacramento Valley Pogogyne |
| <i>Stachys</i> | <i>sp.</i> | | | N | Pre-flowering Hedge-nettle |
| <i>Trichostema</i> | <i>lanceolatum</i> | | | N | Vinegar-weed |
| <i>Umbellularia</i> | <i>californica</i> | | | N | California Bay |
| LILIACEAE | | | | | LIULY FAMILY |
| <i>Calochortus</i> | <i>luteus</i> | | | N | Yellow Mariposa Lily |
| LYTHRACEAE | | | | | LOOSESTRIFE FAMILY |
| <i>Lythrum</i> | <i>hyssopifolium</i> | | | I | Hyssop Loosestrife |
| MONTIACEAE | | | | | PURSELANE FAMILY |
| <i>Claytonia</i> | <i>parviflora</i> | | | N | Small-flowered Miner's Lettuce |
| MORACEAE | | | | | MULBERRY FAMILY |
| <i>Ficus</i> | <i>carica</i> | | | I | Edible Fig |
| MYRSINACEAE | | | | | MYRSINE FAMILY |
| <i>Anagallis</i> | <i>arvensis</i> | | | I | Scarlet Pimpernel |
| OLEACEAE | | | | | OLIVE FAMILY |
| <i>Fraxinus</i> | <i>latifolia</i> | | | N | Oregon Ash |
| ONAGRACEAE | | | | | EVENING PRIMROSE FAMILY |
| <i>Clarkia</i> | <i>purpurea</i> | ssp. | <i>quadrivulnera</i> | N | Purple Clarkia |
| <i>Clarkia</i> | <i>unguiculata</i> | | | N | Elegant Clarkia |
| <i>Epilobium</i> | <i>ciliatum</i> | | | N | Willowherb |
| <i>Epilobium</i> | <i>cleistogamnum</i> | | | N | Cleistogamous Spike-primrose |
| <i>Epilobium</i> | <i>brachycarpum</i> | | | N | Tall Annual Willowherb |
| <i>Epilobium</i> | <i>torreyi</i> | | | N | Torrey's Spike-primrose |
| <i>Ludwigia</i> | <i>peploides</i> | ssp. | <i>peploides</i> | N | Yellow Waterweed |
| OROBANCHACEAE | | | | | BROOMRAPE FAMILY |
| <i>Castilleja</i> | <i>attenuata</i> | | | N | Valley Tassel |
| <i>Triphysaria</i> | <i>eriantha</i> | ssp. | <i>eriantha</i> | N | Johnnytuck |
| PAPAVERACEAE | | | | | POPPY FAMILY |
| <i>Eschscholzia</i> | <i>californica</i> | | | N | California Poppy |
| <i>Eschscholzia</i> | <i>lobbii</i> | | | N | Fryingpan Poppy |
| PHRYMACEAE | | | | | LOPSEED FAMILY |
| <i>Erythranthe</i> | <i>glaucescens</i> | | | N | Shield-bracted Monkey-flower |
| <i>Erythranthe</i> | <i>gutattus</i> | | | N | Seep Monkey-flower |
| PINACEAE | | | | | PINE FAMILY |

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| | | | | | |
|------------------------------|----------------------|------|---------------------|---|---------------------------|
| <i>Pinus</i> | <i>sabiniana</i> | | | N | Foothill Pine |
| PLANTAGINACEAE | | | | | PLANTAIN FAMILY |
| <i>Plantago</i> | <i>coronopus</i> | | | I | Cut-leaved Plantain |
| <i>Plantago</i> | <i>erecta</i> | | | N | Erect Plantain |
| <i>Plantago</i> | <i>lanceolata</i> | | | I | English Plantain |
| <i>Plantago</i> | <i>elongata</i> | | | N | Elongate Plantain |
| <i>Veronica</i> | <i>peregrina</i> | ssp. | <i>xalapensis</i> | N | Purslane Speedwell |
| PLATANACEAE | | | | | SYCAMORE FAMILY |
| <i>Patanus</i> | <i>racemosa</i> | | | N | Western Sycamore |
| POACEAE | | | | | GRASS FAMILY |
| <i>Aira</i> | <i>caryophyllea</i> | | | I | Silver European Hairgrass |
| <i>Aristida</i> | <i>oligantha</i> | | | N | Three-awn |
| <i>Avena</i> | <i>barbata</i> | | | I | Slender Wild Oat |
| <i>Brachypodium</i> | <i>distachyon</i> | | | I | False Brome |
| <i>Briza</i> | <i>minor</i> | | | I | Lesser Quaking-grass |
| <i>Bromus</i> | <i>hordeaceus</i> | | | I | Soft Chess |
| <i>Bromus</i> | <i>madritensis</i> | ssp. | <i>madritensis</i> | I | Foxtail Chess |
| <i>Bromus</i> | <i>madritensis</i> | ssp. | <i>rubens</i> | I | Red Brome |
| <i>Bromus</i> | <i>sterilis</i> | | | I | Proverty Brome |
| <i>Cynodon</i> | <i>dactylon</i> | | | I | Bermuda Grass |
| <i>Cynosurus</i> | <i>echinatus</i> | | | I | Hedgehog Dogtail |
| <i>Deschampsia</i> | <i>danthonioides</i> | | | N | Annual Hairgrass |
| <i>Elymus</i> | <i>caput-medusae</i> | | | I | Medusa-head |
| <i>Festuca</i> | <i>arundinacea</i> | | | I | Tall Fescue |
| <i>Festuca</i> | <i>perennis</i> | | | I | Annual Ryegrass |
| <i>Festuca</i> | <i>bromoides</i> | | | I | Brome Fescue |
| <i>Festuca</i> | <i>microstachys</i> | | | N | Small Fescue |
| <i>Festuca</i> | <i>myuros</i> | | | I | Rattail Sixweeks Grass |
| <i>Gastridium</i> | <i>phleoides</i> | | | I | Nitgrass |
| <i>Glyceria</i> | <i>declinata</i> | | | I | Low Mannagrass |
| <i>Hordeum</i> | <i>marinum</i> | ssp. | <i>gussoneanum</i> | I | Mediterranean Barley |
| <i>Hordeum</i> | <i>murinum</i> | ssp. | <i>leporinum</i> | I | Hare Wall Barley |
| <i>Koeleria</i> | <i>gerardii</i> | | | I | Bristly Koeler's-grass |
| <i>Muhlenbergia</i> | <i>rigens</i> | | | N | Deergrass |
| <i>Paspalum</i> | <i>dilatatum</i> | | | I | Dallisgrass |
| <i>Poa</i> | <i>annua</i> | | | I | Annual Bluegrass |
| <i>Poa</i> | <i>pratensis</i> | ssp. | | I | Kentucky Blugrass |
| <i>Poa</i> | <i>secunda</i> | ssp. | <i>secunda</i> | N | One-sided Bluegrass |
| <i>Polypogon</i> | <i>monspeliensis</i> | | | I | Annual Beard Grass |
| <i>Stipa</i> | <i>lemmonii</i> | var. | <i>lemmonii</i> | N | Lemmon's Needlegrass |
| POLEMONIACEAE | | | | | PHLOX FAMILY |
| <i>Gilia</i> | <i>tricolor</i> | ssp. | <i>tricolor</i> | N | Bird's-eye Gilia |
| <i>Leptosiphon</i> | <i>ciliatus</i> | | | N | Whiskerbrush |
| <i>Navarretia</i> | <i>heterandra</i> | | | N | Tehama Navarretia |
| <i>Navarretia</i> | <i>leucocephala</i> | ssp. | <i>leucocephala</i> | N | White-flowered Navarretia |
| <i>Navarretia</i> | <i>pubescens</i> | | | N | Downy Navarretia |
| <i>Navarretia</i> | <i>tagetina</i> | | | N | Marigold Navarretia |
| POLYGONACEAE | | | | | BUCKWHEAT FAMILY |
| <i>Chorizanthe</i> | <i>polygonoides</i> | var. | <i>polygonoides</i> | N | Knotweed Spineflower |
| <i>Eriogonum</i> | <i>nudum</i> | var. | <i>pubiflorum</i> | N | Naked-stemmed Buckwheat |
| <i>Polygonum</i> | <i>aviculare</i> | ssp. | <i>depressum</i> | I | Common Knotweed |
| <i>Polygonum</i> | <i>bidwelliae</i> | | | N | Bidwell's Knotweed |
| <i>Pterostegia</i> | <i>drymerioides</i> | | | N | Granny's Hairnet |
| <i>Rumex</i> | <i>acetosella</i> | | | I | Common Sheep Sorrel |
| <i>Rumex</i> | <i>crispus</i> | | | I | Curly Dock |
| POLYPODIACEAE | | | | | POLYPODY FAMILY |
| <i>Polypodium</i> | <i>calirhiza</i> | | | N | Intermediate Polypody |
| PTERIDACEAE | | | | | BRACKEN FAMILY |
| <i>Pentagramma</i> | <i>triangularis</i> | ssp. | <i>triangularis</i> | N | Gold-backed Fern |
| RANUNCULACEAE | | | | | BUTTERVUP FAMILY |
| <i>Delphinium variegatum</i> | | | | N | Royal Larkspur |
| <i>Ranunculus</i> | <i>aquatilis</i> | | | N | Water Buttercup |
| <i>Ranunculus</i> | <i>muricatus</i> | | | I | Prickle-seeded Buttercup |
| RHAMNACEAE | | | | | BUCKTHORN FAMILY |
| <i>Ceanothus</i> | <i>cuneatus</i> | var. | <i>cuneatus</i> | N | Buckbrush |
| <i>Frangula</i> | <i>californica</i> | ssp. | <i>tomentella</i> | N | Hoary Coffeeberry |
| <i>Rhamnus</i> | <i>ilicifolia</i> | | | N | Holly-leaved Redberry |

Appendix B-Table 2. Vascular Plant Species Identified During 2018 Field Survey; Deer Creek DCID Dam Fish Passage Project; Tehama County, CA; Surveys and Species ID by John Dittes

| | | | | | |
|--------------------------|---------------------|------|---------------------|---|---------------------------|
| ROSACEAE | | | | | ROSE FAMILY |
| <i>Aphanes</i> | <i>occidentalis</i> | | | N | Western Lady's-mantle |
| <i>Rosa</i> | <i>californica</i> | | | N | California Rose |
| <i>Rubus</i> | <i>armeniacus</i> | | | I | Himalayan Blackberry |
| <i>Rubus</i> | <i>ursinus</i> | | | N | California Blackberry |
| RUBIACEAE | | | | | MADDER FAMILY |
| <i>Cephalanthus</i> | <i>occidentalis</i> | var. | <i>californicus</i> | N | California Button-willow |
| <i>Galium</i> | <i>aparine</i> | | | N | Cleavers |
| <i>Galium</i> | <i>parisiense</i> | | | I | Wall Bedstraw |
| SALICACEAE | | | | | WILLOW FAMILY |
| <i>Populus</i> | <i>fremontii</i> | | | N | Fremont's Cottonwood |
| <i>Salix</i> | <i>exigua</i> | | | N | Sandbar Willow |
| <i>Salix</i> | <i>gooddingii</i> | | | N | Black Willow |
| <i>Salix</i> | <i>lasiolepis</i> | | | N | Arroyo Willow |
| SAPINDACEAE | | | | | SOAPBERRY FAMILY |
| <i>Aesculus</i> | <i>californica</i> | | | N | California Buckeye |
| SAXIFRAGACEAE | | | | | SAXIFRAGE FAMILY |
| <i>Darmera</i> | <i>peltata</i> | | | N | Indian-rhubarb |
| SELAGINACEAE | | | | | SPIKEMOSS FAMILY |
| <i>Selaginella</i> | <i>hansenii</i> | | | N | Hansen's Spike-moss |
| SMILACACEAE | | | | | SMILAX FAMILY |
| <i>Smilacina</i> | <i>californica</i> | | | N | California Greenbrier |
| SOLANACEAE | | | | | NIGHTSHADE FAMILY |
| <i>Solanum</i> | <i>americanum</i> | | | N | American Black Nightshade |
| TECOPHILAECEAE | | | | | BRODIAEA FAMILY |
| <i>Odontostomum</i> | <i>hartwegii</i> | | | N | Hartweg's Odontostomum |
| THEMIDACEAE | | | | | BRODIAEA FAMILY |
| <i>Brodiaea</i> | <i>californica</i> | | | N | California Brodiaea |
| <i>Brodiaea</i> | <i>sp.</i> | | | N | Brodiaea |
| <i>Brodiaea</i> | <i>minor</i> | | | N | Purdy's Brodiaea |
| <i>Dichelostemma</i> | <i>capitatum</i> | | | N | Blue Dicks |
| <i>Dichelostemma</i> | <i>multiflorum</i> | | | N | Round-toothed Ookow |
| <i>Dichelostemma</i> | <i>volubile</i> | | | N | Twining Ookow |
| <i>Triteleia</i> | <i>brdgesii</i> | | | N | Bridge's Tritileia |
| <i>Triteleia</i> | <i>hyacinthina</i> | | | N | Wild Hyacinth |
| VITACEAE | | | | | GRAPE FAMILY |
| <i>Vitis</i> | <i>californica</i> | | | N | California Wild Grape |
| ZYGOPHYLLACEAE | | | | | CREOSOTE FAMILY |
| <i>Tribulus</i> | <i>terretris</i> | | | I | Puncture-vine |
| "N" Indicates Native | | | | | |
| "I" Indicates Non-Native | | | | | |