APPENDIX D-2

BIOLOGICAL RESOURCES RARE PLANT SURVEY AND MAPPING, WRA, 2018

Rare Plant Survey Report

Stonegate Subdivision Project CITY OF CHICO, BUTTE COUNTY, CALIFORNIA

Prepared For:

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WRA Project Number 26061



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EXECUTIVE SUMMARY

WRA, Inc. (WRA) conducted floristic, protocol-level rare plant surveys within the approximately 317-acre Study Area for the proposed Stonegate Subdivision Project in the City of Chico, California. The surveys were conducted to determine the presence or absence of rare plant species with potential to occur and to document all plant species and plant communities present in the Study Area.

Prior to the most recent field survey effort, WRA reviewed the California Native Plant Society (CNPS), the United States Fish and Wildlife Service (USFWS), and the California Natural Diversity Database (CNDDB) lists to determine which species have been documented in the vicinity of the Study Area. Based on a review of occurrence records including previous surveys and a comparison of species habitat requirements with Study Area conditions, it was determined that 12 rare plant species have the potential to occur within the Study Area.

Surveys were conducted by trained botanists familiar with California flora. The surveys were conducted by walking transects spaced at approximately 50-foot intervals across the entire Study Area and were floristic in nature (i.e., all plants observed were identified to the lowest level possible, often subspecies or variety). The entire site was traversed on April 23 and 24, 2016. Foothill Associates conducted surveys on February 15 and 23, March 3, 17, 18, and 30, April 30, and May 3, 2016 and March 28 and April 21, 2017. WRA conducted additional rare plant surveys on and March 26 and 27, 2018. These survey dates encompassed the peak bloom periods for the majority of species with potential to occur. An additional supplemental survey was conducted on July 12, 2016 in potentially suitable habitat for the remaining late-blooming species that may not have been identifiable during the April survey. Overall rainfall for the three-month period preceding the April surveys was normal.

In total, 177 plant species were identified in the Study Area. One <u>Two</u> state and federally listed plant species, Butte County meadowfoam (*Limnanthes floccosa* ssp. *californica*), was observed within the Study Area. Approximately 1,656 16,542 individuals of Butte County meadowfoam were observed during the April various surveys. Approximately 68 shield-bracted monkeyflower individuals were observed during surveys by Foothill Associates in March, April and July of 2016. No other rare plant species were identified in the Study Area.

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1.0 INTRODUCTION

The City of Chico, acting as lead agency, is reviewing the proposed Stonegate Subdivision/General Plan Amendment/Rezone Project (Project) which would subdivide an approximately 313-acre site into a combination of open space, public right-of-way, park, single-family residential standard lots, single-family residential half-acre lots, multi-family residential, and commercial uses. WRA, Inc. (WRA) conducted floristic, protocol-level rare plant surveys within the approximately 313-acre site of proposed for subdivision (Study Area) to inform California Environmental Quality Act (CEQA) analysis and resource agency permitting. Surveys were conducted on April 23 and April 24, 2016. The survey dates correspond to the peak bloom periods for the majority of the 12 rare plant species that were considered to have potential to occur in the Study Area. An additional supplemental survey was conducted on July 12 in potentially suitable habitat for the remaining late-blooming species that may not have been identifiable during the April survey. WRA conducted an additional survey on March 26 and 27, 2018.

1.1 Study Area Description

The Study Area (APNs: 002-190-041, 018-510-007, 018-510-008, and 018-510-009) is located in the City of Chico, Butte County, California. The Study Area consists of approximately 317 acres located east of State Highway 99 in the southeast region of the City of Chico. The Study Area is located in the northern portion of the Chico United States Geologic Survey (USGS) 7.5-minute quadrangle map (USGS 2016). It is bounded by East 20th Street to the north, old Potter Road to the east (now the Steve Harrison Memorial Bike Path, a Class-I paved bike path maintained by the City of Chico), Skyway Road to the south, and adjacent development to the west; it is bisected by Bruce Road, which follows a north/south alignment through the Study Area (Figure 1). The Study Area is composed of an approximate 313-acre main study area, and two potential parcel addendums, referred to as north (0.80 acre) and west (1.0 acre) addendum areas (Figure 1).

The Study Area is generally level open space, gradually sloping up to the northeast from elevations of 225 feet at its south border along the Skyway to 267 feet on the north border along E. 20th Street. The site was historically used as rangeland, although little grazing has taken place over the past 25 years. All site parcels are currently vacant and undeveloped with the exception of dirt and gravel access roads. The Butte Creek Diversion Channel runs in a north-south direction through the eastern portion of the site, about midway between Bruce Road and the Steve Harrison Memorial Bike Path.

The Study Area is located on the eastern edge of the city limits and is surrounded on three sides by urban development including single and multi-family residences to the north, single-family residences to the west, and commercial land to the south. To the east is privately owned rangeland and open space that slopes gently up in elevation to rolling foothill terrain. The adjacent land to the east is outside of the city limits, but within the City's sphere of influence.

1.1.1 Biological Communities

A total of nine biological communities occur in the Study Area; seven of these communities are protected under state and federal regulations and are therefore considered sensitive. Biological communities are described in detail below and are shown in Figure 2.



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Figure 2. Biological Communities in the Study Area

Chico Butte County, California



Map Prepared Date: 7/26/2017 Map Prepared By: mrochelle Base Source: Esri Streaming - NAIP 2014 Data Source(s): WRA, Rolls Anderson & Rolls

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Non-Sensitive Biological Communities

Developed land. Developed land occupies approximately 26.37 acres in the Study Area plus west addendum area and 26.00 in the Study Area plus north addendum. Developed land within the Study Area includes dirt and gravel access roads as well as a raised gravel berm and paved bike path. These areas are largely un-vegetated, although the dirt roads supported sparse cover of disturbance tolerant plant species such as purple sand spurry (*Spergularia rubra*), narrowleaf cottonrose (*Logfia gallica*), windmill pink (*Petrorhagia dubia*), shining pepper grass (*Lepidium nitidum*), coastal heron's bill (*Erodium cicutarium*), vinegarweed (*Trichostema lanceolatum*), and turkey-mullein (*Croton setiger*).

Annual grassland. Annual grassland comprises the vast majority of the Study Area (approximately 269.1 acres). Annual grasslands are known throughout California on all aspects and topographic positions and underlain by a variety of substrates. Annual grasslands are typically dominated by non-native and native annual grasses and forbs along with scattered native wildflowers. This community contains elements non-native grassland (element code 42200) as described by Holland (1986) and wild oats grassland (*Avena* spp. Semi-Natural Herbaceous Alliance as described by *A Manual of California Vegetation* (CNPS 2016a).

Plant species observed in annual grasslands in the Study Area include medusa head grass (*Elymus caput-medusae*), Italian ryegrass (*Festuca perennis*), oats (*Avena barbata* and *A. fatua*), ripgut brome (*Bromus diandrus*), soft chess (*B. hordeaceus*), foxtail barley (*Hordeum murinum*), yellow starthistle (*Centaurea solstitialis*), blow wives (*Achyrachaena mollis*), harvest brodiaea (*Brodiaea coronaria*), yellow mariposa (*Calochortus luteus*), soaproot (*Chlorogalum angustifolium*), purple clarkia (*Clarkia purpurea* ssp. *quadrivulnera*), field bindweed (*Convolvulus arvensis*), frying pans (*Eschscholzia lobbii*), wild geranium (*Geranium dissectum*), rose clover (*Trifolium hirtum*), narrow leaved onion (*Allium amplectens*), and hairy vetch (*Vicia villosa*), among many other grasses and forbs.

Grasslands in the Study Area occur on both low floodplain terraces adjacent to vernal swales and on high terraces characterized by Mima mound topography. Mima mounds are natural mounds forming a conspicuous hummock pattern across the landscape. Mima mounds are typically found in areas with shallow soils and are commonly associated with vernal pools in California (Keeler-Wolf *et al.* 1998). Soils are very thin throughout annual grasslands within the Study Area (approximately 2 to 10 inches) and are underlain by cemented, cobbly and gravelly alluvium derived from volcanic rocks.

Within the Study Area, mounds are typically dominated by a dense cover of non-native annual grasses while depressions between the mounds are more sparsely vegetated and support more native plant species, especially native forbs. As discussed in Section 4.3.1, most of the occurrences of the State and Federal listed Butte County meadowfoam (*Limnanthes floccosa* ssp. *californica*) were found within areas mapped as annual grassland and most plants were found either in microdepressions on the high terraces, or along the margins of ephemeral swales.

Sensitive Biological Communities

Perennial marsh comprises approximately 1.24 acres of the Study Area within the southeastern portion of the stream corridor (Foothill 2017). Perennial marshes can occur as the result of natural and/or artificial water flows associated with agricultural or residential water uses. Typically, depressional perennial marshes remain inundated or saturated throughout the year. The persistence of inundation/saturation throughout the year permits the growth of warm-season wetland grasses and perennial herbaceous plant species.

Within the Great Central Valley, depressional perennial marshes 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. The perennial marsh in the Study Area contains elements of coastal and valley freshwater marsh as described by Holland (1986) and cattail marsh (*Typha* spp. Herbaceous Alliance) as described by as described by *A Manual of California Vegetation* (CNPS 2016a). Perennial 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. Frequently, perennial marshes are situated in-channel, below the ordinary high water mark (OHWM), or on the fringe of the stream.

In the Study Area, the Corps verified delineation identifies a perennial marsh is located adjacent to the Butte Creek Diversion Channel in the southeastern portion of the site, near the mixed riparian woodland and seasonal wetlands. WRA identified perennial marsh habitat within the northern portion of the Butte Creek Diversion Channel. Due to perennial hydrology, marsh habitat is likely interspersed throughout the Butte Creek Diversion Channel. Dominant vegetation within the depressional perennial marsh includes: curly dock (*Rumex crispus*), Himalayan blackberry (*Rubus ameniacus*), narrow leaf cattail (*Typha angustifolia*), common rush (*Juncus effuses*), nutsedge (*Cyperus sp.*), and spikerush (*Eleocharis macrostachya*), and other freshwater emergent vegetation. All areas mapped as perennial marsh support a prevalence or dominance of hydrophytic vegetation, hydric soils, and wetland hydrology sufficient to meet the requirements as jurisdictional features under Section 404 of the CWA. These features are potentially subject to Corps and RWQCB jurisdiction as Waters of the U.S. and State. Perennial marsh is also potentially subject to Section 1602 of the California Fish and Game Code (CFGC).

The aquatic portions of perennial marsh often host a variety of invertebrate species as described for vernal pools below. Dependent upon the setting, marshes may also support fishes and breeding by common amphibians. Additionally, emergent wetland vegetation within marshes is typically used for foraging, shelter, and nesting by a variety of birds.

Vernal Pools. Vernal pools comprise approximately 3.68 acres of the project site and 0.15 acre of the west addendum area, for a total of 3.83 acres within 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. The vernal pools within the Study Area are northern hardpan vernal pools (element code: 44110) as described by Holland (1986) and Fremont's goldfields – Downingia vernal pools (Lasthenia fremontii – Downingia [bicornuta] Herbaceous Alliance) as described by A Manual of California Vegetation (CNPS 2016a). Northern hardpan vernal pools occur within depressions on cemented soils such as the Corning, Red Bluff, Redding, and San Joaquin soil series within and around the Great Central Valley. Vernal pool soils in the Study Area are typically very thin (approximately 1 to 3 inches) and are underlain by a hardpan of cemented, cobbly and gravelly alluvium derived from volcanic rocks. These vernal pools are characterized by a low, amphibious, herbaceous community dominated by annual herbs and grasses. Germination and growth begin with winter rains, often continuing when inundated. Rising spring temperatures evaporate the pools, leaving concentric bands of vegetation that colorfully encircle the drying pool (Holland 1986). This community is found primarily on older geomorphic surfaces and on volcanic substrates (CNPS 2016a). Vernal pool features within the Study Area occur in topographic depressions that vary in size, depth, and hydroperiod.

Plant species observed in vernal pools onsite include bristled downingia (*Downingia bicornuta* var. *bicornuta*), horned downingia (*D. ornatissima* var. *ornatissima*), spikerush, coyote thistle

(*Eryngium vaseyi*), vernal pool goldfields (*Lasthenia fremontii*), white headed navarretia (*Navarretia leucocephala* ssp. *leucocephala*), common vernal pool allocarya (*Plagiobothrys stipitatus* var. *micranthus*), woolly marbles (*Psilocarphus oregonus*), annual beard grass (*Polypogon monspeliensis*), and barley (*Hordeum marinum* ssp. *gussoneanum*). Hydrology sources include direct precipitation and sheet flow. All areas mapped as vernal pools contain a prevalence or dominance of hydrophytic vegetation, hydric soils, and wetland hydrology sufficient to meet the requirements as jurisdictional features under Section 404 of the Clean Water Act (CWA).

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 wildlife species were observed within vernal pools on the property during the site visits, although the pools were only visually examined and no protocollevel surveys were completed. Special-status wildlife with the potential to occur in the site's vernal pools include western spadefoot (for aquatic breeding) and vernal pool branchiopods (fairy and tadpole shrimps), some of which are listed under the Endangered Species Act.

Seasonal Wetlands within the Study Area

Depressional Seasonal Wetlands. Depressional seasonal wetlands comprise approximately 4.01 acres of the project site and 0.01 acre of the west addendum area for a total of 4.02 acres within the Study Area. Depressional seasonal wetlands exhibit a hydrologic regime dominated by saturation, rather than inundation. Depressional seasonal wetlands within the site occur as depressions within the topography with a hydrologic regime dominated by saturation and capable of supporting hydrophytic plant species and hydric soils. Dominant vegetation within the depressional seasonal wetlands includes: spikerush, Italian ryegrass, rattail sixweeks grass (*Festuca myuros*), rabbitfoot grass (*Polypogon monspeliensis*), and Mediterranean barley.

Riverine Seasonal Wetlands. Riverine seasonal wetlands or vernal swales comprise 24,247 linear feet or 4.74 acres of the Study Area. Riverine seasonal wetlands are defined by a hydrologic regime dominated by unidirectional flow of water. Riverine seasonal wetlands typically occur in topographic folds or swales and represent natural drainages that convey sufficient water to support wetland vegetation. Riverine seasonal wetlands typically convey water during and shortly after storm events.

Riverine seasonal wetlands occur in the Study Area as dendritic networks of generally narrow, roughly linear depressions that convey channelized flow during the wet season. These riverine seasonal 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.

Soils are very thin (approximately 0 to 5 inches) and are underlain by cemented, cobbly and gravelly alluvium derived from volcanic rocks. Hydrology sources include direct precipitation and runoff from the surrounding watershed. All areas mapped as riverine seasonal wetlands support a prevalence or dominance of hydrophytic vegetation, hydric soils, and wetland hydrology sufficient to meet the requirements as jurisdictional features under Section 404 of the Clean Water Act.

In terms of providing habitat for wildlife, riverine seasonal wetlands 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, riverine seasonal wetlands that are inundated for relatively long periods and/or hold larger water volumes may be occupied by western spadefoot and vernal pool branchiopods.

Other Aquatic Resources within the Study Area

Ephemeral Drainage. Approximately 1,164 linear feet of ephemeral drainage comprises approximately 0.30 acres of the Study Area. Ephemeral drainages are features that do not meet the three-parameter criteria for vegetation, hydrology and soils, but do convey water and exhibit an "ordinary high water mark." Ephemeral drainages are primarily fed by stormwater runoff. These features convey flows during and immediately after storm events but may stop flowing or begin to dry if the interval between storm events is long enough. Typically, these features exhibit a defined bed and bank and often show signs of scouring as a result of rapid flow events. Within ephemeral drainages, topographic depressions in the bed of the feature may exhibit vegetation patterns commonly associated with vernal pools or depressional seasonal wetlands. Often these features are lightly vegetated due to seasonal rapid-flow events resulting in a scoured channel, bed, and bank. Dominant vegetation identified by Foothill within the bed and along the banks of the ephemeral drainages include upland species including common vetch, filaree, slender oat, wild oat, medusa head, and soft chess.

Areas mapped as ephemeral drainage include an un-named tributary to the Butte Creek Diversion Channel in the northeastern portion of the Study Area. Ephemeral drainages in the Study Area flow over partially exposed bedrock with cobbles. Plant species observed within the ephemeral drainage include gumweed (*Grindelia camporum*), coyote thistle, and spikerush, Mediterranean barley, and Italian ryegrass, among other species. During the site visit by WRA, surface water was observed in isolated pools within the Butte Creek Diversion Channel. Areas mapped as ephemeral drainages are jurisdictional under Section 401 and 404 of the Clean Water Act and Section 1602 of the CFGC.

When they are inundated, ephemeral drainages typically host invertebrate populations and may also be used by fishes (if connected to perennial waters) and breeding amphibians. Wildlife species observed in ephemeral drainages in the Study Area include bullfrog and western toad. In the Study Area, ephemeral drainages are unlikely to support special-status wildlife species. **Intermittent Drainage.** Approximately 1,776 linear feet of intermittent drainage comprises approximately 0.48 acres of the Study Area. Intermittent drainages, as in ephemeral drainages, are features that do not meet the three-parameter criteria for vegetation, hydrology, and soils but do convey water and exhibit an "ordinary high water mark." Water flows within intermittent drainages are fed primarily by a seasonally perched groundwater table and supplemented by precipitation and stormwater runoff. After the initial onset of rains, these features have persistent flows throughout and past the end of the rainy season. Typically, these features exhibit a defined bed and bank and show signs of scouring as a result of rapid flow events. The bed of intermittent drainages consists of cobble often interrupted with bedrock. Water was present during the field delineations conducted by Foothill. Dominant vegetation observed along the banks of the intermittent drainages includes blue oak (*Quercus douglasii*), valley oak (*Quercus lobata*), American wild mint (*Mentha arvensis*), common rush, Italian ryegrass, wild oat, medusa head, and soft chess.

Areas mapped as intermittent drainage include an un-named tributary to the Butte Creek Diversion Channel, which runs generally in an east-west direction in the southeast portion of the Study Area. Plant species observed by WRA within the intermittent drainage include gumweed, coyote thistle, and spikerush, Mediterranean barley, and Italian ryegrass, among other species. A tributary in the southeast portion of the Study Area flows through a riparian oak woodland community (described below). The tributary was dry at the time of the site visit by WRA and encroached by Italian ryegrass. Areas mapped as intermittent drainage are jurisdictional under Section 401 and 404 of the Clean Water Act and Section 1602 of the CFGC.

When they are inundated, intermittent drainages typically host invertebrate populations and may also be used by fishes (if connected to perennial waters) and breeding amphibians. Wildlife species observed in intermittent drainages in the Study Area include bullfrog and western toad. In the project site, intermittent drainages are unlikely to support special-status wildlife species.

Approximately 6,212 linear feet of perennial drainage comprises Perennial Drainage. approximately 5.12 acres of the Study Area. Perennial drainages are features that may not meet the three-parameter criteria for vegetation, hydrology, and soils, but do convey water and exhibit an "ordinary high water mark." Perennial drainages generally convey unidirectional water flows throughout the entire year. Perennial drainages typically consists of a channel, bed, and bank and are devoid of vegetation due to the scouring effect of flowing water. Perennial drainages are often bordered by wetland vegetation communities of various composition and cover depending on flow rates, duration of flows, and soil types. Water was observed flowing during the Foothill wetland delineation. Dominant vegetation observed along the banks of the perennial drainage includes Italian ryegrass, arroyo willow (Salix lasiolepis), narrow leaf cattail, rabbitfoot grass, soft chess, and ripgut brome. Areas mapped as perennial drainage include the Butte Creek Diversion Channel, which runs generally in a north-south direction through the eastern portion of the site, and an un-named tributary, which runs generally in an east-west direction in the northeast portion of the Study Area. Perennial drainages in the Study Area flow over partially exposed bedrock with cobbles. Plant species observed within the Butte Creek Diversion Channel include gumweed, covote thistle, and spikerush. Mediterranean barley, and Italian ryegrass, among other species. Scattered trees and shrubs adjacent to the Butte Creek Diversion Channel are described in the mixed riparian woodland community below. During the site visit by WRA, surface water was observed in isolated pools within the Butte Creek Diversion Channel. Areas mapped as perennial drainage are jurisdictional under Section 401 and 404 of the Clean Water Act and Section 1602 of the CFGC.

When they are inundated, perennial drainages typically host invertebrate populations and may also be used by fishes (if connected to perennial waters) and breeding amphibians. Wildlife species observed in perennial drainages in the Study Area include bullfrog and western toad. In the Study Area, perennial drainages are unlikely to support special-status wildlife species.

Ditch/Canal. Approximately 2,332 linear feet of ditch/canal comprising approximately 0.39 acre 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 May site visits, ditches/canals were dry and supported sparse to dense cover of annual grasses such as barley and Italian ryegrass as well as some vernal pool species such as white headed navarretia and coyote thistle. Soils are thin and rocky with cobbles. The ditches/canals contained water at the time of the field delineations by Foothill. Dominant vegetation along the banks of the ditches/canals are comprised of upland vegetation including soft chess, ripgut brome, and medusa head. Ditch/canal features in the project site are potentially subject to Corps and RWQCB jurisdiction as Waters of the U.S. and State.

When they are inundated, ditches/canals may host invertebrate populations and be used by amphibians such as Sierran chorus frogs for breeding. Emergent wetland and other vegetation within ditches may provide foraging habitat and shelter for a variety of common wildlife species and nesting substrates for birds. No wildlife species were observed in the Study Area's ditches/canals during the WRA May site visits, and special-status wildlife are unlikely to occur there.

Excavated Pit. An excavated pit comprises approximately 0.07 acres of the Study Area. The pits were excavated to obtain information on soils within the Study Area. The excavated pits contained water at the time of the Foothill wetland delineations and lacked vegetation.

Riparian Oak Woodland. Riparian oak woodland comprises approximately 0.56 acre of the Study Area. Riparian oak woodland in the Study Area contains elements of valley oak woodland (element code: 71130) as described by Holland (1986) and valley oak woodland (*Quercus lobata* Woodland Alliance) as described by *A Manual of California Vegetation* (CNPS 2016a). Tree canopy in this community is intermittent and dominated by valley oak. Within the Study Area, this community is associated with an un-named tributary to the Butte Creek Diversion Channel, which runs in an east-west direction in the southeast region of the property. The tree canopy is dominated by valley oak with blue oak and interior live oak (*Q. wislizeni* var. *wislizeni*). Shrubs are largely absent and the herbaceous layer is grassy and dominated by oats and Italian ryegrass. Riparian oak woodland is considered a sensitive community under Section 1602 of the CFGC and may be regulated by the RWQCB and CDFW.

Riparian oak woodland generally features structurally-complex trees in close proximity to water or otherwise mesic soils, and thus provides high-quality habitat for a wide variety of wildlife including terrestrial invertebrates, mammals, many types of birds, and herpetofauna. Wildlife species observed in riparian oak woodland in the Study Area include acorn woodpecker (*Melanerpes formicivorus*), mourning dove (*Zenaida macroura*), northern mockingbird (*Mimus polyglottos*), and western scrub jay (*Aphelocoma californica*), all of which may nest there. Special-status birds that may also utilize riparian oak woodland in the Study Area for foraging and nesting include oak titmouse (*Baeolophus inornatus*), white-tailed kite, loggerhead shrike (*Lanius ludovicianus*), yellow-billed magpie (*Pica nuttalli*), and Nuttall's woodpecker (*Picoides nuttallii*); special-status mammals that may occupy this habitat include pallid bat (*Antrozous pallidus*). **Mixed Riparian Woodland.** Mixed riparian woodland comprises approximately 1.10 acres of the Study Area. This community is associated with the southern portion of the Butte Creek Diversion Channel. Scattered trees and shrubs include white alder (*Alnus rhombifolia*), California coffeeberry (*Frangula californica*), ash (*Fraxinus dipetala* and *F. latifolia*), cottonwood (*Populus fremontii* ssp. *fremontii*), Himalayan blackberry, blue elderberry (*Sambucus nigra* ssp. *caerulea*), poison oak (*Toxicodendron diversilobum*), and California wild grape (*Vitis californica*). The herbaceous layer is grassy and dominated by oats and Italian ryegrass. Mixed riparian woodland is considered a sensitive community under Section 1602 of the CFGC and may be regulated by the RWQCB and CDFW.

Mixed riparian woodland generally provides high-quality habitat for wildlife as described for riparian oak woodland above. However, vegetative structure is more diverse within this community, so both species diversity and utilization may be higher. Wildlife species observed in mixed riparian woodland in the Study Area include red-winged blackbird (*Agelaius phoeniceus*) and house finch (*Haemorhous mexicanus*). The special-status birds named above under oak riparian woodland have the potential to occur within the Study Area's mixed riparian woodland, as does the Federal listed valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*).

1.1.2 Soils

The Soil Survey of Butte Area, California, Parts of Butte and Plumas Counties (USDA 2006) indicates that the Study Area has five native soil types: Doemill-Jokerst complex, 3 to 8 percent slopes; Redtough-Redswale complex, 0 to 2 percent slopes; Redsluff gravelly loam, 0 to 2 percent slopes; Wafap-Hamslough complex, 0 to 2 percent slopes; and Clearhayes-Hamslough complex, 0 to 2 percent slopes. These soil types are described below and are shown in Figure 3.

Doemill-Jokerst Complex, 3 to 8 percent slopes. The soils in the Doemill-Jokerst complex are roughly 50 percent Doemill gravelly loam, 40 percent Jokerst very cobbly loam, and 10 percent minor components. Doemill gravelly loam soils occur as mounds on ridgetops and strath terraces on volcanic ridges. These soils are somewhat poorly drained with very high surface runoff. The available water holding capacity is very low (about 2.1 inches). Jokerst very cobbly loam soils occur in swales on ridgetops and strath terraces on volcanic ridges. These soils are poorly drained with very high surface runoff. The available water holding capacity is very low (about 2.1 inches). Both soil types formed from loamy residuum weathered from volcanic material. Neither soil type is a hydric soil.

Redtough-Redswale Complex, 0 to 2 percent slopes. The soils in the Redtough-Redswale complex are roughly 50 percent Redtough loam, 35 percent Redswale cobbly loam, and 15 percent minor components. Redtough loam occurs as mounds on high fan terraces. Redtough loam soils formed from loamy alluvium over cemented, cobbly and gravelly alluvium derived from volcanic rocks. These soils are somewhat poorly drained with very high surface runoff. The available water holding capacity is very low (about 1.6 inches). Redswale cobbly loam occurs in swales on high fan terraces. Redswale cobbly loam formed from cobbly and loamy alluvium over cemented, cobbly and gravelly alluvium derived from volcanic rocks. These soils are poorly drained with very high surface runoff. The available water holding capacity is very low (about 0.6 inches). Redswale cobbly loam formed from cobbly and loamy alluvium over cemented, cobbly and gravelly alluvium derived from volcanic rocks. These soils are poorly drained with very high surface runoff. The available water holding capacity is very low (about 0.7 inches). Redtough loam and Redswale cobbly loam are not hydric soils.

Redsluff gravelly loam, 0 to 2 percent slopes. Redsluff gravelly loam occurs on low fan terraces. These soils formed from fine-loamy alluvium derived from igneous, metamorphic, and sedimentary rocks over gravelly alluvium deposited from volcanic rocks. These soils are moderately well drained with negligible surface runoff. The available water holding capacity is moderate (about 5.5 inches). Redsluff gravelly loam is not a hydric soil.

Wafap-Hamslough Complex, 0 to 2 percent slopes. The soils in the Wafap-Hamslough complex are roughly 70 percent Wafap gravelly loam, 15 percent Hamslough clay, and 15 percent minor components. Wafap gravelly loam occurs on bars on low stream terraces. Wafap gravelly loam formed from gravelly and clayey alluvium over cobbly alluvium over cemented, cobbly and gravelly alluvium derived from volcanic rocks. These soils are somewhat poorly drained with very high surface runoff. Wafap gravelly loam is not a hydric soil. Available water holding capacity is low (about 2.7 inches). Hamslough clay occurs in channels on low stream terraces. Hamslough clay formed from clayey alluvium over clayey and gravelly alluvium over cemented, cobbly and gravelly alluvium derived from volcanic rocks. These soils are poorly drained with high surface runoff. The available water holding capacity is very low (about 2.3 inches). Hamslough clay is a hydric soil.

Clearhayes-Hamslough Complex, 0 to 2 percent slopes. The soils in the Clearhayes-Hamslough complex are roughly 70 percent Clearhayes sandy clay loam, 15 percent Hamslough clay, and 15 percent minor components. Clearhayes sandy clay loam occurs on bars on low strath terraces, and formed from fine-loamy alluvium derived from volcanic rocks over gravelly alluvium derived from andesite. The soils are somewhat poorly drained with high surface runoff. The available water holding capacity is low (about 3.0 inches). Clearhayes sandy clay is not a hydric soil. Hamslough clay occurs in channels on low strath terraces, and derived from clayey alluvium over gravelly alluvium derived from volcanic rocks. These soils are poorly drained with high surface runoff. The available water holding capacity is very low (about 2.3 inches). Hamslough clay is a hydric soil.



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1.2 Survey Information

Protocol-level rare plant surveys should be conducted in a manner that will locate any rare plants species that may be present. The California Native Plant Society's (CNPS; CNPS 2001) guidelines state that surveys should be conducted "at the proper time of year when rare, threatened, or endangered species are both evident and identifiable." Usually, this is when the plants are in bloom; however, there are species that are identifiable outside of the blooming period because non-floral structures (e.g., leaves, roots) are sufficient to make a species determination and/or floral structures (e.g., fruits, buds) are necessary to be in a state of maturity beyond or prior to the documented blooming period. When rare plants are known to occur in the type(s) of habitat present in the Study Area, nearby accessible occurrences of the plant (reference sites) should be observed to determine that the plants are identifiable at the time of the survey. In addition, the CDFG (2009) and the USFWS (1996) give detailed instructions pertaining to the adequacy of surveys and results. The following section provides details related to precipitation and other conditions that may affect the survey results and includes information about the results of previous surveys conducted in the Study Area.

1.2.1 Summary of Prior Botanical Surveys

Before the WRA survey conducted in April of 2016, the following rare plant surveys were conducted in the Study Area.

Foothill Associates (2016)

Foothill Associates' botanists previously conducted focused bloom season surveys for Butte County meadowfoam within the western portion of the Site on March 18 and March 26, 2004. Project botanists conducted additional focused bloom season surveys and comprehensive botanical inventories on March 17, 18, 23, 24, and 30, 2016; April 12, 13, and 14, 2016; and July 21, 2016.

California Natural Diversity Database Records

The CNDDB includes occurrences of Butte County meadowfoam within and immediately adjacent to the Study Area (CNDDB Occurrence #20; CDFW 2016). According to CNDDB records, this population has been surveyed on a semi-regular basis since 1984. The number of observed individuals of Butte County meadowfoam in the Study Area varied significantly from year to year. Less than 100 plants were observed in 1984. Approximately 9,000 plants were observed in 1988. Thousands of plants were observed in 1992. Approximately 950 plants were observed in 2002. Approximately 10,200 plants were observed in 2008. These occurrences are mapped as 31 polygons, of which 27 occur entirely or partially within the Study Area (Figure 4). No other rare plant species have been documented within the Study Area according to the CNDDB (CDFW 2016) and Calflora (Calflora 2016) databases.

1.2.2 Precipitation

The Chico University Farm weather station (CA1715) has been active since 1951 and is located within three miles of the Study Area (USDA 2016). According to a WETS analysis for the Chico University Farm weather station, the average annual precipitation at the Study Area is 26.23 inches, with the majority (21.12 inches) occurring during the typical wet season from November to March (USDA 2016). Overall rainfall was normal during the three month-period preceding the April 2016 rare plant survey (above normal in March, below normal in February, and normal in

January). A detailed WETS analysis for the 2015-2016 <u>2014-2015</u> water year is provided in Table 1. Table 1. WETS Analysis for 2015-2016 <u>2014-2015</u> Water Year Prior to the Survey Dates.

Month		WETS			2014-2015 Water Year			
wonth	Below	Average	Above	Precipitation	Above/Below	Percent of Average		
October	0.51	1.34	1.68	0.64	Normal	47.76%		
November	1.41	3.50	4.29	1.95	Normal	55.71%		
December	1.76	3.63	4.43	3.25	Normal	89.53%		
January	2.49	5.17	6.32	6.29	Normal	121.66%		
February	1.72	4.50	5.44	0.54	Below	12.00%		
March	2.08	4.32	5.28	6.98	Above	161.16%		
April	0.53	1.59	1.90	0.74	Normal	46.54%		
Total		24.05		20.39		84.78%		



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1.2.3 Conditions Affecting Results

The CDFW plant survey guidelines (CDFG 2009) state that "adverse conditions may prevent investigators from determining the presence of, or accurately identifying, some species in potential habitat of target species. Disease, drought, predation, or herbivory may preclude the presence or identification of target species in any given year." WRA did not observe any signs of disease, drought (see precipitation data in section 1.2.2), predation, or herbivory that would preclude the presence or identification of target species during the April 2016 survey.

The CDFW plant survey guidelines (CDFG 2009) also state that "the failure to locate a known rare plant occurrence during one field season does not constitute evidence that this plant occurrence no longer exists at this location, particularly if adverse conditions are present. For example, surveys over a number of years may be necessary if the species is an annual plant having a persistent, long-lived seed bank and is known not to germinate every year. To further substantiate negative findings for a known occurrence, a visit to a nearby reference site may ensure that the timing of the survey was appropriate." Previously reported occurrences of Butte County meadowfoam suggest that the population in the Study Area can be highly variable from year to year (CDFW 2016; Leidos 2015). As such, the USFWS recommends two years of surveys within a five-year period to determine presence/absence of Butte County meadowfoam.

As stated above, the CNPS guidelines (CNPS 2001) state that surveys should be conducted at a time of year when species are "both evident and identifiable." The survey was conducted during the published blooming period of the target species. However, while the survey was within the published blooming period for Butte County meadowfoam, individuals of this species observed in the Study Area had recently finished blooming and were in fruit at the time of the survey. Butte County meadowfoam was still identifiable via fruiting characteristics, but was less conspicuous in this state than it would have been at peak bloom.

1.2.4 Surveyor Qualifications

Individuals who conducted the surveys have formal training in botany and extensive experience working in California. The surveys were conducted under the direction of two team leaders, both with extensive training in botany and vegetation ecology and both with previous protocol-level rare plant survey experience. The qualifications of the team leaders are summarized below.

<u>Chris Gurney, MS, Senior Associate Plant Biologist</u>. Chris received a Master of Science degree in Rangeland Management from the University of California, Berkeley and has taken technical courses with the CNPS and the California Native Grasslands Association. He holds an active plant voucher collecting permit (Permit No. 2081(a)-14-007-V) from the CDFW and serves as a CNPS Rare Plant Status Reviewer for the Central West and Great Valley regions. He has helped lead several large rare plant surveys in the San Francisco Bay, Inner South Coast Ranges, and San Joaquin Valley subregions of the California Floristic Province including surveys of more than 15,000 acres in eastern Monterey and San Luis Obispo counties.

<u>Rhiannon Korhummel, BS, Plant Biologist</u>. Rhiannon received a Bachelor of Science degree in Botany from Humboldt State University. She has extensive field-based experience in northern and central California conducting floristic surveys and vegetation plot data. Prior to joining WRA, Rhiannon worked for the California State Parks' Mendocino District and served as a biology lab technician for the College of the Redwoods in Fort Bragg. At WRA, Rhiannon's work includes protocol level rare plant monitoring, vernal pool vegetation and hydrology monitoring, vegetation type mapping, and wetland delineation.

2.0 METHODS

2.1 Background Data

Rare plants are defined here to include: (1) all plants that are federal- or state-listed as rare, threatened or endangered, (2) all federal and state candidates for listing, (3) all plants included in Ranks 1 through 4 of the CNPS Inventory of Rare, Threated, and Endangered Plants of California (Inventory; CNPS 2016b), and (4) plants that qualify under the definition of "rare" in the California Environmental Quality Act (CEQA), section 15380.

As stated in section 1.2.1, one federal- and state-endangered species, Butte County meadowfoam, has been documented to occur within the Study Area. A background information search was conducted to identify any other potential rare plant species that may occur in the Study Area vicinity. A table of these species, and their protection status, habitat requirements, and likelihood to occur in the Study Area is provided in Appendix A. Database searches were conducted for known occurrences of rare species in the Chico USGS 7.5-minute Quadrangle map (USGS 2016a) and the eight surrounding quadrangles. Sources included:

- California Natural Diversity Database (CDFW 2016)
- CNPS Inventory (CNPS 2016b)
- USFWS Quadrangle Search (USFWS 2016)
- Consortium of California Herbaria (CCH 2016)

All rare plant species documented within the vicinity of the Study Area were then assessed based on associated vegetation communities, soil affinity, associated species, topographic position, shade tolerance, disturbance tolerance, elevation, and population distribution to determine the potential for these species to occur in the Study Area (Appendix A).

2.2 Field Survey

2.2.1 Rare Plant Surveys

The surveys were conducted by walking transects spaced at approximately 50-foot intervals across the entire Study Area and were floristic in nature (i.e. all plants observed were identified to the lowest level possible, often subspecies or variety). The entire site was traversed on April 23 and 24, 2016. These survey dates encompassed the peak bloom periods for the majority of species with potential to occur. An additional supplemental survey was conducted on July 12, 2016 in potentially suitable habitat for the remaining late-blooming species that may not have been identifiable during the April survey. WRA conducted additional rare plant surveys on and March 26 and 27, 2018. Visits to reference populations of most target rare plant species were not feasible as nearby reported occurrences of special-status species with potential to occur in the Study Area were located on private property and inaccessible. Bidwell Park is the nearest large public open space area, but the park lacks vernal pool and vernal swale habitats similar to those observed in the Study Area.

The surveys followed the protocol for plant surveys described in recommended resource agency guidelines (CNPS 2001, CDFG 2000, CDFG 2009, USFWS 1996). All plants were identified using *The Jepson Manual*, 2nd Edition (Baldwin et al. 2012) and subsequent revisions by the Jepson Flora Project (2016), to the taxonomic level necessary to determine whether or not they were rare. Names given follow the Jepson Flora Project (2016). Natural communities were identified and assessed for rarity following *A Manual of California Vegetation*, Online Edition (CNPS 2016a),

and the California Fish and Game Code (CFGC). Plant surveys were floristic in nature with all observed species recorded and included on a species list provided in Appendix B. All rare plant populations and sensitive natural community locations were mapped using handheld Global Positioning System equipment.

3.0 RESULTS

3.1 Background Data Search Results

Based upon a review of the CNDDB (CDFW 2016), CNPS Electronic Inventory (CNPS 2016b), USFWS Species List (USFWS 2016), and CCH (2016) databases, 40 rare plant species have been documented in the vicinity of the Study Area; those recorded within a 5-mile radius of the Study Area and included in the CNDDB (CDFW 2016) are illustrated in Figure 4. Twelve species were determined to have a moderate or high potential to occur in the Study Area or have previously been documented in the Study Area, and are described in detail below. A table of all 40 rare plant species, including each species habitat requirements, blooming period, elevation range, and status, is provided in Appendix A.

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 vernally 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. The nearest documented occurrence is from 1938 in former rocky pastureland, approximately 3.5 miles northwest of the Study Area (CCH 2016). The most recent documented occurrence in Butte County is from 2012 in Upper Bidwell Park, approximately 4 miles northeast of the Study Area (CCH 2016). Depauperate milk-vetch was considered to have a moderate potential to occur in vernally 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.

Hoover's spurge (Euphorbia hooveri). Federal-threatened, Rank 1B.2. Moderate Potential. 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. There are two reported occurrences of this species in the vicinity of the Study Area (CDFW 2016). One occurrence is from 1986 and is located approximately 7 miles southeast of the Study Area (CDFW 2016). The other occurrence is from 2011 and is located approximately 12 miles northwest of the Study Area (CDFW 2016). Hoover's spurge was considered to have a moderate potential to occur in vernal pools in the Study Area. However, this species was not observed during the April or July 2016 surveys.

Woolly rose-mallow (*Hibiscus lasiocarpos* var. *occidentalis*). Rank 1B.2. Moderate **Potential.** Woolly rose-mallow is a perennial herb in the Malvaceae family that blooms from June

to September. This species is found in freshwater marshes and swamps, often in riprap on the side of levees, from sea level to 390 feet (CNPS 2016b). Observed associated species include valley oak (*Quercus lobata*), red buckthorn (*Frangula rubra*), California wild rose (*Rosa californica*), pennyroyal (*Mentha pulegium*), poison oak (*Toxicodendron diversilobum*), California mugwort (*Artemisia douglasiana*), California grape (*Vitis californica*), Curly dock (*Rumex crispus*), rough cocklebur (*Xanthium strumarium*), willow (*Salix* sp.), and blackberry (*Rubus* sp.).

This species is known from 37 USGS 7.5-minute quadrangles in Butte, Contra Costa, Colusa, Glenn, Sacramento, San Joaquin, Solano, Sutter, and Yolo counties. There are 15 reported occurrences of this species in the vicinity of the Study Area (CDFW 2016). The nearest and most recent documented occurrence is from 2002, over 4 miles northeast of the Study Area in Upper Bidwell Park (CDFW 2016). Woolly rose mallow was considered to have a moderate potential to occur along the banks of the intermittent stream channel that flows through the Study Area. However, this species was not observed during the April or July 2016 surveys.

Red Bluff dwarf rush (*Juncus leiospermus var. leiospermus***). Rank 1B.1. Moderate Potential.** Red Bluff dwarf rush is an annual herb in the Juncus family that blooms from March to June. This species is found in vernal pools and vernally mesic areas in chaparral, cismontane woodland, meadows and seeps, and valley and foothill grassland communities, at elevations ranging from approximately 110 to 4,100 feet (CNPS 2016b). Observed associated species include Oregon woolly marbles (*Psilocarphus oregonus***)**, white meadowfoam (*Limnanthes alba***)**, micropus (*Micropus californicus***)**, leafybract dwarf rush (*Juncus capitatus***)**, toad rush (*J. bufonius***)**, Great valley eryngo (*Eryngium castrense***)**, Sacramento mint (*Pogogyne zizyphoroides***)**, and Italian ryegrass (*Festuca perennis***)**.

This species is known from 28 USGS 7.5-minute quadrangles in Butte, Placer, Shasta, and Tehama counties. There are two reported occurrences of this species in the vicinity of the Study Area (CDFW 2016). One occurrence is from 1980 and is located approximately 10 miles north of the Study Area. The other occurrence is from 2002 and is located approximately 12 miles southeast of the Study Area. Red bluff dwarf rush was considered to have a moderate potential to occur in vernal pools and vernally mesic grassland within the Study Area. However, this species was not observed during the April or July 2016 surveys.

Butte County meadowfoam (*Limnanthes floccosa* ssp. *californica*). Federal Endangered, State Endangered, Rank 1B.1. Present. 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 vernally 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 (*Lepidium nitidum*), vernal pool goldfields (*Lasthenia fremontii*), big heron bill (*Erodium botrys*), common stickyseed (*Blennosperma nanum*), stalked popcorn flower, Fremont's tidy tips (*Layia fremontii*), butter 'n' eggs (*Triphysaria eriantha*), white headed navarretia, soft blow wives (*Achyrachaena mollis*), common meadowfoam (*L. floccosa* ssp. *floccosa*), Sacramento mint, Great valley eryngo, California goldfields (*Lasthenia californica* ssp. *californica*), pacific foxtail (*Alopecurus saccatus*), stalked popcorn flower, Italian ryegrass, and barley.

This species is known from six USGS 7.5-minute quadrangles in Butte county CNPS (2016b). This species was documented in vernally mesic areas in the Study Area during the April 2016 survey and has previously been documented in the Study Area (CDFW 2016).

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 vernally 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 2016). The nearest and most recent documented occurrence is from 1991 and is located approximately 4 miles north of the Study Area. Woolly meadowfoam was considered to have a high potential to occur in vernal pools and vernally mesic grassland in the Study Area. However, this species was not observed during the April or July 2016 surveys.

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 in 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. The nearest documented occurrence is from 1988, within a quarter of a mile of the Study Area on the north side of E. 20th Street in an area that has since been developed (CCH 2016). The most recent occurrence in Butte County is from 2011, approximately 17 miles northwest of the Study Area (CCH 2016). Tehama navarretia was considered to have a high potential to occur in vernal pools and vernally mesic grasslands in the Study Area. However, this species was not observed during the April or July 2016 surveys.

Hairy Orcutt grass (*Orcuttia pilosa*). Federal Endangered, State Endangered, Rank 1B.1. Moderate 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. There are five documented occurrences of this species in the vicinity of the Study Area (CDFW 2016). The nearest and most recent documented occurrence was observed at the Vina Plains Preserve, approximately 16 miles northwest of the Study Area in 2011 (CDFW 2016). Hairy orcutt grass was considered to have a moderate potential to occur in vernal pools in the Study Area. However, this species was not observed during the April or July 2016 surveys.

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 navarretia, white brodiaea (*Triteleia hyacinthina*), and annual hairgrass.

This species is known from 21 USGS 7.5-minute quadrangles in Butte, Shasta, and Tehama counties. There are three documented occurrences of this species in the vicinity of the Study Area (CDFW 2016). The nearest documented occurrence is from 1986 and is located approximately 4 miles northwest of the Study Area (CDFW 2016). The most recent documented occurrence is over 15 miles southeast of the Study Area (CDFW 2016). Ahart's paronychia was considered to have a high potential to occur in vernal pools and vernally mesic grasslands in the Study Area. However, this species was not observed during the April or July 2016 surveys.

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. The nearest documented occurrence is from 2005, within approximately one quarter mile of the Study Area to the north (CNPS 2016b). The most recent occurrence in Butte County is from 2010, approximately 5 miles northeast of the Study Area (CCH 2016). Bidwell's knotweed was considered to have a high potential to occur in grasslands in the Study Area. However, this species was not observed during the April or July 2016 surveys.

California beaked-rush (*Rhynchospora californica***).** Rank 1B.1. Moderate Potential. California beaked rush is a perennial herb in the Cyperaceae family that blooms from May to July. This species is found bogs and fens, lower montane coniferous forest, meadows and seeps, and freshwater marshes and swamps, at elevations from approximately 150 to 3,310 feet (CNPS 2016b). Observed associated species include deergrass (*Muhlenbergia rigens***)**, dense sedge (*Carex densa*), spike rush (*Eleocharis* sp.), shortspike hedgenettle (*Stachys pycnantha*), arroyo willow (*Salix lasiolepis*), creeping St. John's wort (*Hypericum anagalloides*), little quaking grass (*Briza minor*), and Italian ryegrass.

This species is known from 8 USGS 7.5-minute quadrangles in Butte, Marin, Napa, and Sonoma counties. There are four reported occurrences of this species in the vicinity of the Study Area (CDFW 2016). The nearest and most recent documented occurrence is from 2002 and is located approximately 4 miles northeast of the Study Area (CDFW 2016). California beaked-rush was considered to have a moderate potential to occur in or around the large vernal pool habitat in the southeast portion of the Study Area. However, this species was not observed during the April or July 2016 surveys.

Brownish beaked-rush (*Rhynchospora capitellata***).** Rank 2B.2. Moderate Potential. Brownish beaked rush is a perennial herb in the Cyperaceae family that blooms from July to August. This species is found in mesic areas of lower montane coniferous forest, meadows and seeps, marshes and swamps, upper montane coniferous forest communities, at elevations from approximately 150 to 6,560 feet (CNPS 2016b). Observed associated species include spikerushes (*Eleocharis* spp.), rushes (*Juncus* spp.), bulrushes (*Scirpus* spp.), sedges (*Carex* spp.), and California pitcherplant (*Darlingtonia californica*).

This species is known from 18 USGS 7.5-minute quadrangles in nine counties. There is one reported occurrence of this species in the vicinity of the Study Area (CDFW 2016). The occurrence is from 1988 and is located approximately eight miles east of the Study Area (CDFW 2016). Brownish beaked-rush was considered to have a moderate potential to occur in or around the large vernal pool habitat in the southeast portion of the Study Area. However, this species was not observed during the April or July 2016 surveys.

3.2 Field Survey Results

3.2.1 Rare Plant Species

During surveys by WRA and Foothill Associates, two rare plant species were observed in the Study Area: Butte County meadowfoam and shield-bracted monkeyflower (*Mimulus glaucescens*). An estimated 16,542 individuals of Butte County meadowfoam and 68 shield-bracted monkeyflower were observed in the Study Area over several surveys by WRA and Foothill Associates. Populations of Butte County meadowfoam in the Study Area were generally observed within microdepressions and slight swales within vernally mesic grassland. Shield-bracted monkeyflower individuals were mapped along the banks of the perennial drainage. Observed species associated with Butte County meadowfoam in the Study Area include narrow leaved onion, barley, medusahead, Italian ryegrass, narrow boisduvalia (*Epilobium torreyi*), low Brodiaea (*Brodiaea minor*), California plantain, Sierra mock stonecrop (*Sedella pumila*), Padre's shooting star (*Primula clevelandii*), vernal pool goldfields, and rose clover. Potential threats include encroachment by invasive species, trampling, and development. Photographs of this species were taken during the survey and are included in Appendix C. Locations of both species are shown in Figure 5.

4.0 CONCLUSIONS

Based on a review of literature and site assessments, the Study Area is potentially suitable for 13 rare plant species. Protocol-level surveys were conducted in April of 2016 (WRA) and March, April, and July of 2016 (Foothill) during the peak bloom periods for the majority of the thirteen plant species with potential to occur in the Study Area. The entire site was traversed on April 23 and 24, 2016 . Foothill Associates conducted surveys on February 15 and 23, March 3, 17, 18, and 30, April 30, and May 3, 2016 and March 28 and April 21, 2017. WRA conducted additional rare plant surveys on and March 26 and 27, 2018. An additional supplemental survey was conducted on July 12, 2016 in potentially suitable habitat for the remaining late-blooming species that may not have been identifiable during the April survey. A total of 177 plant species were observed by WRA in the Study Area during the 2016 survey, including populations of one rare species: an estimated 1,656 16,542 individuals of Butte County meadowfoam. Approximately 67 68 shield-bracted monkeyflower individuals were observed during surveys by Foothill Associates in March, April and July of 2016. The remaining 11 species are considered absent from the Study Area. In addition to Butte County meadowfoam, seven sensitive natural communities were observed: vernal pools, vernal swales, freshwater marsh, intermittent stream, drainage ditch, riparian oak woodland, and mixed riparian woodland.

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Figure 5. BCM Map/Rare Plant Survey

Chico Butte County, California

1,000 0 250 500 Feet

Map Prepared Date: 4/6/2018 Map Prepared By: smortensen Base Source: Esri Streaming - NAIP 2014 Data Source(s): WRA, Rolls Anderson & Rolls, Foothill

Path: L:\Acad 2000 Files\26000\26061\GIS\ArcMap\CEQA\2018\Rare Plants Impacts 20180406.mxd





Figure 5. Rare Plant Survey Results

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[USGS] United States Geological Survey. 2016. Chico 7.5-minute quadrangle map.

APPENDIX A.

POTENTIAL FOR RARE PLANT SPECIES TO OCCUR IN THE STUDY AREA This page intentionally blank.

Appendix A. Potential for special-status plant species to occur in the Study Area. List compiled from the California Department of Fish and Wildlife (CDFW) Natural Diversity Database (CDFW 2016), U.S. Fish and Wildlife Service (USFWS) Species Lists, and California Native Plant Society (CNPS) Electronic Inventory search of the Chico, Nord, Richardson Springs, Paradise West, Hamlin Canyon, Shippee, Nelson, Llano Seco, and Ord Ferry USGS 7.5' quadrangles.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	CONCLUSIONS/ RECOMMENDATIONS
Plants				
depauperate milk-vetch Astragalus pauperculus	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.	Moderate Potential. The Study Area supports suitable vernally mesic grassland with stony, volcanically-derived soils.	Not Present. This species was not observed during protocol-level, floristic rare plant surveys. No further actions are recommended for this species.
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.	Unlikely. This species is typically associated with lower elevation subalkaline flats with dry, adobe soil. The Study Area lacks suitable dry adobe soils and is on the upper edge of the documented elevation range for this species.	Not Present. This species was not observed during protocol-level, floristic rare plant surveys. No further actions are recommended for this species.
Mexican mosquito fern <i>Azolla microphylla</i>	Rank 4.2	Marshes and swamps (ponds, slow water). Elevation ranges from 100 to 330 feet (30 to 100 meters). Blooms August.	Unlikely. There are no ponds in the Study Area and none of the seasonal wetlands have a sufficient hydroperiod to support this species.	Not Present. This species was not observed during protocol-level, floristic rare plant surveys. Although the bloom period is listed as August in the CNPS Inventory, CCH lists collections from every month of the year (CCH 2016). Therefore, we believe the April survey timing was

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	CONCLUSIONS/ RECOMMENDATIONS
				suitable to detect this species. No further actions are recommended for this species.
big-scale balsamroot Balsamorhiza macrolepis	Rank 1B.2	Chaparral, cismontane woodland, valley and foothill grassland/sometimes serpentine. Elevation ranges from 300 to 5100 feet (90 to 1555 meters). Blooms March to June.	Unlikely. The Study Area is slightly below the documented elevation range for this species and lacks serpentine soils.	Not Present. This species was not observed during protocol-level, floristic rare plant surveys. No further actions are recommended for this species.
watershield Brasenia schreberi	Rank 2B.3	Marshes and swamps/freshwater. Elevation ranges from 100 to 7220 feet (30 to 2200 meters). Blooms June to September.	Unlikely. There are no ponds in the Study Area and none of the seasonal wetlands have a sufficient hydroperiod to support this species.	Not Present. This species was not observed during protocol-level, floristic rare plant surveys. Although the survey was conducted outside of the listed bloom period, this species would have been vegetatively identifiable to genus level at the time of the survey. No further actions are recommended for this species.
brassy bryum Bryum chryseum	Rank 4.3	Chaparral (openings), cismontane woodland, valley and foothill grassland. Elevation ranges from 160 to 1970 feet (50 to 600 meters).	Unlikely. The Study Area is on the low end of the documented elevation range for this species.	Not Present. This species was not observed during protocol-level, floristic rare plant surveys. No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	CONCLUSIONS/ RECOMMENDATIONS
round-leaved filaree California macrophylla	Rank 1B.2	Cismontane woodland, valley and foothill grassland/clay. Elevation ranges from 50 to 3940 feet (15 to 1200 meters). Blooms March to May.	Unlikely. The Study Area lacks suitable clay soils.	Not Present. This species was not observed during protocol-level, floristic rare plant surveys. No further actions are recommended for this species.
Butte County calycadenia <i>Calycadenia oppositifolia</i>	Rank 4.2	Chaparral, cismontane woodland, lower montane coniferous forest, meadows and seeps, valley and foothill grassland/openings; volcanic, granitic or serpentine. Elevation ranges from 300 to 3100 feet (90 to 945 meters). Blooms April to July.	Unlikely. This species is typically associated with dry stoney plains and rock outcrops. The grassland in the Study Area is vernally mesic and is slightly below the documented elevation range for this species.	Not Present. This species was not observed during protocol-level, floristic rare plant surveys. No further actions are recommended for this species.
Butte County morning-glory Calystegia atriplicifolia ssp. buttensis	Rank 4.2	Chaparral, lower montane coniferous forest/rocky, sometimes roadside. Elevation ranges from 1850 to 5000 feet (565 to 1524 meters). Blooms May to July.	No Potential. The Study Area lacks suitable chaparral or forest habitat and is well below the elevation range for this species.	Not Present. This species was not observed during protocol-level, floristic rare plant surveys. No further actions are recommended for this species.
flagella-like atractylocarpus Campylopodiella stenocarpa	Rank 2B.2	Cismontane woodland. Elevation ranges from 330 to 1640 feet (100 to 500 meters).	Unlikely. The Study Area lacks suitable woodland habitat and is slight below the elevation range for this species.	Not Present. This species was not observed during protocol-level, floristic rare plant surveys. No further actions are recommended for this species.
dissected-leaved toothwort Cardamine pachystigma var. dissectifolia	Rank 1B.2	Chaparral, lower montane coniferous forest/usually serpentine, rocky. Elevation ranges from 840 to 6890 feet (255 to 2100 meters). Blooms February to May.	No Potential. The Study Area lacks suitable chaparral or forest habitat and is well below the elevation range for this species.	Not Present. This species was not observed during protocol-level, floristic rare plant surveys. No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	CONCLUSIONS/ RECOMMENDATIONS
pink creamsacs Castilleja rubicundula var. rubicundula	Rank 1B.2	Chaparral (openings), cismontane woodland, meadows and seeps, valley and foothill grassland/serpentine. Elevation ranges from 70 to 2990 feet (20 to 910 meters). Blooms April to June.	No Potential. This species is a strict serpentine endemic and the Study Area lacks serpentine soils.	Not Present. This species was not observed during protocol-level, floristic rare plant surveys. No further actions are recommended for this species.
Parry's rough tarplant Centromadia parryi ssp. rudis	Rank 4.2	Valley and foothill grassland, vernal pools/alkaline, vernally mesic, seeps, sometimes roadsides. Elevation ranges from 0 to 330 feet (0 to 100 meters). Blooms May to October.	Unlikely. The Study Area lacks suitable alkaline clay soils.	Not Present. This species was not observed during protocol-level, floristic rare plant surveys. Although the surveys were conducted prior to the bloom period this species would have been vegetatively identifiable to genus level at the time of the survey and only <i>C. fitchii</i> was observed. No further actions are recommended for this species.
white-stemmed clarkia Clarkia gracilis ssp. albicaulis	Rank 1B.2	Chaparral, cismontane woodland/sometimes serpentine. Elevation ranges from 800 to 3560 feet (245 to 1085 meters). Blooms May to July.	No Potential. The Study Area lacks suitable chaparral or woodland habitat and is well below the elevation range for this species.	Not Present. This species was not observed during protocol-level, floristic rare plant surveys. No further actions are recommended for this species.
marsh claytonia <i>Claytonia palustris</i>	Rank 4.3	Meadows and seeps (mesic), marshes and swamps, upper montane coniferous forest. Elevation ranges from 3280 to 8200 feet (1000 to 2500 meters). Blooms May to October.	No Potential. The Study Area is well below the elevation range for this species.	Not Present. This species was not observed during protocol-level, floristic rare plant surveys. No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	CONCLUSIONS/ RECOMMENDATIONS
recurved larkspur <i>Delphinium recurvatum</i>	Rank 1B.2	Chenopod scrub, cismontane woodland, valley and foothill grassland/alkaline. Elevation ranges from 10 to 2590 feet (3 to 790 meters). Blooms March to June.	Unlikely. The Study Area lacks suitable fine alkaline soils.	Not Present. This species was not observed during protocol-level, floristic rare plant surveys. No further actions are recommended for this species.
Hoover's spurge Euphorbia hooveri	FT, Rank 1B.2	Vernal pools. Elevation ranges from 80 to 820 feet (25 to 250 meters). Blooms July to September (occasionally October).	Moderate Potential. Vernal pools in the Study Area could provide suitable habitat for this species.	Not Present. This species was not observed during protocol-level, floristic rare plant surveys. No further actions are recommended for this species.
Butte County fritillary <i>Fritillaria eastwoodiae</i>	Rank 3.2	Chaparral, cismontane woodland, lower montane coniferous forest (openings)/sometimes serpentine. Elevation ranges from 160 to 4920 feet (50 to 1500 meters). Blooms March to June.	Unlikely. The Study Area lacks suitable forest, woodland, or chaparral habitat.	Not Present. This species was not observed during protocol-level, floristic rare plant surveys. No further actions are recommended for this species.
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.	Unlikely. The Study Area lacks suitable clay soils.	Not Present. This species was not observed during protocol-level, floristic rare plant surveys. No further actions are recommended for this species.
hogwallow starfish <i>Hesperevax 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.	Unlikely. The Study Area lacks suitable clay soils.	Not Present. This species was not observed during protocol-level, floristic rare plant surveys. No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	CONCLUSIONS/ RECOMMENDATIONS
woolly rose-mallow <i>Hibiscus lasiocarpos var. occidentalis</i>	Rank 1B.2	Marshes and swamps (freshwater)/often in riprap on sides of levees. Elevation ranges from 0 to 390 feet (0 to 120 meters). Blooms June to September.	Moderate Potential. The banks of the stream channel that flows through the Study Area could provide suitable habitat for this species.	Not Present. This species was not observed during protocol-level, floristic rare plant surveys. Although the survey was conducted outside of the listed bloom period, this species would have been vegetatively identifiable to genus level at the time of the survey. No further actions are recommended for this species.
California satintail Imperata brevifolia	Rank 2B.1	Chaparral, coastal scrub, Mojavean desert scrub, meadows and seeps (often alkali), riparian scrub/mesic. Elevation ranges from 0 to 3990 feet (0 to 1215 meters). Blooms September to May.	Unlikely. The Study Area lacks suitable chaparral or scrub habitats with alkaline soils.	Not Present. This species was not observed during protocol-level, floristic rare plant surveys. No further actions are recommended for this species.
Red Bluff dwarf rush <i>Juncus leiospermus var. leiospermus</i>	Rank 1B.1	Chaparral, cismontane woodland, meadows and seeps, valley and foothill grassland, vernal pools/vernally mesic. Elevation ranges from 110 to 4100 feet (35 to 1250 meters). Blooms March to June.	Moderate Potential. Vernal pools and vernally mesic grassland in the Study Area could provide suitable habitat for this species.	Not Present. This species was not observed during protocol-level, floristic rare plant surveys. No further actions are recommended for this species.
Humboldt lily Lilium humboldtii ssp. humboldtii	Rank 4.2	Chaparral, cismontane woodland, lower montane coniferous forest/openings. Elevation ranges from 300 to 4200 feet (90 to 1280 meters). Blooms May to July.	No Potential. The Study Area lacks suitable chaparral, forest, or woodland habitat.	Not Present. This species was not observed during protocol-level, floristic rare plant surveys. No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	CONCLUSIONS/ RECOMMENDATIONS
Butte County meadowfoam Limnanthes floccosa ssp. californica	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.	Present. This species has been previously documented in the Study Area (CDFW 2016).	Present. This species was observed in the Project Area.
woolly meadowfoam <i>Limnanthes floccosa 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).	High Potential. Vernal pools and vernally mesic grassland in the Study Area provide ideal habitat for this species and it has been previously documented within four miles of the Study Area on the same soil series (CDFW 2016).	Not Present. This species was not observed during protocol-level, floristic rare plant surveys. No further actions are recommended for this species.
shield-bracted monkeyflower <i>Mimulus glaucescens</i>	Rank 4.3	Chaparral, cismontane woodland, lower montane coniferous forest, valley and foothill grassland/serpentine seeps, sometimes streambanks. Elevation ranges from 200 to 4070 feet (60 to 1240 meters). Blooms February to August (occasionally September).	Unlikely. This species is a broad serpentine endemic associated with serpentine seeps, and the Study Area lacks serpentine soils.	Not Present. This species was not observed during protocol-level, floristic rare plant surveys. No further actions are recommended for this species.
veiny monardella <i>Monardella venosa</i>	Rank 1B.1	Cismontane woodland, valley and foothill grassland/heavy clay. Elevation ranges from 200 to 1350 feet (60 to 410 meters). Blooms May to July.	Unlikely. The Study Area lacks suitable heavy clay soils.	Not Present. This species was not observed during protocol-level, floristic rare plant surveys. Although the survey was conducted outside of the listed bloom period, this species would have been vegetatively identifiable to genus level at the time of the survey. No

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	CONCLUSIONS/ RECOMMENDATIONS
				further actions are recommended for this species.
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.	High Potential. Vernal pools and vernally mesic grassland in the Study Area provide ideal habitat for this species and it has been previously documented within 1/4 mile of the Study Area on the same soil series in 1988 (CCH 2016).	Not Present. This species was not observed during protocol-level, floristic rare plant surveys. No further actions are recommended for this species.
adobe navarretia Navarretia nigelliformis ssp. nigelliformis	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.	Unlikely. The Study Area lacks suitable clay soils.	Not Present. This species was not observed during protocol-level, floristic rare plant surveys. No further actions are recommended for this species.
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.	Moderate Potential. Vernal pools in the Study Area could provide suitable habitat for this species.	Not Present. This species was not observed during protocol-level, floristic rare plant surveys. Although the survey was conducted outside of the listed bloom period, this species would have been vegetatively identifiable to genus level at the time of the survey. No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	CONCLUSIONS/ RECOMMENDATIONS
Ahart's paronychia Paronychia ahartii	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.	High Potential. Vernal pools and vernally mesic grassland in the Study Area provide suitable habitat for this species and it has been previously documented within four miles of the Study Area on the same soil series (CDFW 2016).	Not Present. This species was not observed during protocol-level, floristic rare plant surveys. No further actions are recommended for this species.
Bidwell's knotweed Polygonum bidwelliae	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.	High Potential. Grasslands with volcanically derived soils in the Study Area provide ideal habitat for this species and it has been previously documented within 1/4 mile of the Study Area on the same soil series in 2005 (CCH 2016).	Not Present. This species was not observed during protocol-level, floristic rare plant surveys. No further actions are recommended for this species.
California beaked-rush Rhynchospora californica	Rank 1B.1	Bogs and fens, lower montane coniferous forest, meadows and seeps (seeps), marshes and swamps (freshwater). Elevation ranges from 150 to 3310 feet (45 to 1010 meters). Blooms May to July.	Moderate Potential. Seasonal wetland habitat in the southern portion of the Study Area may provide suitable habitat.	Not Present. This species was not observed during protocol-level, floristic rare plant surveys. No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	CONCLUSIONS/ RECOMMENDATIONS
brownish beaked-rush Rhynchospora capitellata	Rank 2B.2	Lower montane coniferous forest, meadows and seeps, marshes and swamps, upper montane coniferous forest/mesic. Elevation ranges from 150 to 6560 feet (45 to 2000 meters). Blooms July to August.	Moderate Potential. Seasonal wetland habitat in the southern portion of the Study Area may provide suitable habitat.	Not Present. This species was not observed during protocol-level, floristic rare plant surveys. No further actions are recommended for this species.
Butte County checkerbloom Sidalcea robusta	Rank 1B.2	Chaparral, cismontane woodland. Elevation ranges from 300 to 5250 feet (90 to 1600 meters). Blooms April to June.	Unlikely. The Study Area lacks suitable chaparral or woodland habitats.	Not Present. This species was not observed during protocol-level, floristic rare plant surveys. No further actions are recommended for this species.
slender-leaved pondweed <i>Stuckenia filiformis ssp. alpina</i>	Rank 2B.2	Marshes and swamps (assorted shallow freshwater). Elevation ranges from 980 to 7050 feet (300 to 2150 meters). Blooms May to July.	No Potential. The Study Area is well below the elevation range for this species.	Not Present. This species was not observed during protocol-level, floristic rare plant surveys. No further actions are recommended for this species.
Butte County golden clover Trifolium jokerstii	Rank 1B.2	Valley and foothill grassland (mesic), vernal pools. Elevation ranges from 160 to 1260 feet (50 to 385 meters). Blooms March to May.	Unlikely. This species has an extremely narrow range of endemism and is known only from North Table Mountain Ecological Preserve and the immediately surrounding area. The closest known occurrence is more than 10 miles south of the Study Area (CDFW 2016).	Not Present. This species was not observed during protocol-level, floristic rare plant surveys. No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	CONCLUSIONS/ RECOMMENDATIONS
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).	Unlikely. Vernal pools in the Study Area may provide suitable habitat; however, this species is typically associated with clay soils.	Not Present. This species was not observed during protocol-level, floristic rare plant surveys. No further actions are recommended for this species.
Brazilian watermeal Wolffia brasiliensis	Rank 2B.3	Marshes and swamps (assorted shallow freshwater). Elevation ranges from 70 to 330 feet (20 to 100 meters). Blooms April to December.	Unlikely. There are no ponds in the Study Area and none of the seasonal wetlands have a sufficient hydroperiod to support this species.	Not Present. This species was not observed during protocol-level, floristic rare plant surveys. No further actions are recommended for this species.

* Key to status codes:	
FE	Federal Endangered
FT	Federal Threatened
SE	State Endangered
SC	State Candidate
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)

**Potential species occurrence definitions:

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

<u>High Potential</u>. 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.

<u>Moderate Potential</u>. 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.

<u>Unlikely</u>. 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.

<u>No Potential</u>. 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 B

LIST OF PLANT SPECIES OBSERVED IN THE STUDY AREA

Family	Scientific Name	Common Name	Origin	Form	Wetland Status (AW 2016)	Rarity Status	CAL-IPC Status
Adoxaceae	Sambucus nigra ssp. caerulea	Blue elderberry	native	shrub	FAC	-	-
Agavaceae	Chlorogalum angustifolium	Narrow leaved soaproot	native	perennial herb	-	-	-
Agavaceae	Chlorogalum pomeridianum var. pomeridianum	Common soaproot	native	perennial herb	-	-	-
Alismataceae	Alisma triviale	Northern water plantain	native	perennial herb (aquatic)	OBL	-	-
Alliaceae	Allium amplectens	Narrow leaved onion	native	perennial herb (bulb)	-	-	-
Anacardiaceae	Toxicodendron diversilobum	Poison oak	native	vine, shrub	FACU	-	-
Apiaceae	Anthriscus caucalis	Bur chevril	non-native	annual herb, vine	-	-	-
Apiaceae	Eryngium vaseyi	Coyote thistle	native	perennial herb	FACW	-	-
Apiaceae	Yabea microcarpa	Hedge parsley	native	annual herb	FACU	-	-
Apocynaceae	Asclepias speciosa	Showy milkweed	native	perennial herb	FAC	-	-
Asteraceae	Áchyrachaena mollis	Blow wives	native	annual herb	FAC	-	-
Asteraceae	Anthemis cotula	Dog fennel	non-native (invasive)	annual herb	FACU	-	-
Asteraceae	Artemisia douglasiana	California mugwort	native	perennial herb	FAC	-	-
Asteraceae	Blennosperma nanum var. nanum	Common blennosperma	native	annual herb	FACW	-	-
Asteraceae	Brickellia californica	California brickellia	native	perennial herb	FACU	-	-
Asteraceae	Carduus pycnocephalus ssp. pycnocephalus	Italian thistle	non-native	annual herb	-	-	Moderate

Appendix B. List of Plant Species Observed in the Study Area on April 23, April 24, May 17, May 18, and July 12, 2016.

Family	Scientific Name	Common Name	Origin	Form	Wetland Status (AW 2016)	Rarity Status	CAL-IPC Status
Asteraceae	Centaurea solstitialis	Yellow starthistle	non-native (invasive)	annual herb	-	-	High
Asteraceae	Centromadia fitchii	Spikeweed	native	annual herb	FACU	-	-
Asteraceae	Cichorium intybus	Chicory	non-native	perennial herb	FACU	-	-
Asteraceae	Dittrichia graveolens	Stinkwort	non-native (invasive)	annual herb	-	-	Moderate
Asteraceae	Gnaphalium palustre	Lowland cudweed	native	annual herb	FACW	-	-
Asteraceae	Grindelia camporum	Gumweed	native	perennial herb	FACW	-	-
Asteraceae	Helianthus annuus	Hairy leaved sunflower	native	annual herb	FACU	-	-
Asteraceae	Hypochaeris glabra	Smooth cats ear	non-native (invasive)	annual herb	-	-	Limited
Asteraceae	Lactuca serriola	Prickly lettuce	non-native (invasive)	annual herb	FACU	-	-
Asteraceae	Lasthenia fremontii	Vernal pool goldfields	native	annual, perennial herb	OBL	-	-
Asteraceae	Layia fremontii	Fremont's tidy tips	native	annual herb	-	-	-
Asteraceae	Leontodon saxatilis	Hawkbit	non-native	annual herb	FACU	-	-
Asteraceae	Logfia gallica	Narrowleaf cottonrose	non-native	annual herb	-	-	-
Asteraceae	Matricaria discoidea	Pineapple weed	native	annual herb	FACU	-	-
Asteraceae	Micropus californicus var. californicus	Slender cottonweed	native	annual herb	FACU	-	-
Asteraceae	Microseris acuminata	Sierra foothills microseris	native	annual herb	-	-	-
Asteraceae	Psilocarphus brevissimus var. brevissimus	Woolly heads	native	annual herb	FACW	-	-

Family	Scientific Name	Common Name	Origin	Form	Wetland Status (AW 2016)	Rarity Status	CAL-IPC Status
Asteraceae	Psilocarphus oregonus	Woolly marbles	native	annual herb	OBL	-	-
Asteraceae	Senecio sylvaticus	Woodland groundsel	non-native	annual herb	UPL	-	-
Asteraceae	Senecio vulgaris	Common groundsel	non-native	annual herb	FACU	-	-
Asteraceae	Silybum marianum	Milk thistle	non-native (invasive)	annual, perennial herb	-	-	Limited
Asteraceae	Symphyotrichum chilense	Pacific aster	native	perennial herb	FAC	-	-
Asteraceae	Xanthium strumarium	Cocklebur	native	annual herb	FAC	-	-
Betulaceae	Alnus rhombifolia	White alder	native	tree	FACW	-	-
Boraginaceae	Amsinckia intermedia	Common fiddleneck	native	annual herb	-	-	-
Boraginaceae	Heliotropium europaeum	European heliotrope	non-native	annual herb	-	-	-
Boraginaceae	Plagiobothrys fulvus var. campestris	Tawny popcorn flower	native	annual herb	-	-	-
Boraginaceae	Plagiobothrys nothofulvus	Rusty haired popcorn flower	native	annual herb	FAC	-	-
Boraginaceae	Plagiobothrys stipitatus var. micranthus	Common vernal pool allocarya	native	annual herb	FACW	-	-
Brassicaceae	Brassica nigra	Black mustard	non-native (invasive)	annual herb	-	-	Moderate
Brassicaceae	Cardamine oligosperma	Idaho bittercress	native	annual, perennial herb	FAC	-	-
Brassicaceae	Hirschfeldia incana	Mustard	non-native (invasive)	perennial herb	-	-	Moderate
Brassicaceae	Lepidium nitidum	Shining pepper grass	native	annual herb	FAC	-	-
Brassicaceae	Nasturtium officinale	Watercress	native	perennial herb (aquatic)	OBL	-	-

Family	Scientific Name	Common Name	Origin	Form	Wetland Status (AW 2016)	Rarity Status	CAL-IPC Status
Brassicaceae	Raphanus raphanistrum	Jointed charlock	non-native	annual, perennial herb	-	-	-
Brassicaceae	Raphanus sativus	Jointed charlock	non-native (invasive)	annual, biennial herb	-	-	Limited
Campanulaceae	Downingia bicornuta var. bicornuta	Bristled downingia	native	annual herb	OBL	-	-
Campanulaceae	Downingia ornatissima var. ornatissima	Horned downingia	native	annual herb	OBL	-	-
Caryophyllaceae	Cerastium glomeratum	Large mouse ears	non-native	annual herb	UPL	-	-
Caryophyllaceae	Petrorhagia dubia	Windmill pink	non-native	annual herb	-	-	-
Caryophyllaceae	Spergularia rubra	Purple sand spurry	non-native	annual, perennial herb	FAC	-	-
Chenopodiaceae	Chenopodium strictum var. glaucophyllum	White leaved goosefoot	non-native	annual herb	-	-	-
Chenopodiaceae	Salsola tragus	Russian thistle	non-native (invasive)	annual herb	FACU	-	Limited
Convolvulaceae	Convolvulus arvensis	Field bindweed	non-native (invasive)	perennial herb, vine	-	-	-
Convolvulaceae	Cuscuta howelliana	Boggs lake dodder	native	vine	-	-	-
Crassulaceae	Crassula tillaea	Mediterranean pygmy weed	non-native	annual herb	FACU	-	-
Crassulaceae	Sedella pumila	Sierra mock stonecrop	native	annual herb	FAC	-	-
Cyperaceae	Cyperus eragrostis	Tall cyperus	native	perennial grasslike herb	FACW	-	-
Cyperaceae	Eleocharis macrostachya	Spike rush	native	perennial grasslike herb	OBL	-	-
Cyperaceae	Schoenoplectus tabernaemontani	Softstem bulrush	native	perennial grasslike herb	OBL	-	-
Euphorbiaceae	Croton setiger	Turkey-mullein	native	perennial herb	-	-	-

Family	Scientific Name	Common Name	Origin	Form	Wetland Status (AW 2016)	Rarity Status	CAL-IPC Status
Euphorbiaceae	Euphorbia maculata	Spotted spurge	non-native	annual herb	UPL	-	-
Euphorbiaceae	Euphorbia ocellata ssp. ocellata	Valley spurge	native	annual, perennial herb	-	-	-
Euphorbiaceae	Euphorbia peplus	Petty spurge	non-native	annual herb	-	-	-
Fabaceae	Acmispon americanus var. americanus	Spanish lotus	native	annual herb	UPL	-	-
Fabaceae	Acmispon brachycarpus	Short podded lotus	native	annual herb	-	-	-
Fabaceae	Lupinus nanus	Valley sky lupine	native	annual herb	-	-	-
Fabaceae	Medicago lupulina	Black medick	non-native	annual, perennial herb	FAC	-	-
Fabaceae	Medicago polymorpha	California burclover	non-native (invasive)	annual herb	FACU	-	Limited
Fabaceae	Trifolium depauperatum var. depauperatum	Dwarf bladder clover	native	annual herb	FAC	-	-
Fabaceae	Trifolium hirtum	Rose clover	non-native (invasive)	annual herb	-	-	Limited
Fabaceae	Trifolium microcephalum	Small head clover	native	annual herb	FAC	-	-
Fabaceae	Trifolium variegatum	Variegated clover	native	annual herb	FAC	-	-
Fabaceae	Trifolium willdenovii	Tomcat clover	native	annual herb	FACW	-	-
Fabaceae	Vicia villosa	Hairy vetch	non-native (invasive)	annual herb, vine	-	-	-
Fagaceae	Quercus douglasii	Blue oak	native	tree	-	-	-
Fagaceae	Quercus lobata	Valley oak	native	tree	FACU	-	-
Fagaceae	Quercus wislizeni var. wislizeni	Interior live oak	native	tree, shrub	-	-	-
Gentianaceae	Centaurium tenuiflorum	Slender centaury	non-native	annual herb	FACW	-	-

Family	Scientific Name	Common Name	Origin	Form	Wetland Status (AW 2016)	Rarity Status	CAL-IPC Status
Gentianaceae	Cicendia quadrangularis	Common microcalis	native	annual herb	FAC	-	-
Gentianaceae	Zeltnera muehlenbergii	Muehlenberg's centaury	native	annual herb	FAC	-	-
Geraniaceae	Erodium botrys	Big heron bill	non-native (invasive)	annual herb	FACU	-	-
Geraniaceae	Erodium cicutarium	Coastal heron's bill	non-native (invasive)	annual herb	-	-	Limited
Geraniaceae	Erodium moschatum	Whitestem filaree	non-native (invasive)	annual herb	-	-	-
Geraniaceae	Geranium carolinianum	Carolina geranium	native	annual herb	-	-	-
Geraniaceae	Geranium dissectum	Wild geranium	non-native (invasive)	annual herb	-	-	Limited
Hypericaceae	Hypericum perforatum ssp. perforatum	Klamathweed	non-native	perennial herb	FACU	-	-
Juncaceae	Juncus balticus ssp. ater	Baltic rush	native	perennial grasslike herb	FACW	-	-
Juncaceae	Juncus bufonius	Common toad rush	native	annual grasslike herb	FACW	-	-
Juncaceae	Juncus uncialis	Inch high dwarf rush	native	annual grasslike herb	OBL	-	-
Juncaginaceae	Triglochin scilloides	Flowering- quillwort	native	annual herb (aquatic)	OBL	-	-
Lamiaceae	Mentha spicata	Spearmint	non-native	perennial herb	FACW	-	-
Lamiaceae	Pogogyne zizyphoroides	Sacramento mint	native	annual herb	OBL	-	-
Lamiaceae	Trichostema lanceolatum	Vinegarweed	native	annual herb	FACU	-	-
Liliaceae	Calochortus luteus	Yellow mariposa	native	perennial herb	-	-	-
Liliaceae	Calochortus superbus	Yellow mariposa	native	perennial herb	-	-	-

Family	Scientific Name	Common Name	Origin	Form	Wetland Status (AW 2016)	Rarity Status	CAL-IPC Status
Limnanthaceae	Limnanthes douglasii ssp. rosea	Rosy douglas' meadowfoam	native	annual herb	OBL	-	-
Limnanthaceae	Limnanthes floccosa ssp. californica	Butte county meadowfoam	native	annual herb	OBL	FE, SE, Rank 1B.1	-
Lythraceae	Lythrum hyssopifolia	Hyssop loosestrife	non-native	annual, perennial herb	OBL	-	-
Malvaceae	Sidalcea hartwegii	Hartweg's checkerbloom	native	annual herb	-	-	-
Montiaceae	Montia fontana	Water montia	native	annual herb	OBL	-	-
Moraceae	Ficus carica	Common fig	non-native (invasive)	tree	FACU	-	Moderate
Oleaceae	Fraxinus dipetala	Two petaled ash	native	tree, shrub	-	-	-
Oleaceae	Fraxinus latifolia	Oregon ash	native	tree	FACW	-	-
Onagraceae	Clarkia gracilis	Graceful clarkia	native	annual herb	-	-	-
Onagraceae	Clarkia purpurea ssp. quadrivulnera	Purple clarkia	native	annual herb	-	-	-
Onagraceae	Epilobium ciliatum	Slender willow herb	native	perennial herb	FACW	-	-
Onagraceae	Epilobium torreyi	Narrow boisduvalia	native	annual herb	FACW	-	-
Orobanchaceae	Castilleja attenuata	Narrow leaved owl's clover	native	annual herb	-	-	-
Orobanchaceae	Triphysaria eriantha ssp. eriantha	Butter 'n' eggs	native	annual herb	-	-	-
Oxalidaceae	Oxalis micrantha	Dwarf woodsorrel	non-native	annual herb	-	-	-
Papaveraceae	Eschscholzia californica	California poppy	native	annual, perennial herb	-	-	-
Papaveraceae	Eschscholzia lobbii	Frying pans	native	annual herb	-	-	-
Phrymaceae	Mimulus glaucescens	Shield-bracted monkey flower	native	annual, perennial herb (rhizomatous)	OBL	Rank 4.3	-

Family	Scientific Name	Common Name	Origin	Form	Wetland Status (AW 2016)	Rarity Status	CAL-IPC Status
Phrymaceae	Mimulus guttatus	Yellow monkey flower	native	annual, perennial herb (rhizomatous)	OBL	-	-
Phytolaccaceae	Phytolacca americana var. americana	American pokeweed	non-native	perennial herb	FAC	-	-
Plantaginaceae	Gratiola ebracteata	Common hedge hyssop	native	annual herb	OBL	-	-
Plantaginaceae	Plantago erecta	California plantain	native	annual herb	-	-	-
Plantaginaceae	Plantago lanceolata	Ribwort	non-native (invasive)	perennial herb	FAC	-	Limited
Poaceae	Aira caryophyllea	Silvery hairgrass	non-native (invasive)	annual grass	FACU	-	-
Poaceae	Alopecurus saccatus	Foxtail	native	annual grass	OBL	-	-
Poaceae	Avena barbata	Slim oat	non-native (invasive)	annual, perennial grass	-	-	Moderate
Poaceae	Avena fatua	Wildoats	non-native (invasive)	annual grass	-	-	Moderate
Poaceae	Briza minor	Little rattlesnake grass	non-native	annual grass	FAC	-	-
Poaceae	Bromus diandrus	Ripgut brome	non-native (invasive)	annual grass	-	-	Moderate
Poaceae	Bromus hordeaceus	Soft chess	non-native (invasive)	annual grass	FACU	-	Limited
Poaceae	Bromus madritensis ssp. rubens	Foxtail chess, foxtail brome	non-native	annual grass	UPL	-	Moderate
Poaceae	Cynodon dactylon	Bermuda grass	non-native (invasive)	perennial grass	FACU	-	Moderate
Poaceae	Deschampsia danthonioides	Annual hairgrass	native	annual grass	FACW	-	-
Poaceae	Elymus caput- medusae	Medusa head	non-native	annual grass	-	-	-
Poaceae	Festuca microstachys	Small fescue	native	annual grass	-	-	-

Family	Scientific Name	Common Name	Origin	Form	Wetland Status (AW 2016)	Rarity Status	CAL-IPC Status
Poaceae	Festuca myuros	Rattail sixweeks grass	non-native (invasive)	annual grass	FACU	-	-
Poaceae	Festuca perennis	Italian rye grass	non-native	annual, perennial grass	FAC	-	-
Poaceae	Gastridium phleoides	Nit grass	non-native	annual grass	FACU	-	-
Poaceae	Hordeum marinum ssp. gussoneanum	Barley	non-native	annual grass	FAC	-	-
Poaceae	Hordeum murinum	Foxtail barley	non-native (invasive)	annual grass	FACU	-	-
Poaceae	Paspalum dilatatum	Dallis grass	non-native	perennial grass	FAC	-	-
Poaceae	Phragmites australis	Common reed	native	perennial grass	FACW	-	-
Poaceae	Poa annua	Annual blue grass	non-native	annual grass	FAC	-	-
Poaceae	Polypogon monspeliensis	Annual beard grass	non-native (invasive)	annual grass	FACW	-	Limited
Poaceae	Sorghum halepense	Johnsongrass	non-native (invasive)	perennial grass	FACU	-	-
Poaceae	Stipa pulchra	Purple needle grass	native	perennial grass	-	-	-
Polemoniaceae	Navarretia intertexta	Interwoven navarretia	native	annual herb	FACW	-	-
Polemoniaceae	Navarretia leucocephala ssp. leucocephala	White headed navarretia	native	annual herb	OBL	-	-
Polemoniaceae	Navarretia tagetina	Marigold navarretia	native	annual herb	FACW	-	-
Polygonaceae	Persicaria Iapathifolia	Common knotweed	native	annual herb	FACW	-	-
Polygonaceae	Polygonum aviculare ssp. aviculare	Prostrate knotweed	non-native	annual, perennial herb	FACW	-	-
Polygonaceae	Rumex crispus	Curly dock	non-native (invasive)	perennial herb	FAC	-	Limited

Family	Scientific Name	Common Name	Origin	Form	Wetland Status (AW 2016)	Rarity Status	CAL-IPC Status
Primulaceae	Primula clevelandii	Padre's shooting star	native	perennial herb	-	-	-
Pteridaceae	Pentagramma triangularis	Gold back fern	native	fern	-	-	-
Ranunculaceae	Delphinium variegatum ssp. variegatum	Royal larkspur	native	perennial herb	-	-	-
Ranunculaceae	Ranunculus arvensis	Field buttercup	non-native	annual herb	FACU	-	-
Ranunculaceae	Ranunculus bonariensis var. trisepalus	Vernal pool buttercup	native	annual herb	OBL	-	-
Ranunculaceae	Ranunculus muricatus	Buttercup	non-native	annual, perennial herb	FACW	-	-
Rhamnaceae	Frangula californica	California coffeeberry	native	shrub	-	-	-
Rosaceae	Rubus armeniacus	Himalayan blackberry	non-native (invasive)	shrub	FAC	-	High
Rubiaceae	Galium aparine	Cleavers	native	annual herb	FACU	-	-
Rubiaceae	Galium murale	Tiny bedstraw	non-native	annual herb	-	-	-
Rubiaceae	Galium parisiense	Wall bedstraw	non-native	annual herb	UPL	-	-
Rubiaceae	Sherardia arvensis	Field madder	non-native	annual herb	-	-	-
Salicaceae	Populus fremontii ssp. fremontii	Cottonwood	native	tree	FAC	-	-
Salicaceae	Salix gooddingii	Gooding's willow	native	tree	FACW	-	-
Scrophulariaceae	Verbascum blattaria	Moth mullein	non-native	perennial herb	UPL	-	-
Tecophilaeaceae	Odontostomum hartwegii	Hartweg's odontostomum	native	perennial herb	-	-	-
Themidaceae	Brodiaea coronaria	Harvest brodiaea	native	perennial herb (bulb)	FAC	-	-
Themidaceae	Brodiaea minor	Low brodiaea	native	perennial herb	-	-	-

Family	Scientific Name	Common Name	Origin	Form	Wetland Status (AW 2016)	Rarity Status	CAL-IPC Status
Themidaceae	Dichelostemma capitatum ssp. capitatum	Wild hyacinth	native	perennial herb	FACU	-	-
Themidaceae	Dichelostemma multiflorum	Many flowered brodiaea	native	perennial herb	-	-	-
Themidaceae	Triteleia hyacinthina	Wild hyacinth	native	perennial herb	FAC	-	-
Typhaceae	Typha angustifolia	Narrow leaf cattail	non-native	perennial herb (aquatic)	OBL	-	-
Vitaceae	Vitis californica	California wild grape	native	vine, shrub	FACU	-	-
Zygophyllaceae	Tribulus terrestris	Puncture vine	non-native (invasive)	annual herb	-	-	-

APPENDIX C

REPRESENTATIVE PHOTOGRAPHS OF THE STUDY AREA

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Growth habit of Butte County meadowfoam seen in the Study Area



Close-up of Butte County meadowforam showing scale.



Close-up of the habitat of Butte County meadowfoam.



Habitat in which the Butte County meadowfoam was observed within the Study Area.



Appendix C. Representative Photographs of Butte County meadowfoam in the Study Area

All photos taken April 23 or April 24, 2016



Close up of inflorescence of Butte County meadowfoam. Notice the sepals enclosing the seeds as well as the cottony hairs on the inside of the sepals.



Close up of Butte County meadowfoam.



Close up of Butte County meadowfoam.



Close up of Butte County meadowfoam nutlets.



Appendix C. Representative Photographs of Butte County meadowfoam in the Study Area

All photos taken April 23 or April 24, 2016