

Biological Resources Assessment

APN 002-180-084 Bruce Road and Highway 32 Parcel Map Butte County, California

April 2018



Prepared for:

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List of Abbreviated Terms

BCM	Butte County Meadowfoam
BSA	Biological Survey Area
Caltrans	California Department of Transportation
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFGC	California Fish and Game Code
CNDDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CWA	Clean Water Act
CWHR	California Wildlife Habitat Relationships
EPA	U.S. Environmental Protection Agency
ESA	Federal Endangered Species Act
GGs	Giant Garter Snake
IPAC	Information for Planning and Conservation
MBTA	Migratory Bird Treaty Act
msl	Mean Sea Level
NEPA	National Environmental Policy Act
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRPW	Non-Relatively Permanent Waters
OWOUS	Other Waters of the United States
ROW	Right-of-way
RPW	Relatively Permanent Waters
RWQCB	Regional Water Quality Control Board
SNC	Sensitive Natural Community

SR 32	State Route 32
SWRCB	State Water Resources Control Board
TNW	Traditional Navigable Waters
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WOUS	Waters of the United States

1. EXECUTIVE SUMMARY

NorthStar conducted biological surveys on the approximately 7.14-acre Biological Survey Area (BSA) within APN 002-180-084 Bruce Road and Highway 32 in the eastern side of the City of Chico in Butte County, California. The BSA is composed of mostly disturbed grasslands with a small area section of the South Fork of Dead Horse Slough. There are no permanent structures present within the BSA. The South Fork of Dead Horse Slough runs approximately south to north through the northeastern portion of the parcel. Three surveys were conducted on March 22, 2016 by NorthStar biologist Carol Wallen and qualified consulting botanist, Mary Bailey; March 28, 2017 by NorthStar biologist Matt Rogers and Andrew Huneycutt; and April 26, 2018 by NorthStar biologist Matt Rogers to determine the presence of sensitive biological resources within the BSA and to determine if these resources would be impacted by subsequent development of the project site.

Due to the disturbed nature of the site, suitable habitat for special-status plant species is minimal. Only one special-status plant species, Butte County meadowfoam (BCM) (*Limnanthes floccosa* ssp. *californica*) was determined to have a moderate potential to occur within the BSA. Two protocol level surveys with negative results for presence of BCM, were completed on the site in March of 2016 and 2017. Additionally, during the April 2018 survey no BCM was encountered within the project area.

The vernal pools present within the BSA provide suitable habitat for special-status vernal pool crustaceans including vernal pool tadpole shrimp (*Lepidurus packardi*) and vernal pool fairy shrimp (*Branchinecta lynchi*).

The BSA potentially provides suitable habitat for one listed reptile and one listed amphibian species including northwestern pond turtle (*Actinemys marmorata*) and western spadefoot (*Spea hammondi*).

The BSA provides potentially suitable nesting and foraging habitat for loggerhead shrike (*Lanius ludovicianus*), Swainson's hawk (*Buteo swainsoni*) and a variety of migratory birds protected by the Migratory Bird Treaty Act (MBTA) within the open grassland and small trees within the property boundaries.

The BSA contains potentially jurisdictional aquatic resources. The types of aquatic features identified within the project parcel were distinguished as Other Waters of the United States (OWOUS) and vernal pool. If impacts to any wetlands identified on the site are proposed, the appropriate federal, state, and local permits will be necessary prior to the start of any development, including grading activities.

2. INTRODUCTION

NorthStar conducted biological surveys within a 7.14 acre Biological Survey Area (BSA) within APN 002-180-084 Bruce Road and Highway 32 in Chico, California. The BSA is located on the eastern side of the City of Chico in Butte County, California in Section 19, Township 22 N Range 2 E, of the Chico U.S. Geological Survey (USGS) 7.5-minute quadrangle (**Figure 1**). Surveys were conducted on March 22, 2016 by NorthStar biologist, Carol Wallen and qualified consulting botanist, Mary Bailey, on March 28, 2017 by NorthStar biologists Matt Rogers and Andrew Huneycutt and April 26, 2018 by NorthStar biologist, Matt Rogers to determine the presence of sensitive natural resources and to determine if these resources would be impacted by the proposed projects.

2.1 Project Description

The proposed project involves a parcel map and a separate, yet concurrent, use permit application with the city of Chico.

3. METHODS

The BSA was established by setting a 200-foot buffer around the project parcel to the northeast and south (APN 002-180-084) and this includes areas not within the resulting parcel or project boundaries. The BSA was not extended west of Bruce Road, as the areas are no longer hydrologically linked subsequent development would not result in direct or indirect effects to adjacent parcels.

3.1 Biological Resources

3.1.1 *Sensitive Natural Communities*

Using Rarefind 5 NorthStar accessed the California Department of Fish and Wildlife's (CDFW) California Natural Diversity Database (CNDDDB) to identify Sensitive Natural Communities (SNCs) occurring on the Chico and eight surrounding USGS 7.5-minute quadrangles. These SNCs were then surveyed for within the BSA during the field visit.

3.1.2 *Critical Habitat*

NorthStar determined if United States Fish and Wildlife Service (USFWS)-designated critical habitat for special-status species occurs in the BSA by reviewing the USFWS Information for Planning and Conservation (IPAC) database for the project site.

3.1.3 *Special-Status Species*

NorthStar obtained lists of special-status species that potentially occur in the vicinity of the BSA from the USFWS IPAC (USFWS, **Appendix A**), the CDFW's CNDDDB, (**Appendix B**), and the California Native Plant Society's (CNPS) Online Rare and Endangered Plant Inventory v8-02 (**Appendix C**).

Figure 1. Project location map

Three biological surveys were conducted within the BSA on March 22, 2016 by NorthStar biologist, Carol Wallen and qualified consulting botanist, Mary Bailey, on March 28, 2017 by NorthStar biologists Matt Rogers and Andrew Huneycutt, and April 26, 2018 by NorthStar biologist Matt Rogers. General biological resource surveys and habitat assessments were conducted to determine the presence of special-status species and habitats in the BSA and to determine if these resources would be impacted by the proposed project. The survey included conducting meandering transects throughout the BSA, with special focus on habitat types frequently associated with special-status species. Species encountered during biological surveys can be found in **Appendix D**.

Following the field survey, the “potential for occurrence” was determined based on the quality and types of habitats observed on the site. For plants, the potential for occurrence on site is considered during the appropriate survey/flowering period. For birds and bats, the potential for occurrence is considered during the appropriate timeframes when these species breed, forage, roost, over-winter, or stop-over in the BSA during migration. Any bird or bat species could fly over the BSA, but this is not considered a potential for occurrence. The categories for the potential for occurrence include:

- **None:** The species or natural community is known not to occur and has no potential to occur in the BSA based on sufficient surveys, the lack of suitable habitat (including soil, vegetation, connectivity, etc.), and/or the BSA is well outside of the known distribution of the species.
- **Low:** Potential habitat in the BSA is sub-marginal and the species is not known to occur in the vicinity of the BSA. Protocol-level surveys are not recommended.
- **Moderate:** Suitable habitat is present in the BSA and the species is known to occur in the vicinity of the BSA.
- **High:** Habitat in the BSA is highly suitable for the species and there are reliable records close to the BSA, but the species was not observed.
- **Known:** The species or natural community was detected in the BSA or a recent reliable record exists for the BSA.

3.2 Waters of the United States

A verified delineation of aquatic resources was performed on the site on March 12 and 29, 2007 (SPK-200701149). The delineation involved an examination of botanical resources, soils, hydrological features, and determination of wetland characteristics based on the *U.S. Army Corps of Engineers Wetlands Delineation Manual* (USACE 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (USACE 2008), and the *U.S. Army Corps of Engineers Jurisdictional Determination Form Instructional Guidebook* (USACE 2007).

3.3 Previous Surveys

On March 22, 2016 and March 28, 2017 NorthStar biologists conducted protocol level surveys for BCM within the BSA. The entire site was surveyed on foot using meandering transects and all suitable habitat was closely inspected for BCM. The reports from these protocol level surveys can be found in **Appendix E**.

4. RESULTS

4.1 Existing Conditions

The project site is located on the eastern side of the City of Chico at the southeastern corner of the intersection of Bruce Road and State Route 32 (SR 32). The project parcel is bordered by State Highway 32 on the north, the Oak Valley subdivision to the south, open grassland to the east, and Bruce Road to the west. The proposed project site consists of annual grassland with a few scattered trees and an approximately 300-foot-long portion of the South Fork of Dead Horse Slough on the northeastern portion of the site.

Soils within the project area consist of two mapped soil units, Redtough-Redswale Gravelly Loam, 0-2% slopes and Doemill-Jokerst, 3-8% slopes. General characteristics associated with these soil types are described below.

- **Redtough-Redswale gravelly loam, 0-2% slopes:** This soil type is typically deep and moderately well drained, found in low fan terraces from elevations of 180-400 feet above mean sea level (msl). Vegetation associated with this soil type includes annual grasses and herbaceous species.
- **Doe Mill-Jokerst, 3-8% slopes:** This soil type is found in the foothill region of the Cascade Range from 160-1,000 feet above msl. It is shallow and somewhat poorly drained. This soil is typical of the mound and swale (mima mound) topography found within the eastern foothills near Chico. Natural vegetation associated with this soil type includes annual grasses and herbaceous species.

Topography on the site is gently sloping towards the west with an elevation of approximately 250 feet above msl. The South Fork of Dead Horse Slough occurs within the site and flows in a south to north direction. This drainage exits the site via a box culvert beneath Highway 32 along the northern boundary of the property.

4.2 Habitat Types

California habitat types are described in the California Wildlife Habitat Relationships (CWHR) system based on classifications created by Mayer and Laudenslayer (1988). The CWHR system was designed to aid in the mapping of habitats utilized by California's commonly-occurring birds, mammals, reptiles, and amphibians.

The BSA is composed almost exclusively of annual grassland, a small section of riverine habitat is found in the northeastern portion of the property comprised of the South Fork of Dead Horse Slough.

4.2.1 Annual Grassland

As described by Mayer and Laudenslayer, annual grassland habitats can be found throughout California and generally consist of a variety of introduced invasive species. Species composition is strongly influenced by abiotic factors and compositional changes fluctuate seasonally due to

the phenology of plants found within an area. Common plant species found within the site include numerous introduced grass species such as slender oat (*Avena barbata*), Italian ryegrass (*Festuca perennis*), hare barley (*Hordeum murinum* ssp. *leporinum*), and medusa head (*Elymus caput-medusae*). Common forbs encountered included yellow star thistle (*Centaurea solstitialis*), spikeweed (*Centromadia fitchii*), vinegarweed (*Trichostema lanceolatum*), turkey mullein (*Croton setigerus*), and clover (*Trifolium* spp.).

A number of species use annual grasslands for breeding and foraging. Species encountered during surveys included western fence lizard (*Sceloporus occidentalis*), western meadowlark (*Sturnella neglecta*), lesser goldfinch (*Spinus psaltria*), and western kingbird (*Tyrannus verticalis*).

4.2.2 Riverine

Riverine habitats consist of intermittent or perennial running water. Higher elevation rivers and streams tend to be smaller and higher velocity. At lower elevations, rivers and streams become slow and enlarged. The transition from higher elevation to lower will cause temperature and turbidity to increase, dissolved oxygen will decrease and the bottom will transition from rocky towards muddy or silty. Riverine habitats are found in close association with terrestrial habitats and in many cases, are contiguous with lake and emergent wetland habitats.

Riverine habitat is present as the South Fork of Dead Horse Slough. The South Fork of Dead Horse Slough is an intermittent creek that contains flow during the winter and spring months secondarily to precipitation events. The channel is dry during the summer and fall months. Seasonal precipitation events during the winter months and localized runoff from the surrounding areas likely contribute to the hydrology observed in the canal.

Wildlife observed in the riverine habitat within the project area included great blue heron, mallard, wood duck, black phoebe, red swamp crawfish, and an unidentified freshwater mussel.

4.3 Sensitive Natural Communities

Sensitive natural communities (SNCs) are important ecologically as their elimination or degradation could threaten populations of dependent plant and wildlife species and significantly reduce the regional distribution and viability of the community. The loss of SNCs may eliminate or reduce important ecosystem functions including water filtration by wetlands or bank stabilization by riparian woodlands.

One sensitive natural community was present within the BSA. Several small Northern hardpan vernal pools are present within the project parcel (APN 002-180-084).

Northern hardpan vernal pools occur on old alluvial fans along the eastern portion of California's Central Valley. The hardpan layers are formed by leaching, redeposition, and cementing of silica minerals higher in the soil profile. Northern hardpan vernal pools tend to be found in acidic soils and generally exhibit rounded soil mounds commonly referred to as mima mound topography.

4.4 Critical Habitat

Critical habitat for vernal pool tadpole shrimp (*Lepidurus packardi*), vernal pool fairy shrimp (*Branchinecta lynchi*), and Butte County meadowfoam occurs within the BSA. Three vernal pools occur within the survey area; two of these vernal pools occur within the project boundaries and will be mitigated for accordingly. Due to the 200 foot survey buffer around the project area the additional vernal pool is located within the survey area but outside of the proposed parcel map area. Although the project site is in close proximity to known populations of Butte County meadowfoam multiyear surveys have been conducted within the BSA and no populations of Butte County meadowfoam have been observed.

4.5 Special-Status Species

All of the special-status species listed by the USFWS, CDFW, and CNPS as occurring within the Chico and/or eight surrounding USGS quadrangles are presented in **Table 1** along with their assessed potential to occur within the BSA. A map of all CNDDDB special-status species occurrences within five miles of the BSA is provided in **Figure 2**. The special-status species with the potential to occur within the BSA are Butte County meadowfoam, vernal pool crustaceans, northwestern pond turtle (*Actinemys marmorata*), and western spadefoot (*Spea hammondi*). Additionally, suitable habitat for loggerhead shrike (*Lanius ludovicianus*), Swainson's hawk (*Buteo swainsoni*), and a variety of other migratory birds and raptors occurs within the BSA.

Figure 2. CNDDDB occurrences in the vicinity of the Biological Survey Area.

Table 1. Special-status Species and Sensitive Natural Communities Identified by USFWS, CNDDDB, and CNPS as Potentially Occurring in the Biological Survey Area.

Common Name (Scientific Name)	Status Fed/State/ CNPS	Associated Habitats	Potential for Occurrence*
SENSITIVE NATURAL COMMUNITIES			
Coastal and Valley Freshwater Marsh	_/_SNC/_/	Occurs near river mouths, oxbows, and other areas in the floodplain, and along margins of lakes and springs, where water is quiet and permanently flooded by freshwater. Dominated by perennial, emergent monocots 4-5 meters tall.	<u>None</u> : Does not occur within the BSA.
Great Valley Cottonwood Riparian Forest	_/_SNC/_/	Perennial creeks and rivers in the Central Valley.	<u>None</u> : Does not occur within the BSA.
Great Valley Mixed Riparian Forest	_/_SNC/_/	A tall, dense, winter-deciduous, broadleaved riparian forest. The tree canopy is usually fairly well closed and moderately to densely stocked with several species including <i>Acer negundo</i> , <i>Juglans hindsii</i> , <i>Platanus racemosa</i> , <i>Populus fremontii</i> , and <i>Salix</i> spp.	<u>None</u> : Does not occur within the BSA.
Great Valley Valley Oak Riparian Forest	_/_SNC/_/	Occurs on the deep alluvial soils of higher floodplain terraces in association with river systems. Can also be found in other upland communities.	<u>None</u> : Does not occur within the BSA.
Great Valley Willow Scrub	_/_SNC/_/	Pioneer riparian community found on depositional areas near the edge of intermittent and perennial creeks and rivers.	<u>None</u> : Does not occur within the BSA.
Northern Basalt Flow Vernal Pool	_/_SNC/_/	Associated with low- to mid-elevation seasonally flooded depressions on impermeable soils.	<u>None</u> : Does not occur within the BSA.
Northern Hardpan Vernal Pool	_/_SNC/_/	Seasonally flooded depressions on impermeable soils or rock.	<u>Known</u> : Occurs in the BSA.
Northern Volcanic Mud Flow Vernal Pool	_/_SNC/_/	Seasonally flooded depressions on impermeable soils or rock.	<u>None</u> : Does not occur within the BSA.
PLANTS			
Adobe Lily (<i>Fritillaria pluriflora</i>)	_/_/_/1B.2	Chaparral, cismontane woodland, valley and foothill grassland. (Feb-Apr)	<u>None</u> : Sub-marginal habitat present in the BSA. None were found during biological surveys of the project area.
Adobe Navarretia (<i>Navarretia nigelliformis</i> ssp. <i>nigelliformis</i>)	_/_/_/4.2	Clay, sometimes serpentinite. Valley and foothill grassland vernally mesic, vernal pools sometimes (Apr-Jun)	<u>Low</u> : Sub-marginal vernal pool habitat occurs within the BSA.
Ahart's Buckwheat (<i>Eriogonum umbellatum</i> var. <i>ahartii</i>)	_/_/_/1B.2	Serpentinite soils, openings, and slopes in chaparral and cismontane woodland. (Jun-Sep)	<u>None</u> : No suitable chaparral or woodland habitat present within the BSA.
Ahart's Paronychia (<i>Paronychia ahartii</i>)	_/_/_/1B.1	Cismontane woodland, valley and foothill grassland, and vernal pools. (Mar-Jun)	<u>Low</u> : Sub-marginal grassland habitat present within the BSA. Vernal pool habitat present. None were

Common Name (Scientific Name)	Status Fed/State/ CNPS	Associated Habitats	Potential for Occurrence*
			encountered during survey.
Bidwell's Knotweed (<i>Polygonum bidwelliae</i>)	___/___/4	Chaparral, cismontane woodland, and volcanic valley foothill and grassland, 60-1200 meters. (April-July)	<u>Known</u> . Observed within the BSA.
Big-scale Balsam Root (<i>Balsamorhiza macrolepis</i> var. <i>macrolepis</i>)	___/___/1B.2	Cismontane woodlands and chaparral. Valley and Foothill grasslands. Sometimes serpentinite. (Mar-June)	<u>Low</u> : Sub-marginal grassland habitat present within the BSA.
Brassy Bryum (<i>Bryum chryseum</i>)	___/___/4.3	Chaparral (openings), cismontane woodlands, valley and foothill grassland.	<u>Low</u> : Sub-marginal grassland habitat occurs within the BSA.
Brazilian Watermeal (<i>Wolffia brasiliensis</i>)	___/___/2B.3	Marshes and swamps (shallow freshwater). (Apr-Dec)	<u>None</u> : No suitable marsh or swamp habitat present within the BSA.
Brownish Beaked-Rush (<i>Rhynchospora capitellata</i>)	___/___/2B.2	Lower montane coniferous forest, meadows and seeps, marshes and swamps, upper montane coniferous forest.	<u>Low</u> : Sub-marginal mesic habitat present within the BSA.
Butte County Calycadenia (<i>Calycadenia oppositifolia</i>)	___/___/4.2	Chaparral, cismontane woodland, lower montane coniferous forest, meadows and seeps, valley and foothill grassland. (Apr-Jul)	<u>Low</u> : Sub-marginal grassland occurs within the BSA.
Butte County Checkerbloom (<i>Sidalcea robusta</i>)	___/___/1B.2	Chaparral and cismontane woodland. (Apr-Jun)	<u>None</u> : No suitable chaparral or woodland habitats present within the BSA.
Butte County Fritillary (<i>Fritillaria eastwoodiae</i>)	___/___/3.2	Chaparral, cismontane woodland, openings in lower montane coniferous forests, sometimes serpentinite. (Mar-Jun)	<u>None</u> : No suitable chaparral or coniferous habitat present within the BSA.
Butte County Golden Clover (<i>Trifolium jokerstii</i>)	___/___/1B.2	Valley and foothill grassland, vernal pools. (Mar-May)	<u>Low</u> : Sub-marginal grassland habitat present within the BSA; most occurrences are around Table Mountain near Oroville, CA.
Butte County Meadowfoam (<i>Limnanthes floccosa</i> ssp. <i>californica</i>)	FE/SE/1B.1	Valley and foothill grassland, vernal pools. (Mar-May)	<u>Moderate</u> : Suitable grassland habitat present and known occurrences in the area around the BSA.
Butte County Morning-glory (<i>Calystegia atriplicifolia</i> ssp. <i>buttensis</i>)	___/___/4	Chaparral and rocky lower montane coniferous forest, sometimes roadsides. (May-Jul)	<u>None</u> . No suitable habitat present within the BSA.
California Beaked-rush (<i>Rhynchospora californica</i>)	___/___/1B.1	Bogs and fens, lower montane coniferous forest, meadows and seeps, and marshes and swamps. (May-Jul)	<u>None</u> : No suitable marsh habitat present within the BSA.
California Satintail (<i>Imperata brevifolia</i>)	___/___/2B.1	Chaparral, coastal scrub, Mojavean desert scrub, meadows and seeps (often alkali), and mesic riparian scrub, 0-500 meters. (Sep-May)	<u>Low</u> : Sub-marginal mesic habitat present within the BSA.
Depauperate Milk-Vetch (<i>Astragalus pauperculus</i>)	___/___/4.3	Vernally mesic, volcanic, chaparral, cismontane woodland, valley and foothill grassland. (Mar-Jun)	<u>Low</u> : Sub-marginal vernal mesic grassland habitat occurs within the BSA.
Dissected-leaved Toothwort (<i>Cardamine pachystigma</i> var. <i>dissectifolia</i>)	___/___/1B.2	Chaparral and lower montane coniferous forests, usually serpentinite and rocky. (Feb-May)	<u>None</u> : No suitable chaparral or coniferous forest habitat present within the BSA.

Common Name (Scientific Name)	Status Fed/State/ CNPS	Associated Habitats	Potential for Occurrence*
Ferris's Milk-vetch (<i>Astragalus tener</i> var. <i>ferrisiae</i>)	___/___/1B.1	Meadows and seeps, valley and foothill grassland. (Apr-May)	<u>Low</u> : Sub-marginal mesic habitat present within the BSA.
Flagella-like Atractylorpus (<i>Campylopodia stenocarpa</i>)	___/___/2B.2	Cismontane woodland, 100-500 meters.	<u>None</u> : No suitable woodland habitat present within the BSA.
Greene's Tuctoria (<i>Tuctoria greenei</i>)	FE/___/1B.1	Vernal pools. (May-Jul/Sept)	<u>Low</u> : Vernal pool habitat present in the Caltrans ROW. However, there are no occurrences within five miles of the BSA.
Hairy Orcutt Grass (<i>Orcuttia pilosa</i>)	FE/SE/1B	Deep vernal pools. (May-Sept)	<u>Low</u> . Sub-marginal habitat present within the BSA
Hogwallow Starfish (<i>Hesperovax caulescens</i>)	___/___/4.2	Sometimes alkaline. Valley and foothill grassland (mesic, clay), vernal pools (shallow). (Mar-Jun)	<u>None</u> : Sub-marginal vernal pools are present within the BSA. Species not observed during biological surveys of the BSA.
Humboldt Lily (<i>Lilium humboldtii</i> ssp. <i>humboldtii</i>)	___/___/4.2	Openings. Chaparral. Cismontane woodland, and lower montane coniferous forest. (May-Jul(Aug))	<u>None</u> : There is no suitable habitat within the BSA.
Hoover's Spurge (<i>Chamaesyce hooveri</i>)	FT/___/1B.2	Vernal pools. (Jul-Sep/Oct)	<u>Low</u> : Vernal pool habitat present in the Caltrans ROW, no occurrences within five miles of the BSA..
Marsh Claytonia (<i>Claytonia palustris</i>)	___/___/4.3	Meadows and seeps (mesic). Marshes and swamps. Upper montane coniferous forest. (May-Oct)	<u>Low</u> : Sub-marginal mesic habitat is present near the South Fork of Dead Horse Slough.
Mexican mosquito fern (<i>Azolla microphylla</i>)	___/___/4.2	Marshes and swamps (ponds, slow water). (Aug)	<u>Low</u> : Sub-marginal slow moving water is present within the BSA.
Parry's rough tarplant (<i>Centromadia parryi</i> ssp. <i>Rudis</i>)	___/___/4.2	Alkaline, vernal mesic, seeps, sometimes roadsides. Valley and foothill grassland. Vernal pools. (May-Oct)	<u>Low</u> : Sub-marginal vernal pool and grassland habitat is present within the BSA.
Pink Creamsacs (<i>Castilleja rubicundula</i> ssp. <i>rubicundula</i>)	___/___/1B.2	Chaparral, cismontane woodland, meadows and seeps, valley and foothill grassland (serpentine). (Apr-Jun)	<u>Low</u> : Sub-marginal grassland habitat present within the BSA.
Recurved Larkspur (<i>Delphinium recurvatum</i>)	___/___/1B.2	Chenopod scrub, cismontane woodland, valley and foothill grassland (alkaline). (Mar-Jun)	<u>Low</u> : Sub-marginal grassland habitat present within the BSA.
Red Bluff Dwarf Rush (<i>Juncus leiospermus</i> var. <i>leiospermus</i>)	___/___/1B.1	Chaparral, cismontane woodland, meadows and seeps, valley and foothill grassland and vernal pools/vernal mesic habitats. (Mar-May)	<u>Low</u> : Sub-marginal mesic habitat present within the BSA.
Round-leaved Filaree (<i>California macrophylla</i>)	___/___/1B.2	Cismontane woodland, valley and foothill grassland (clay). (Mar-May)	<u>Low</u> : Sub-marginal grassland habitat present within the BSA.
Shield-bracted monkeyflower (<i>Erythranthe glaucescens</i>)	___/___/4.3	Serpentine seeps, sometimes streambanks. Chaparral, cismontane woodland, lower montane coniferous forest, and valley and foothill grassland.	<u>Low</u> : Sub-marginal stream habitat is present within the BSA. The species was not encountered during

Common Name (Scientific Name)	Status Fed/State/ CNPS	Associated Habitats	Potential for Occurrence*
		(Feb-Aug(Sep))	biological surveys of the site.
Silky Cryptantha (<i>Cryptantha crinita</i>)	___/___/1B.2	Cismontane woodland, lower montane coniferous forest, riparian forest and woodland, gravelly streambeds in valley and foothill grassland. (Apr-May)	<u>Low</u> : Sub-marginal habitat is present within the BSA. Species not observed during biological surveys of the site.
Slender-leaved Pondweed (<i>Stuckenia filiformis</i> ssp <i>alpina</i>)	___/___/2B.2	Marshes and swamps (assorted shallow freshwater). (May-July)	<u>None</u> : No suitable marsh habitat present within the BSA.
Tehama navarretia (<i>Navarretia heterandra</i>)	___/___/4.3	Valley and foothill grassland (mesic). Vernal pools	<u>None</u> : Suitable habitat is present within the however, the species was not observed during biological surveys.
Veiny Monardella (<i>Monardella venosa</i>)	___/___/1B.1	Cismontane woodlands. Valley and foothill grasslands in heavy clay soils. (May-July)	<u>Low</u> : Sub-marginal grassland habitat present in the BSA. Additionally, the only known occurrence in Butte County is approximately six miles south of the BSA.
Watershield (<i>Brasenia schreberi</i>)	___/___/2B.3	Freshwater marshes and swamps. (Jun-Sep)	<u>None</u> : No suitable marsh habitat present within the BSA.
White-stemmed Clarkia (<i>Clarkia gracilis</i> ssp. <i>albicaulis</i>)	___/___/1B.2	Chaparral and cismontane woodland (sometimes serpentine). (May-Jul)	<u>None</u> : No suitable chaparral or woodland habitat present within the BSA.
Woolly meadowfoam (<i>Limnanthes floccosa</i> ssp. <i>floccosa</i>)	___/___/4	Edge of vernal pools at elevations of 375 to 400 meters. (Mar-Apr)	<u>Low</u> : Sub-marginal vernal pool habitat present within the BSA. Species not observed during biological surveys of the BSA.
Wooly Rose-mallow (<i>Hibiscus lasiocarpus</i> var. <i>occidentalis</i>)	___/___/1B.2	Marshes and swamps (freshwater). (Jun-Sep)	<u>None</u> : Marginal habitat present within the BSA along the South Fork of Dead Horse Slough. However, the species was not observed during biological surveys of the site.
INVERTEBRATES			
Conservancy Fairy Shrimp (<i>Branchinecta conservatio</i>)	FE/___/___	Moderately turbid, deep, cool-water vernal pool	<u>None</u> : Vernal pools present in the project site are not deep enough to support the species.
Valley Elderberry Longhorn Beetle (<i>Desmocerus californicus dimorphus</i>)	FT/___/___	Blue elderberry shrubs usually associated with riparian areas.	<u>None</u> : No elderberry plants (the sole host plant of this beetle) occur within the BSA.
Vernal Pool Fairy Shrimp (<i>Branchinecta lynchi</i>)	FT/___/___	Vernal pools, swales, and ephemeral freshwater habitat.	<u>High</u> : Vernal pool habitat is suitable for the species and

Common Name (Scientific Name)	Status Fed/State/ CNPS	Associated Habitats	Potential for Occurrence*
			there are occurrences in close proximity to the project site.
Vernal Pool Tadpole Shrimp (<i>Lepidurus packardii</i>)	FE/___/___	Vernal pools, swales, and ephemeral freshwater habitat.	<u>High</u> : Vernal pool habitat within the BSA is suitable for the species and there are occurrences in close proximity to the project site.
REPTILES AND AMPHIBIANS			
California Red-legged Frog (<i>Rana draytonii</i>)	FT/___/___	Inhabits quiet pools of streams, marshes, and occasionally ponds.	<u>None</u> : No suitable ponded habitat present within the BSA. The species is assumed extirpated from the valley floor.
Coast Horned Lizard (<i>Phrynosoma blainvillii</i>)	___/SSC/___	Occurs in openings in valley foothill hardwood, coniferous, riparian habitats, pine-cypress, juniper, and annual grassland habitats with sandy soils and presence of ants.	<u>Low</u> : Sub-marginal grassland habitat present within the BSA.
Foothill Yellow-legged Frog (<i>Rana boylei</i>)	___/SSC/___	Partly-shaded, shallow streams and riffles with cobble-sized substrate for egg-laying.	<u>None</u> : No suitable stream habitat present within the BSA.
Giant Garter Snake (<i>Thamnophis gigas</i>)	FT/ST/___	Agricultural wetlands and other wetlands such as irrigation and drainage canals, low gradient streams, marshes, ponds, sloughs, small lakes, and their associated uplands.	<u>Low</u> : Sub-marginal habitat present in Dead Horse Slough within the BSA.
Northwestern Pond Turtle (<i>Actinemys marmorata marmorata</i>)	___/SSC/___	Associated with permanent ponds, lakes, streams, and irrigation ditches or permanent pools along intermittent streams.	<u>Moderate</u> : Marginal habitat present within the BSA. Suitable habitat present adjacent to the BSA at California Park Lake.
Western Spadefoot (<i>Spea hammondi</i>)	___/SSC/___	Grassland and woodland and vernal pools without aquatic predators for breeding.	<u>Moderate</u> : Marginal grassland habitat present within the BSA, vernal pools present within the BSA.
FISH			
Central Valley Spring-Run Chinook Salmon (<i>Oncorhynchus tshawytscha</i>)	FT/ST/___	Sacramento River and tributaries.	<u>None</u> : No suitable riverine habitat present within the BSA.
Central Valley Steelhead (<i>Oncorhynchus mykiss</i>)	FT/___/___	Sacramento and San Joaquin Rivers and their tributaries.	<u>None</u> : No suitable riverine habitat present within the BSA.
Delta Smelt (<i>Hypomesus transpacificus</i>)	FT/ST/___	Sacramento-San Joaquin Estuary	<u>None</u> : No suitable habitat present in the BSA.
BIRDS			
Bald Eagle (<i>Haliaeetus leucocephalus</i>)	___/SE/___	Lakes, rivers, estuaries, reservoirs and some coastal habitats.	<u>None</u> : No suitable habitat present within the BSA.

Common Name (Scientific Name)	Status Fed/State/ CNPS	Associated Habitats	Potential for Occurrence*
Bank Swallow (<i>Riparia riparia</i>)	___/ST/___	Nests in steep riverbank cliffs, gravel pits, and highway cuts.	<u>None</u> : No suitable riverbank habitat present within the BSA.
Burrowing Owl (<i>Athene cunicularia</i>)	___/SSC/___	Nests in burrows in the ground, often in old ground squirrel burrows or badger, within open dry grassland and desert habitat.	<u>Low</u> : Marginal grassland habitat present within BSA. Species not observed during biological surveys.
California Black Rail (<i>Laterallus jamaicensis coturniculus</i>)	___/ST/___	Yearlong resident of saline, brackish, and fresh emergent wetlands in the San Francisco Bay Area, Sacramento-San Joaquin Delta, coastal Southern California, the Salton Sea and lower Colorado River area.	<u>None</u> : No suitable habitat present within the BSA.
Least Bell's Vireo (<i>Vireo bellii pusillus</i>)	FE/SE/___	Riparian forests, woodlands, scrubs.	<u>None</u> : No suitable riparian habitat present in the BSA.
Loggerhead Shrike (<i>Lanius ludovicianus</i>)	___/SSC/___	Open habitats with sparse shrubs and trees, other suitable perches, bare ground, and low or sparse herbaceous cover	<u>Moderate</u> : Marginal open habitat present within the BSA.
Swainson's Hawk (<i>Buteo swainsoni</i>)	___/ST/___	Nests in isolated trees or riparian woodlands adjacent to suitable foraging habitat including grasslands or suitable grain or alfalfa fields, or livestock pastures.	<u>Moderate</u> : The few trees present in the BSA do not provide suitable nesting habitat for the species; however suitable foraging habitat is present.
Tri-colored Blackbird (<i>Agelaius tricolor</i>)	___/SSC/___	Nests in dense blackberry, cattail, tules, willow, or wild rose within emergent wetlands throughout the Central valley and foothills surrounding the valley.	<u>None</u> : No suitable habitat present within the BSA.
Western Yellow-billed Cuckoo (<i>Coccyzus americanus occidentalis</i>)	FT/SE/___	Structured dense riparian forest, generally willows.	<u>None</u> : No suitable riparian forest habitat present within the BSA.
Yellow Warbler (<i>Setophaga petechia</i>)	___/SSC/___	Very partial to riparian woodlands of the lowlands and foothill canyons.	<u>None</u> : No suitable riparian habitat present within the BSA.
Migratory Birds and Raptors	MBTA	Nest and forage in a variety of habitats including hardwood woodlands, coniferous forests, meadows, grasslands and riparian.	<u>High</u> : Suitable foraging and nesting habitat present.
MAMMALS			
American Badger (<i>Taxidea taxus</i>)	___/SSC/___	Grasslands, savannahs, and mountain meadows with friable soils.	<u>Low</u> : Sub-marginal grassland habitat present within the BSA.
Hoary Bat (<i>Lasiurus cinereus</i>)	__/_/_	Roosting habitat includes woodlands and forests with medium to large-sized trees and dense foliage. Adjacent open areas are required for feeding.	<u>None</u> : No suitable roosting habitat present, open area for foraging present within the BSA.
Pallid Bat (<i>Antrozous pallidus</i>)	___/SSC/___	Arid and semi-arid habitats; roosts in rock crevices, caves, and mine shafts.	<u>None</u> : No suitable roosting habitat present within the BSA.
Silver-haired Bat (<i>Lasionycteris noctivagans</i>)	__/_/_	Coniferous and mixed deciduous forest as well as riparian areas.	<u>None</u> : No suitable deciduous forest habitat

Common Name (Scientific Name)	Status Fed/State/ CNPS	Associated Habitats	Potential for Occurrence*
			present within the BSA.
Western Mastiff Bat (<i>Eumops perotis californicus</i>)	—/SSC/—	Common species of low elevations in California. Crevices in steep cliff faces or in the roof eaves of buildings of two or more stories (needs vertical faces to take flight).	<u>None</u> : No suitable roosting habitat present within the BSA. Foraging habitat present in the BSA.
Western Red Bat (<i>Lasiurus blossevillii</i>)	—/SSC/—	Roosting habitat includes forest and broadleaf woodlands from sea level to coniferous forest. Feeds over grasslands, shrublands, open woodlands, and croplands. Known to occur from Shasta County to the Mexican border – often in riparian habitats.	<u>None</u> : No suitable roosting habitat present within the BSA. Suitable foraging habitat present in the BSA.
Yuma Myotis (<i>Myotis yumanensis</i>)	—/_/_	Woodland and forested areas, large buildings and abandoned mine tunnels within one-half mile of a surface water source; abandoned swallow nests under bridges.	<u>None</u> : No suitable roosting habitat present within the BSA.
CODE DESIGNATIONS			
FE = Federally-listed Endangered FT = Federally-listed Threatened FC = Federal Candidate Species BCC = Federal Bird of Conservation Concern MBTA = protected by the federal Migratory Bird Treaty Act SE = State-listed Endangered ST = State-listed Threatened SH = Presumed extinct in California SSC = CDFW Species of Special Concern FP = CDFW Fully Protected Species SNC = CDFW Sensitive Natural Community CNPS 1B = Rare or Endangered in California or elsewhere CNPS 2 = rare or Endangered in California, more common elsewhere CNPS 3 = More information is needed CNPS 4 = Plants with limited distribution			
<p>*Potential for occurrence: for plants it is considered the potential to occur during the survey period; for birds and bats it is considered the potential to breed, forage, roost, over-winter, or stop-over in the BSA during migration. Any bird or bat species could fly over the BSA, but this is not considered a potential for occurrence. The categories for the potential for occurrence include:</p> <p><u>None</u>: The species or natural community is known not to occur, and has no potential to occur in the BSA based on sufficient surveys, the lack of suitable habitat, and/or the BSA is well outside of the known distribution of the species.</p> <p><u>Low</u>: Potential habitat in the BSA is sub-marginal and the species is not known to occur in the vicinity of the BSA. Protocol-level surveys are not recommended.</p> <p><u>Moderate</u>: Suitable habitat is present in the BSA and the species is known to occur in the vicinity of the BSA.</p> <p><u>High</u>: Habitat in the BSA is highly suitable for the species and there are reliable records close to the BSA, but the species was not observed.</p> <p><u>Known</u>: Species was detected in the BSA or a recent reliable record exists for the BSA.</p>			

Only species with at least moderate potential of occurring within the BSA are discussed in the following section. Species with no or a low potential to occur within the BSA are not discussed further because the potential for these species to occur is negligible.

4.5.1 *Plants*

A majority of the BSA is heavily disturbed grassland. The species composition found on the site is comprised predominately of introduced and invasive grass species, resulting in a lack of suitable habitat for many of the special-status plant species listed in **Table 1**. One special-status species was determined to have the potential to occur on the site. Butte County meadowfoam was determined to have a moderate potential for occurrence within the BSA. No other special-status plant species were determined to have potential to occur within the BSA.

Butte County Meadowfoam

Butte County meadowfoam is a state and federal listed endangered species and critical habitat has been designated by the USFWS. Butte County meadowfoam has been identified exclusively in a narrow 25-mile strip along the eastern edge of the Sacramento Valley from central Butte County to the northern portion of the City of Chico. The winter annual herb belonging to the false meadowfoam family (Limnanthaceae) occurs in shallow soils within vernal swales, along the edges of vernal pools and ephemeral streams, and less frequently around the edges of isolated vernal pools. It has also been observed occurring on uplands immediately adjacent to vernal swales and pools and within abandoned irrigation canals and roadside drainage ditches. Species found in association with BCM are common vernal pool inhabitants including Fremont's tidy tips (*Layia fremontii*), California goldfields (*Lasthenia californica* ssp *californica*), yellow carpet (*Blennosperma nanum*), and coyote thistle (*Eryngium vaseyi*) (Dole and Sun 1992). Butte County meadowfoam is adapted to cross pollination by insects, however, past research has suggested it undergoes substantial amounts of self-pollination. The genetic variation within populations is quite low suggesting very little gene flow between populations. The low genetic variability in association with the large population fluctuations observed in BCM could expose it to increased risks of extinction (Sloop et al. 2010). The nearest known occurrence is located on the south side of SR 32, along the northern property boundary, in a vernal pool within the Caltrans ROW.

The grassland habitat within the BSA provides potentially suitable habitat for BCM, the BSA is adjacent to a few large BCM population centers that occur along the eastern side of the City of Chico. A majority of the BSA is comprised of a soil map unit, Doemill-Jokerst complex 3-8% slopes, that supports BCM populations in the surrounding population centers. However, there is very little mesic habitat present on-site that could support BCM. The South Fork of Dead Horse Slough is likely sub-marginal habitat for BCM as there is little saturated soil that is not completely inundated. The small vernal pools within the parcel boundaries provide potentially suitable habitat for BCM. While BCM has been observed in upland habitat away from vernal pools it is very rare. In addition, the upland habitat within the BSA is heavily invaded with slender oat which would likely exclude BCM from the uplands. Two protocol level surveys for BCM have been conducted on the site, the results of which are discussed in Section 4.7.

4.5.2 *Invertebrates*

Vernal Pool Fairy Shrimp

The vernal pool fairy shrimp (*Branchinecta lynchi*) has known populations extending from Shasta County through the Central Valley to Tulare County. Additionally, the species is found along the central coast, from Solano County to San Benito County. Several disjunct populations exist in San Luis Obispo County, Santa Barbara County, and Riverside County. This geographic range is the widest of any listed vernal pool crustacean however, it is seldomly abundant where found.

The species occupies a variety of different vernal pool habitats including small, clear, sandstone rock pools to large, turbid, alkaline grassland valley floor pools. Although the species has been observed in large vernal pools, it generally occupies smaller pools. It is frequently found in pools smaller than 0.05 acres. These small pools are most commonly found in grass or mud bottomed

swales, or basalt flow depression pools in grasslands. Vernal pool fairy shrimp are typically collected from approximately December to early May.

There is a high potential for the species to occur within the project parcel as the vernal pools present are suitable for the species and there are known occurrences within close proximity.

Vernal Pool Tadpole Shrimp

The vernal pool tadpole shrimp (*Lepidurus packardii*) is found in California from Shasta County to Merced County, a disjunct population can be found in the San Francisco Bay National Wildlife Refuge in Alameda County. They inhabit vernal pools with clear to highly turbid water ranging in size from approximately 50 square feet up to large playa pools such as Olcott Lake at Jepson Prairie.

The species' diet consists of organic debris and living organisms, including fairy shrimp and other invertebrates. Vernal pool tadpole shrimp have a relatively high reproductive rate, and fecundity increases with body size. Large females can deposit as many as six clutches, ranging from 32-61 eggs per clutch. Hatching is temperature dependent, and optimal hatching conditions occur between 10-15 degrees Celsius.

There is a high potential for the species to occur within the project parcel as the vernal pools are suitable for the species and there are known occurrences in close proximity.

4.5.3 *Reptiles and Amphibians*

One special-status reptile species and one special-status amphibian species were determined to have a moderate potential to occur within the BSA including the northwestern pond turtle and western spadefoot. No other special-status reptile or amphibian species were determined to have potential to occur.

Northwestern Pond Turtle

The northwestern pond turtle can be found throughout California and is the only abundant native turtle in California. They are associated with permanent or nearly permanent water in a wide variety of habitats at elevations ranging from near sea level to 4,700 feet. They require basking sites including partially submerged logs, rocks, mats of floating vegetation, or open mud banks. The northwestern pond turtle hibernates in colder areas underwater on muddy bottoms. Nesting sites are typically constructed along the banks of permanent water in soils at least 10 cm deep and must have high internal humidity for eggs to develop and hatch (Jennings and Hayes 1994).

The South Fork of Dead Horse Slough may provide suitable habitat for the species during certain times of the year. Additionally, the upland habitat adjacent to the South Fork of Dead Horse Slough may provide suitable nesting habitat for the species.

Western Spadefoot

The western spadefoot is a State of California Species of Special Concern and its status is currently under review by USFWS, and the species could potentially become listed under the

federal ESA as a threatened or endangered species. It is a relatively small, smooth skinned toad, with white or orange tipped tubercles on its back, and distinctive vertical pupils. It is named for its sharp-edged “spades” on the hind feet that are used for digging.

The species occupies grassland, sage scrub, and woodland habitats from Tehama County to Baja. Adults will forage on insects, worms and other invertebrates. It has been speculated that an adult toad may acquire sufficient energy reserves for their long dormancy period in only a few weeks (Dimmitt and Ruibal 1980). They are dependent upon ephemeral pools or slow-moving water courses for breeding which typically begins in January and lasts to May. 300-500 eggs are laid on plant stems or dead plant material in the bottom of pools and the eggs will usually hatch within three to four days (Stebbins 1985). Larval development will take on average 58 days but can be completed in as little as 30 days if pools begin to dry (Morey 1998).

The western spadefoot is found from Tehama County to San Diego County, typically below 3,000-foot elevation, but has been found as high as 4,500 feet. The biggest threat to the species is loss of habitat and non-native predators (USFWS 2005). The closest extant CNDDDB records occur approximately 1.5 miles northwest of the project site within and near the Sycamore Creek overflow channel.

The vernal pools and section of the South Fork of Dead Horse Slough present within the project parcel could provide potential aquatic breeding habitat. The soils within a majority of the BSA are shallow and may not friable but there may be suitable friable soils adjacent to the South Fork of Dead Horse Slough for western spadefoot estivation. No western spadefoot adults or metamorphs were encountered during biological surveys, nor were there any tadpoles present in the wetted portion of the South Fork of Dead Horse Slough.

4.5.4 *Fish*

No special-status fish species have potential to occur within the BSA due to the lack of suitable stream and riverine habitats present on the site.

4.5.5 *Birds*

The BSA contains potentially suitable habitat for a number of migratory bird species protected by the Migratory Bird Treaty Act (MBTA).

Loggerhead Shrike

The loggerhead shrike is a state species of special concern that can be found in open habitats with scattered shrubs, trees, posts, fences, utility lines or other perches. Typically, they occur in open canopied valley foothill hardwood, valley foothill hardwood-conifer, valley foothill riparian, pinyon-juniper, juniper, desert riparian, and Joshua tree habitats. Loggerhead shrikes are opportunistic predators that primarily eat large insects, but will also take small birds, mammals, amphibians, reptiles, fish, and carrion. Interestingly, loggerhead shrikes will use sharp multi-stemmed plants and barbed wire fences, to impale prey for storage or ease of consumption. Nesting occurs in shrubs or trees at variable heights but generally around 1-2 meters above the ground. Adults lay eggs from March to May with male and females tending young into July or August (Yosef 1996).

The annual grassland habitat within the BSA is suitable for loggerhead shrike. There are numerous perches in the BSA that could be used to scan for prey. Additionally, the small trees and shrubs present in the BSA near Dead Horse Slough could provide suitable nesting substrates.

Swainson's hawk

Swainson's hawk is listed as Threatened under the California Endangered Species Act (CESA). It is a long-distance migrant with nesting grounds in western North America. Swainson's hawks arrive in the Central Valley between March and early April to establish breeding territories. Breeding occurs from late March to late August, peaking in late May through July (Fitzner 1980).

Swainson's hawks nest in isolated trees, small groves, or large woodlands, adjacent to open grasslands or agricultural fields. This species typically nests near riparian areas; however, it has been known to nest in urban areas as well. Nest locations are usually in close proximity to suitable foraging habitats, which include grasslands, fallow fields, irrigated pastures, alfalfa and other hay crops, and low-growing row crops. Swainson's hawks primarily prey upon small rodents such as ground squirrels (*Spermophilis* spp.), pocket gophers (*Thomomys* spp.), voles (*Microtus* spp), but insects, reptiles, and birds may be consumed as well (Snyder and Wiley 1976; Fitzner 1980; Estep 1989). Swainson's hawks leave their breeding grounds to return to their wintering grounds in late August or early September (Bloom and DeWater 1994). Swainson's hawks' largest threats are loss of habitat and secondary poisoning from insecticides on their wintering grounds (Woodbridge et al. 1995a).

The grassland habitat present in the BSA may provide suitable foraging habitat for Swainson's hawk. It should be noted the project parcel is small (less than five acres) and disjunct from the surrounding grassland habitat, it is surrounded by existing urban development to the north and northeast. In addition, the Oak Valley residential subdivision is under construction to the east and south of the project site. The property likely does not support the foraging habitat needed to support the reproductive efforts of a Swainson's hawk pair.

According to the CNDDB the nearest known active nest is located in a walnut orchard south of the Chico State Farm approximately 4.5 miles south, southwest from the project site. An examination of aerial imagery and knowledge of the location suggest this nest is no longer extant. The orchard present in 1998 when the nest was observed no longer exists, as the walnuts have been removed and replaced with non-orchard plantings. The next nearest presumed extant nest is located near the confluence of Big Chico Creek and the Sacramento River off River Road approximately 8.35 miles from the project site. The last recorded observation of this nest was in 1998.

Migratory Bird Species

Migratory birds are protected in varying degrees under California Fish and Game Code, Section 3503.5, the MBTA, and CEQA. The project site currently provides suitable nesting and/or foraging habitat for several of these species that may nest on the ground in the low vegetation present within the BSA. The site also provides a very small amount of riparian vegetation that may be used by birds protected by the MBTA.

4.5.6 *Mammals*

No special-status mammal species have potential to occur within the BSA due to the lack of suitable roosting habitat for bat species.

4.6 Waters of the United States

The types of aquatic resources identified within the BSA are distinguished as Other Waters of the United States (OWOUS) and vernal pools. A previously verified wetland delineation for the Highway 32 Widening project identified several features on the site including two vernal pools totaling approximately 0.018 acres and a section of the South Fork of Dead Horse Slough.

The vernal pools within the project site are designated as Palustrine Emergent Non-Persistent Seasonally Flooded (P-EM-2-C). The survey area contains approximately 0.018 acres of vernal pools.

The South Fork of Dead Horse Slough exhibited an OHWM and contained bed, bank, and/or scour morphology. The South Fork of Dead Horse Slough is a Non-Relatively Permanent Water (NRPW) and designated as Riverine Intermittent Streambed Cobble/gravel (R-4-SB-3). Dead Horse Slough is intermittent because flow is only present during the fall, winter, and early spring months. Within the site, the South Fork of Dead Horse Slough collects sheet flow and conveys it off site and eventually into Little Chico Creek.

No traditional navigable waters (TNW) occur within the survey area. There were no Relatively Permanent Waters (RPW) present on the site, nor were there any Potentially Non-Jurisdictional Features.

The U.S. Army Corps of Engineers SPK number for the verified Delineation of Aquatic Resources Report for the Highway 32 Widening is SPK-2007-01149.

4.7 Previous Surveys

No BCM were encountered during the protocol level surveys conducted on March 22, 2016 and March 28, 2017. Additionally, no BCM was encountered during the survey conducted by NorthStar biologist Matt Rogers on April 26, 2018. No special-status plant species were observed on the property during the surveys. Copies of the BCM protocol level survey reports can be found in **Appendix D**.

5. REGULATORY FRAMEWORK

The following describes federal, state, and local environmental laws and policies that are relevant to the California Environmental Quality Act (CEQA) review process.

5.1 Federal Regulations

5.1.1 Federal Endangered Species Act

The United States Congress passed the federal ESA in 1973 to protect those species that are endangered or threatened with extinction. The ESA is intended to operate in conjunction with the

National Environmental Policy Act (NEPA) to help protect the ecosystems upon which endangered and threatened species depend.

Under the ESA, species may be listed as “endangered,” “threatened,” “candidate,” or “proposed.” An endangered species is in danger of extinction throughout all or a significant portion of its range. A threatened species is likely to become endangered within the foreseeable future throughout all or a significant portion of its range. “Candidate” species are species for which there is enough information to warrant proposing them for listing, but that have not yet been proposed. “Proposed” species are those that have been proposed for listing, but have not yet been listed.

Section 9 of the ESA prohibits the “take” a listed animal without a permit. “Take” is defined to include harassing, harming, pursuing, hunting, shooting, wounding, killing, trapping, capturing, or collecting or any attempt to engage in any such conduct. “Harm” is defined as “an act which actually kills or injures wildlife. Such an act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering.” Under Section 7 of the ESA, federal agencies are required to consult with the USFWS or National Marine Fisheries Service (NMFS) if their actions, including permit approvals or funding, could adversely affect an endangered plant or wildlife species or its habitat, or could adversely affect designated critical habitat. Through consultation and the issuance of a biological opinion, USFWS or NMFS can issue an incidental take statement allowing take of the species, provided the action will not jeopardize the continued existence of any federally listed species or result in the destruction or adverse modification of habitats of those species. Section 10 of the ESA provides for issuance of incidental take permits to private parties without a federal nexus provided a Habitat Conservation Plan (HCP) is developed.

5.1.2 Migratory Bird Treaty Act Title 16 USC Section 703

The federal Migratory Bird Treaty Act (MBTA) (16 USC §703) prohibits the killing of migratory birds or the destruction of their occupied nests and eggs except in accordance with regulations prescribed by the USFWS. The bird species covered by the MBTA includes nearly all of those that breed in North America, excluding introduced (i.e. exotic) species (50 Code of Federal Regulations §10.13).

5.1.3 Clean Water Act Title 33 U.S.C. §1251

5.1.3.1 Section 404 Clean Water Act

The purpose of the Clean Water Act (CWA) is to “restore and maintain the chemical, physical, and biological integrity of the nation’s waters.” Section 404 of the CWA prohibits the discharge of dredged or fill materials into Waters of the United States (WOUS) without a permit from the United States Army Corps of Engineers (USACE). Additionally, Section 401 of the CWA (33 USC 1341) requires any applicant for a federal permit to conduct any activity that may result in the discharge of a pollutant into WOUS, to obtain certification that the discharge will comply with the applicable water quality standards. A Water Quality Certification is required for Section 404 permit actions and they are issued by the Regional Water Quality Control Board (RWQCB).

The term “waters of the United States” is an encompassing term that includes “wetlands” and “other waters.” Wetlands have been defined for regulatory purposes as: “areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions (33 CFR 328.3, 40 CFR 230.3). Wetlands generally include swamps, marshes, bogs, and similar areas.” Other Waters of the United States (OWOUS) are seasonal or perennial water bodies, including lakes, stream channels, drainages, ponds, and other surface water features, that exhibit an ordinary high-water mark but lack positive indicators for one or more of the three wetland parameters (i.e., hydrophytic vegetation, hydric soil, and wetland hydrology) (33 CFR 328.4).

The USACE may issue either individual permits on a case-by-case basis or general permits on a program level. General permits are pre-authorized and are issued to cover similar activities that are expected to cause only minimal adverse environmental effects. Nationwide permits are general permits issued to cover particular fill activities. All nationwide permits have general conditions that must be met for the permits to apply to a particular project, as well as specific conditions that apply to each nationwide permit.

5.1.3.2 Section 401 Clean Water Act

The Clean Water Act (§401) requires water quality certification and authorization for placement of dredged or fill material in wetlands and Other Waters of the United States. In accordance with the Clean Water Act (§401), criteria for allowable discharges into surface waters have been developed by the State Water Resources Control Board (SWRCB), Division of Water Quality. The resulting requirements are used as criteria in granting National Pollutant Discharge Elimination System (NPDES) permits or waivers, which are obtained through the Regional Water Quality Control Board (RWQCB). Any activity or facility that will discharge waste (such as soils from construction) into surface waters, or from which waste may be discharged, must obtain an NPDES permit or waiver from the RWQCB. The RWQCB evaluates an NPDES permit application to determine whether the proposed discharge is consistent with the adopted water quality objectives of the basin plan.

5.2 State Regulations

5.2.1 California Endangered Species Act

The California Endangered Species Act enacted in 1984, is similar to the federal ESA, but pertains to state-listed endangered and threatened species. The CESA requires state agencies to consult with the CDFW when preparing documents to comply with the CEQA. The purpose is to ensure that the actions of the lead agency do not jeopardize the continued existence of a listed species or result in the destruction, or adverse modification of habitat essential to the continued existence of those species. In addition to formal listing under the federal and state endangered species acts, “species of special concern” receive consideration by CDFW. Species of special concern are those whose numbers, reproductive success, or habitat may be threatened.

5.2.2 California Fish and Game Code

5.2.2.1 CFGC Section 3503 and 3503.5

The California Fish and Game Code (CFGC) (§3503) states that “It is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto.” “Take” includes the disturbance of an active nest resulting in the abandonment or loss of young.

Section §3503.5 of the CFGC states that it is “unlawful to take, possess, or destroy any birds in the order Falconiformes or Strigiformes (birds of prey) or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by this code or any regulation pursuant thereto.”

5.2.2.2 CFGC Section 1600

The CDFW is a trustee agency that has jurisdiction under the CFGC (§1600 et seq.). The California Fish and Game Code (§1602), requires that a state or local government agency, public utility, or private entity must notify CDFW if a proposed project will “substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any river, stream, or lake designated by the department, or use any material from the streambeds... except when the department has been notified pursuant to §1601.” If an existing fish or wildlife resource may be substantially adversely affected by the activity, CDFW may propose reasonable measures that will allow protection of those resources. If these measures are agreeable to the parties involved, they may enter into an agreement with CDFW identifying the approved activities and associated mitigation measures.

5.2.2.3 CFGC Section 1900-1913

The California Native Plant Protection Act (CFGC §1900-1913) prohibits the taking, possessing, or sale within the state of any plants with a state designation of rare, threatened, or endangered as defined by CDFW. An exception to this prohibition allows landowners, under specific circumstances, to take listed plant species, provided that the owners first notify CDFW and give the agency at least 10 days to retrieve (and presumably replant) the plants before they are destroyed. Fish and Game Code §1913 exempts from the “take” prohibition “the removal of endangered or rare native plants from a canal, lateral ditch, building site, or road, or other right of way.” Very few of the plants constituting List 3 and List 4 meet the definitions of §1901, Chapter 10 (Native Plant Protection Act) or Sections 2062 and 2067 (California Endangered Species Act) of the California Department of Fish and Game Code, and few, if any, are eligible for state listing. Therefore, List 3 and List 4 plant species are not required to be considered in the preparation of environmental documents relating to CEQA unless they are considered locally or regionally significant.

The CNPS maintains a list of plant species native to California with low population numbers, limited distribution, or otherwise threatened with extinction. This information is published in the Inventory of Rare and Endangered Vascular Plants of California (CNPS 2001). Potential impacts to populations of CNPS-listed plants receive consideration under CEQA review. The CNPS listings categorize plants as follows:

- List 1A: Plants presumed extinct in California;
- List 1B: Plants rare, threatened, or endangered in California or elsewhere;
- List 2: Plants rare, threatened, or endangered in California, but more numerous elsewhere;
- List 3: Plants about which we need more information; and
- List 4: Plants of limited distribution.

5.2.3 *Public Resources Code*

5.2.3.1 *CEQA Guidelines Section 15380*

Although threatened and endangered species are protected by specific federal and state statutes, CEQA Guidelines §15380(d) provides that a species not listed on the federal or state list of protected species may be considered rare or endangered if the species can be shown to meet certain specified criteria. These criteria have been modeled based on the definition in the ESA and the section of the CFGC dealing with rare, threatened, and endangered plants and animals. The CEQA Guidelines (§15380) allows a public agency to undertake a review to determine if a significant effect on species that have not yet been listed by either the USFWS or CDFW (e.g. candidate species, species of concern) would occur. Thus, CEQA provides a lead agency with the ability to protect a species from a project’s potential impacts until the respective government agencies have an opportunity to designate the species as protected, if warranted.

5.2.3.1 *Oak Woodlands Section 21083.4*

As part of the determination made by a County as to whether a project is required to prepare an environmental impact report or negative declaration, “A county shall determine whether a project within its jurisdiction may result in a conversion of oak woodlands that will have a significant effect on the environment” (Public Resources Code (PRC) Section 21083.4(b)). If a county determines that there may be a significant effect to oak woodlands, the county shall require mitigation as identified in PRC Section 21083.4(b).

5.3 **Local Regulations**

5.3.1 *Chico Municipal Code*

5.3.1.1 *Chico Municipal Code Section 16.66*

The intent of the municipal code regarding tree preservation is to establish regulations controlling the removal of and preservation of trees within the city. The code establishes species requiring a permit for removal and the processes regarding the permit application, review, permit issuance, and a variety of additional provisions.

6. CONCLUSIONS AND RECOMMENDATIONS

6.1 Butte County Meadowfoam

The BSA contains potentially suitable habitat for BCM and the site is directly adjacent to three large population centers for the species. However, two protocol level surveys have been completed for the site with negative results for the presence of BCM.

6.2 Vernal Pool Crustaceans

The vernal pools present within the project parcel would be impacted by project construction. The vernal pools onsite provide suitable habitat for federally listed vernal pool fairy shrimp and vernal pool tadpole shrimp. Protocol-level species surveys should be conducted prior to any construction activities to determine presence or absence of listed vernal pool crustaceans. In the absence of protocol-level surveys, presence of invertebrates will be assumed, in which case mitigation per USFWS requirements must be completed for any impacts, direct or indirect, to vernal pools within the BSA and Section 7 consultation will most likely be required.

6.3 Northwestern Pond Turtle

Northwestern pond turtles could potentially occur within the BSA and it will be up to the CEQA lead agency (i.e. City of Chico) to determine if mitigation will be required to be considered during the planning process. If the pond turtle's status were upgraded to a candidate, threatened or endangered status at any time during the construction process, protocol-level surveys and mitigation would likely be required. In addition, care should be taken during construction activities not to disturb nesting and basking turtles.

6.4 Western Spadefoot

Western spadefoot toads could potentially occur within the BSA and it will be up to the CEQA lead agency (i.e. City of Chico) to determine if mitigation will be required to be considered during the planning process. If western spadefoot's status were to upgrade to a candidate, threatened, or endangered status at any time during the construction process, protocol-level surveys and mitigation would likely be required. In addition, care should be taken during construction activities not to disturb western spadefoot toads.

6.5 Swainson's Hawk

Prior to future development of the site, which would include permanent impacts to Swainson's hawk foraging habitat, the purchase of compensatory mitigation will be necessary per the 1994 CDFW *Staff Report regarding Mitigation for Impacts to Swainson's Hawks (Buteo swainsoni) in the Central Valley of California* at a ratio of 0.5:1 (0.5 acre preserved for every 1 acre of habitat affected). The development project proponent will have to purchase credits or preserve Swainson's hawk foraging habitat.

6.6 Loggerhead Shrike, Migratory Birds, and Nesting Raptors

Vegetation removal or ground disturbance in areas where nests of birds protected by the MBTA (16 USC §703) and the CFGC (§3503) potentially occur, should be conducted between September 1 and February 28 (i.e. the non-breeding season). If vegetation removal or ground disturbance occurs during the breeding season (i.e. March 1 to August 31) then a qualified biologist shall:

- Conduct a survey for raptors and all other birds protected by the MBTA and map all nests located within 500 feet of construction areas;
- Develop buffer zones around active nests that are sufficient enough in size to ensure impacts to nesting species are avoided.

6.7 Waters of the United States

If impacts to any of the WOUS delineated within the BSA are proposed, a CWA Section 404 permit from the USACE and a CWA Section 401 Water Quality Certification from the RWQCB will need to be obtained prior to any construction activities.

- Work area boundaries will be flagged or fenced in order to prevent accidental impact to adjacent WOUS.

6.8 Tree Removal

The trees that would be removed as a result of subsequent development are exempt from the City of Chico's Municipal Code Chapter 16.66 Tree Preservation Regulations.

7. REFERENCES

- Baldwin, B.G., D.H. Goldman, D.J. Keil, R. Patterson, T.J. Rosatti, and D.H. Wilken, editors. 2012. *The Jepson Manual: Vascular Plants of California, Second Edition*. University of California Press, Berkeley.
- Bloom, P.H. and D. Van DeWater. 1994. Swainson's hawk. *In*: C.G. Thelander and M. Crabtree, editors. *Life on the Edge: A Guide to California's Endangered Natural Resources: Wildlife*. BioSystems Books, Santa Cruz, CA. pp. 150-151.
- CDFG. 1994. Staff Report regarding Mitigation for Impacts to Swainson's Hawks (*Buteo swainsoni*) in the Central Valley of California. Sacramento, CA.
- CDFG. 1983. Guidelines for Assessing the Effects of Proposed Projects on Rare, Threatened, and Endangered Plants and Natural Communities. California Department of Fish and Game. Sacramento, CA. Revised May 2000.
- CNDDDB. 2016. California Department of Fish and Wildlife. Biogeographic Data Branch. California Natural Diversity Database. RareFind v. 5.1.1
- CNPS. Rare Plant Program. 2016. Inventory of Rare and Endangered Plants (online edition, v8-02). California Native Plant Society, Sacramento, CA. Website. <http://www.rareplants.cnps.org>
- CNPS Rare Plant Scientific Advisory Committee. February 1991 (Revised April 1998). Mitigation Guidelines Regarding Impacts to Rare, Threatened, and Endangered Plants. California Native Plant Society. Sacramento, CA.
- California Office of Planning and Research and Office of Permit Assistance. 1986. CEQA: California Environmental Quality Act Statutes and Guidelines. Sacramento, CA. Revised 1999.
- California Wildlife Habitats Relationships System. http://www.dfg.ca.gov/biogeodata/cwhr/wildlife_habitats.asp
- Dimmitt, M.A., and R. Ruibal. 1980. Exploitation of food resources by spadefoot toads (*Scaphiopus*). *Copeia* 1980(4):854-862.
- Dole, J.A., and M. Sun. 1992. Field and genetic survey of the endangered Butte County meadowfoam-*Limnanthes floccosa* subsp. *californica*. (Limnanthaceae). *Conservation Biology* 6:549-558.
- Estep, J. A. 1989. Biology, movements, and habitat relationships of the Swainson's Hawk in the Central Valley of California, 1986-87. Calif. Dept. Fish and Game, Nongame Bird and Mammal Sec. Rep., 52pp

- Fiztner, R.E. 1980. Behavioral ecology of the Swainson's hawk (*Buteo swainsoni*) in southeastern Washington. Pac. NW Lab PLN-2754.
- Hansen, G.E. 1988. Review of the Status of the Giant Garter Snake (*Thamnophis couchi gigas*) and its Supporting Habitat during 1986-1987. Final Report for California Department of Fish and Game, Contract C-2060.
- Hansen, R.W. and G.E. Hansen. 1990. *Thamnophis gigas* (giant garter snake) reproduction. Herpetological Review. 21(4): 93-94.
- Holland, R.F. 1986 Preliminary Descriptions of the Terrestrial Natural Communities of California. State of California, The Resources Agency, Nongame Heritage Program, Dept. of Fish and Game, Sacramento, CA
- Jennings, M. R. and M. P. Hayes. 1994. Amphibian and reptile species of special concern in California. California Department of Fish and Game. Rancho Cordova. 255 pp.
- Mayer, K.E. and W.F. Laudenslayer. 1988. A Guide to Wildlife Habitats of California. California Department of Forestry and Fire Protection. Sacramento, CA.
- Morey, S. 1998. Pool duration influences age and body mass at metamorphosis in the western spadefoot toad: implications for vernal pool conservation. In Witham, C.W. (ed), *Ecology, conservation, and management of vernal pool ecosystems*. Sacramento, CA: CNPS.
- NRCS. 2006. Soil Survey of Butte Area, California, Parts of Butte and Plumas Counties. Natural Resources Conservation Service.
- Sawyer, J.O., Keeler-Wolf, T. and J.M. Evans. 2008. A Manual of California Vegetation. Second Edition. California Native Plant Society. Sacramento, CA.
- Skinner, M. and B. Pavlik. 2001. Inventory of rare and endangered vascular plants of California, 5th edition. California Native Plant Society. Sacramento, CA.
- Sloop, C.M., et al. 2011. Conservation genetics of Butte County meadowfoam (*Limnanthes floccosa* ssp. *californica* Arroyo), an endangered vernal pool endemic. Conservation Genetics. 12(1): 311-323.
- Snyder, N. F. R. and J. W. Wiley. 1976. Sexual Size Dimorphism in Hawks and Owls of North America. Ornithological Monograph No. 20.
- Stebbins, R.C. 1985. A field guide to western reptiles and amphibians. Second edition, revised. Houghton Mifflin Co. Boston, Massachusetts.
- USACE. 2016. *Minimum Standards for Acceptance of Aquatic Resources Delineation Reports*.

- USACE. 2008. *Regional Supplement to the Corps of Engineers Wetland Delineation manual. Arid West Region (Version 2.0).*
- USACE. 2007. *U.S. Army Corps of Engineers Jurisdictional Determination Form Instructional Guidebook.*
- USACE. 1987. *United States Army Corps of Engineers Wetlands Delineation Manual.*
- USFWS. 2016. Information for Planning and Conservation. Environmental Conservation Online System. Website <http://ecos.fws.gov/ipac>
- USFWS. 2006. Giant Garter Snake (*Thamnophis gigas*) 5-Year Review: Summary and Evaluation. Sacramento, CA.
- USFWS. 2005. Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon. Portland OR. Xxii+ 574pp.
- USFWS. 1997. Programmatic Formal Consultation for U.S. Army Corps of Engineers 404 Permitted Projects with Relatively Small Effects on the Giant Garter Snake within Butte, Colusa, Glenn, Fresno, Merced, Sacramento, San Joaquin, Solano, Stanislaus, Sutter and Yolo Counties, California.
- USFWS. 1979. *Classification of Wetlands and Deepwater Habitats of the United States.*
- Woodbridge, B, K. K. Finley, and T. S. Seager. 1995. An investigation of the Swainson's hawk in Argentina. *J. Raptor Res.*29(3):202-204
- Yosef, R. 1996. Loggerhead Shrike (*Lanius ludovicianus*). *The Birds of North America Online* (A. Poole, Ed). Ithaca. Cornell Lab of Ornithology.

Appendix A
USFWS Species List

Appendix B
CNDDDB Species List

Appendix C
CNPS Species List

Appendix D

Species Observed in the BSA by NorthStar Biologists.

Plants	
Scientific Name	Common Name
<i>Aira caryophylla</i>	Common silver-hair grass
<i>Amsinckia intermedia</i>	Common fiddleneck
<i>Avena barbata</i>	Wild oat
<i>Baccharis salicifolia</i>	Mule fat
<i>Brassica rapa</i>	Field mustard
<i>Bromus hordeaceus</i>	Soft brome
<i>Bromus madritensis</i>	Foxtail chess
<i>Calandrinia ciliate</i>	Red maids
<i>Callitriche heterophylla</i>	Great water-starwort
<i>Centaurea solstitialis</i>	Yellow star thistle
<i>Centromadia fitchii</i>	Spikeweed
<i>Chlorogalum pomeridianum</i>	Soap plant
<i>Delphinium variegatum</i>	Royal larkspur
<i>Eleocharis macrostachya</i>	Pale spike rush
<i>Elymus caput-medusae</i>	Medusa head
<i>Epilobium brachycarpum</i>	Stork's bill
<i>Eriogonum nudum var. pubiflorum</i>	Fremont's wild buckwheat
<i>Erodium botrys</i>	Long-beak storks-bill
<i>Erodium cicutarium</i>	Redstem filaree
<i>Festuca myuros</i>	Rat-tail six-weeks grass
<i>Festuca perennis</i>	Perennial rye grass
<i>Gallium aparine</i>	Cleavers
<i>Geranium dissectum</i>	Cut-leaf geranium
<i>Clyceria declinate</i>	Waxy manna grass
<i>Hordeum marinum ssp. gussoneanum</i>	Mediterranean barley
<i>Hordeum murinum ssp. leporinum</i>	Wall barley
<i>Juncus bufonius</i>	Toad rush
<i>Lamium amplexicaule</i>	Henbit
<i>Lasthenia fremontii</i>	Fremont's goldfields
<i>Logfia filaginoides</i>	California cottonrose
<i>Lupinus bicolor</i>	Bicolored lupine
<i>Lupinus pachylobus</i>	Big pod lupine
<i>Marsilea vestita ssp. vestita</i>	Hairy water clover

<i>Minuartia californica</i>	California sandwort
<i>Navarretia intertexta</i>	Needle leaved navarretia
<i>Navarretia leucocephala</i>	White-flower pincushion-plant
<i>Plagiobothrys canescens</i>	Valley popcorn flower
<i>Plagiobothrys greenei</i>	Greene's popcorn flower
<i>Plagiobothrys nothofulvus</i>	Foothill snowdrops
<i>Plagiobothrys stipitatus</i>	Stalked popcorn flower
<i>Plantago erecta</i>	Erect plantain
<i>Poa annua</i>	Annual blue grass
<i>Rumex crispus</i>	Curly dock
<i>Senecio vulgaris</i>	Common groundsel
<i>Sherardia arvensis</i>	Field madder
<i>Sidalcea calycosa</i>	Vernal pool checkerbloom
<i>Silyburn marianum</i>	Milk thistle
<i>Stellaria media</i>	Common chickweed
<i>Torilis arvensis</i>	Hedge parsley
<i>Triphysaria eriantha</i>	Butter-and-eggs
<i>Trichostema lanceolatum</i>	Vinegar weed
<i>Veronica peregrine</i>	Neckweed
<i>Vicia villosa</i>	Winter vetch
<i>Zeltnera venusta</i>	California centaury
Wildlife	
Scientific Name	Common Name
Birds	
<i>Aphelocoma californica</i>	California scrub-jay
<i>Agelaius phoeniceus</i>	Red-winged black bird
<i>Anas platyrhynchos</i>	Mallard
<i>Buteo lineatus</i>	Red shouldered hawk
<i>Cathartes aura</i>	Turkey vulture
<i>Charadrius vociferus</i>	Killdeer
<i>Columba livia</i>	Rock pigeon
<i>Euphagus cyanocephalus</i>	Brewer's blackbird
<i>Haemornous mexicanus</i>	House finch
<i>Mimus plyglottos</i>	Northern mockingbird
<i>Passerculus snadwichensis</i>	Savannah sparrow
<i>Petrochelidon pyrrhonota</i>	Cliff swallow
<i>Quiscalus mexicanus</i>	Great-tailed grackle
<i>Spinus psaltria</i>	Lesser goldfinch

<i>Spinus tristis</i>	American goldfinch
<i>Stelgidopteryx serripennis</i>	Northern roughwinged swallow
<i>Streptopellia decaocto</i>	Eurasian collared dove
<i>Sturnella neglecta</i>	Western meadowlark
<i>Tachycineta bicolor</i>	Tree swallow
<i>Tyrannus verticalis</i>	Western kingbird
<i>Zenaida macroura</i>	Mourning dove
<i>Pterochelidon pyrrhonota</i>	Cliff swallow
Reptiles and Amphibians	
<i>Anaxyrus boreas</i>	Western toad
<i>Pseudacris sierra</i>	Sierran treefrog
<i>Sceloporus occidentalis</i>	Western fence lizard
<i>Thamnophis sirtalis</i>	Common garter snake

Appendix E
Butte County Meadowfoam Survey Reports