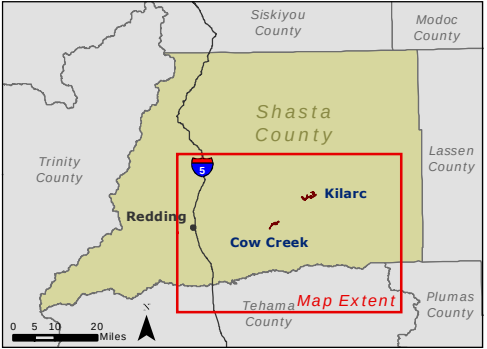
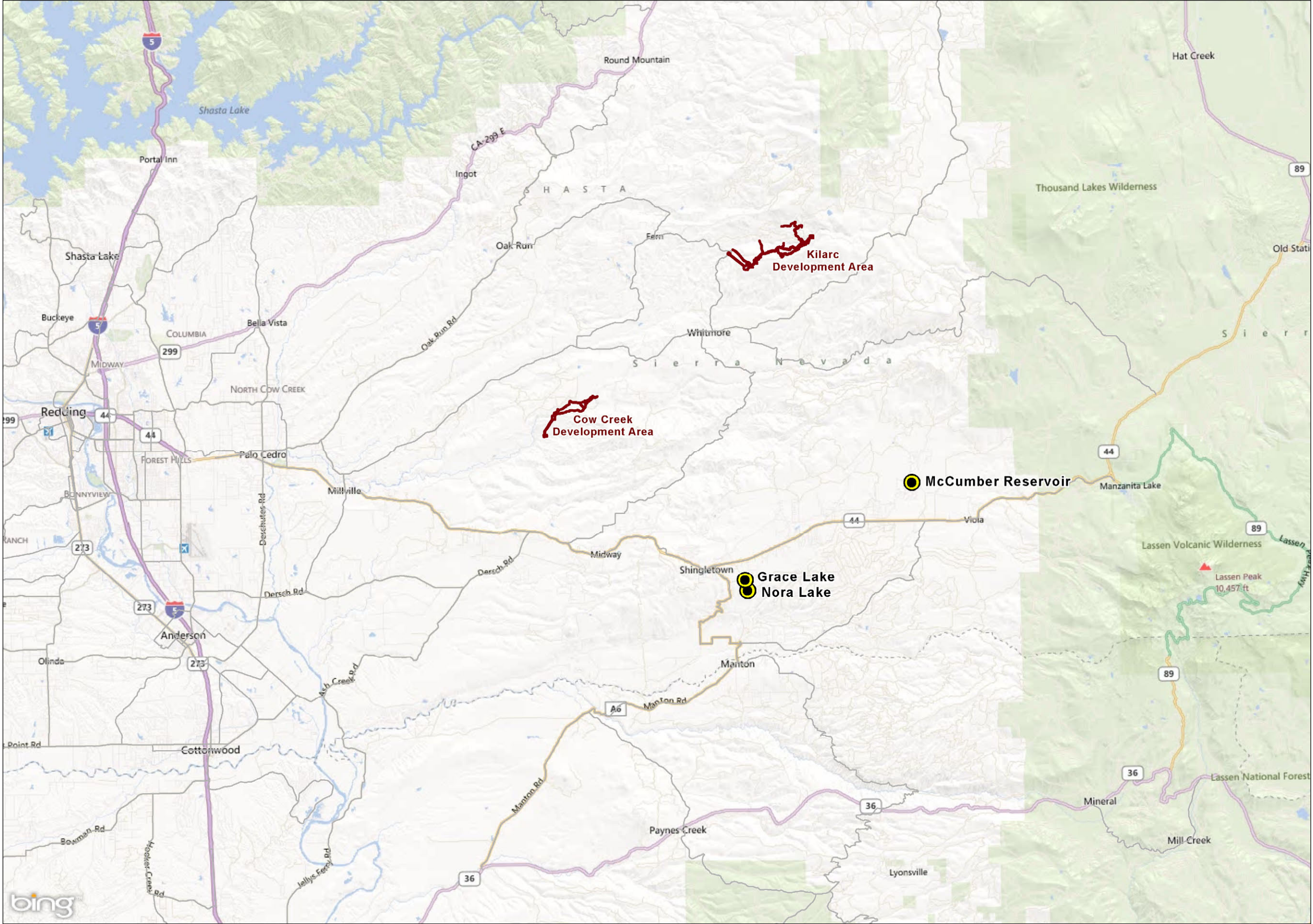


APPENDIX E

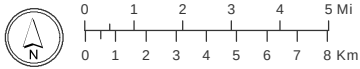
Biological Species Lists

2014



Visited Site

FERC Boundary



Pacific Gas & Electric Company
KILARC-COW CREEK HYDROELECTRIC PROJECT

Appendix F, Figure 1
Study Area for
Accessibility Assessment

Appendix E-1: Special-Status Wildlife Species Potentially Present in the Project Area

Species	Federal Status	State Status	Habitat Affiliation	Potential Occurrence
Invertebrates				
Valley elderberry longhorn beetle <i>Desmocerus californicus dimorphus</i>	FT	—	Elderberry shrubs throughout the Central Valley and foothills below 3,000 feet in elevation.	May occur. Appropriate habitat is present in elderberry shrubs within the Project Area. Two shrubs are located near the South Cow Creek Canal. There are no known occurrences within a 5-mile radius of the Project Area. No VELB were detected during 2003 focused surveys.
Vernal pool fairy shrimp <i>Branchinecta lynchi</i>	FT	—	Central Valley vernal pools, swales, slumps, and basalt flow depressions, up to 950 feet in elevation.	Unlikely to occur due to lack of suitable habitat. There are no known occurrences within a 5-mile radius of the Project Area.
California linderiella fairy shrimp <i>Linderiella occidentalis</i>	—	—	Central Valley vernal pools, swales, slumps, and basalt flow depressions.	Unlikely to occur due to lack of suitable habitat. There are no known occurrences within a 5-mile radius of the Project Area.
Vernal pool tadpole shrimp <i>Lepidurus packardii</i>	FE	—	Central Valley vernal pools, swales, slumps, and basalt flow depressions, ranging from east of Redding in Shasta County south to the San Luis National Wildlife Refuge in Merced County.	Unlikely to occur due to lack of suitable habitat. There are no known occurrences within a 5-mile radius of the Project Area.
Shasta crayfish <i>Pacifastacus forti</i>	FE	SE	Occurs only in Shasta County within the Pit River drainage system, generally in cool, spring-fed headwaters characterized by clean, volcanic cobbles and boulders overlying sand or gravel substrates.	Unlikely to occur in the Project Area. Project Area located outside of species' documented distribution. There are no known occurrences within a 5-mile radius of the Project Area.

Appendix E-1: Special-Status Wildlife Species Potentially Present in the Project Area

Species	Federal Status	State Status	Habitat Affiliation	Potential Occurrence
Amphibians				
Shasta salamander <i>Hydromantes shastae</i>	—	ST	Uncommon in limestone areas in the vicinity of Shasta Reservoir in Shasta County. Numerous small, isolated populations occurring in limestone areas in valley-foothill, hardwood-conifer, ponderosa pine and mixed conifer habitats from 1,100 to 2,550 feet.	Unlikely to occur in the Project Area. Project Area located outside of species' documented distribution. There are no known occurrences within a 5-mile radius of the Project Area.
Western spadefoot toad <i>Scaphiopus hammondi</i>	—	CSC	Requires vernal pools and seasonal wetlands below 4,500 feet that lack predators for breeding. Also occurs in grassland habitat and occasionally in valley-foothill oak woodlands and orchards.	Unlikely to occur due to lack of suitable habitat. There are no known occurrences within a 5-mile radius of the Project Area.
California red-legged frog <i>Rana aurora draytonii</i>	FT	CSC	Breeds in quiet streams and permanent, deep, cool ponds with overhanging and emergent vegetation below 4,000 feet elevation. Known to occur adjacent to breeding habitats in riparian areas and heavily vegetated streamside shorelines, and in non-native grasslands.	May occur. No appropriate spawning habitat was found in the Project Area during the Site Assessment, but several ponds on private land within the Site Assessment Area may be suitable. Potential summer habitat exists along Hooten Gulch within 100 meters of its confluence with South Cow Creek. There are no known occurrences within a 5-mile radius of the Project Area. Not detected during amphibian surveys

Appendix E-1: Special-Status Wildlife Species Potentially Present in the Project Area

Species	Federal Status	State Status	Habitat Affiliation	Potential Occurrence
Foothill yellow-legged frog <i>Rana boylei</i>	—	CSC	Breeds in rocky streams with cool, clear water in a variety of habitats, including valley and foothill oak woodland, riparian forest, ponderosa pine, mixed conifer, coastal scrub, mixed chaparral, and wet meadows; occurs at elevations ranging from 0 to 6,000 feet.	Known to occur. There is a CNDDB record for this species on Old Cow Creek (CDFG 2003). This species was detected in South Cow Creek and Hooten Gulch during 2003 reconnaissance wildlife surveys and focused foothill yellow-legged frog surveys.
Western tailed frog <i>Ascaphus truei</i>	—	CSC	Coastal Mendocino County north to the Oregon border with a disjunct population in the Shasta region. Occurs in permanent streams with low temperatures, with steep canyon walls, in conifer and hardwood-conifer habitats from 0 to 6,500 feet.	Unlikely to occur in the Project Area. Project Area located outside of species' documented distribution. There are no known occurrences within a 5-mile radius of the Project Area.
Reptiles				
Northwestern pond turtle <i>Actinemys marmorata marmorata</i>	—	CSC	Perennial wetlands and slow moving creeks and ponds with overhanging vegetation up to 6,000 feet; suitable basking sites such as logs and rocks above the waterline.	Known to occur. There is one CNDDB occurrence approximately 2 miles from the Project Area (CDFG 2003). Detected incidentally in Hooten Gulch and near the Cow Creek Powerhouse during surveys.
California horned lizard <i>Phrynosoma coronatum frontale</i>	—	CSC	Exposed sandy-gravelly substrate with scattered shrubs, clearings in riparian woodlands, and annual grasslands. Ranges in the Central Valley from southern Tehama County south; in the Sierra foothills from Butte County to Tulare County below 4,000 feet; ranging from sea level to 4,000 feet in the Sierra foothills.	Unlikely to occur in the Project Area. Project Area located outside of species' documented distribution. There are no known occurrences within a 5-mile radius of the Project Area.

Appendix E-1: Special-Status Wildlife Species Potentially Present in the Project Area

Species	Federal Status	State Status	Habitat Affiliation	Potential Occurrence
Birds				
White-faced ibis <i>Plegadis chihi</i>	—	CSC	Uncommon summer resident in sections of Southern California, rare visitor in the Central Valley. Nests in dense, fresh emergent wetland. Forages in shallow water or muddy fields.	Unlikely to occur in the Project Area. Project Area is not within species' documented distribution. There are no known occurrences within a 5-mile radius of the Project Area.
Aleutian Canada goose <i>Branta canadensis leucopareia</i>	FD 2001	SA	Occurs in pastures and grain fields in the Central Valley.	Unlikely to occur in the Project Area due to lack of suitable habitat. There are no known occurrences within a 5-mile radius of the Project Area.
Osprey <i>Pandion haliaetus</i>	—	CSC	Associated strictly with large, fish-bearing waters, primarily in ponderosa pine through mixed conifer habitats. Known to breed near Shasta Lake.	Known to occur. Not detected during focused surveys. Detected incidentally at Kilarc Forebay during other surveys for the Project. There are no CNDDDB occurrences of this species within a 5-mile radius of the Project Area.
White-tailed kite <i>Elanus leucurus</i>	—	CFP	Coastal and valley lowlands. Herbaceous and open stages of most habitats; grasslands and agricultural areas are used for foraging; typically nests in tops of dense oak, willow, or other tree stands adjacent to open areas and agricultural fields.	May occur. Appropriate breeding and foraging habitat is present in South Cow Creek. There are no known occurrences within a 5-mile radius of the Project Area.

Appendix E-1: Special-Status Wildlife Species Potentially Present in the Project Area

Species	Federal Status	State Status	Habitat Affiliation	Potential Occurrence
Bald eagle <i>Haliaeetus leucocephalus</i>	Delisted (2007)	SE, CFP	Year-round in Shasta County. Occurs in low to mid-range elevations of the Sierra Nevada. Nests in large, old-growth or dominant live tree with open branches. Perches in large trees, snags or broken-topped trees near water for foraging.	Known to occur. Have been observed roosting and foraging at the Kilarc Forebay (PG&E, pers. com.). Not observed during focused surveys. There are no CNDDDB records within a 5-mile radius of the Project Area.
Sharp-shinned Hawk <i>Accipiter striatus</i>	—	CSC	Mid-elevation habitats. Roosts in intermediate to high-canopy forest. Nests in dense, even-aged, single-layered forest canopy. Winters in woodlands. Prefers, but not restricted to, riparian habitats. All habitats except alpine, open prairie, and bare desert used in winter.	May forage in riparian habitat or nest in mixed conifer forest in the Project Area. There are no known occurrences within a 5-mile radius of the Project Area.
Northern Goshawk <i>Accipiter gentilis</i>	—	CSC	Prefers middle to high elevation, mature, dense conifer forests for foraging and nesting. Casual in foothills during winter, northern deserts in pinyon-juniper woodland, and low elevation riparian habitats. Nests on north-facing slopes near water.	May forage in riparian, oak woodland, or mixed conifer habitat and may also breed in forest habitats in the Project Area. There is one CNDDDB record approximately 5 miles from the Project Area (CDFG 2003).
Swainson's Hawk <i>Buteo swainsoni</i>	—	ST	Breeding resident and migrant in the Central Valley, Klamath Basin, Northeastern Plateau, Lassen County, and Mojave Desert. Requires large, open grasslands with abundant prey in association with suitable nest trees. Nests in mature riparian forest, groves of oaks, and mature roadside trees.	May occur. Appropriate habitat is present in the grassland (foraging) and woodland (nesting) habitats of the Project Area, particularly in the southern portion of the South Cow Creek Project vicinity. There are no known occurrences within a 5-mile radius of the Project Area.

Appendix E-1: Special-Status Wildlife Species Potentially Present in the Project Area

Species	Federal Status	State Status	Habitat Affiliation	Potential Occurrence
Ferruginous hawk <i>Buteo regalis</i>	—	CSC	Forages in grasslands, sagebrush flats, desert scrub, low foothills, and pinyon-juniper in the Modoc Plateau, Central Valley, and Coast Ranges; breeds in the Great Basin and northern plains states.	Unlikely to occur in the Project Area. Project Area is not within species' documented distribution. There are no known occurrences within a 5-mile radius of the Project Area.
Golden eagle <i>Aquila chrysaetos</i>	—	CSC, CFP	Habitat is typically rolling foothills, mountain areas, sage juniper flats, grasslands, and early successional forest.	Known to occur. Detected incidentally during surveys near the Cow Creek Forebay. May nest or forage in grasslands, oak woodland, or mixed conifer forest in the Project Area. There are no CNDDDB occurrences within a 5-mile radius of the Project Area.
American peregrine falcon <i>Falco peregrinus americana</i>	FD 1999	SE, CFP	Breeds near wetlands, lakes, and rivers on high cliffs and banks.	Known to occur. Documented nesting in the Cow Creek watershed (Watershed Assessment 2001). May forage in or near Kilarc or Cow Creek Forebays and in stream habitat in Project Area. This species was not detected during 2003 focused surveys, and there are no CNDDDB records within a 5-mile radius of the Project Area.
Long-billed curlew <i>Numenius americanus</i>	—	CSC	Found in wet meadow habitat in northeastern California in Siskiyou, Modoc, and Lassen counties. Winter visitor along the California coast and in the Central and Imperial valleys.	Unlikely to occur in the Project Area. Project Area is not within species' documented distribution. There are no known occurrences within a 5-mile radius of the Project Area.

Appendix E-1: Special-Status Wildlife Species Potentially Present in the Project Area

Species	Federal Status	State Status	Habitat Affiliation	Potential Occurrence
Western yellow-billed cuckoo <i>Coccyzus americanus occidentalis</i>	FC	SE	Valley foothill and desert riparian habitats in scattered locations in California; breeds along the Colorado River, Sacramento and Owens valleys, South Fork of the Kern River, Santa Ana River, and the Amargosa River.	Unlikely to occur in the Project Area. Project Area is not within species' documented distribution. There are no known occurrences within a 5-mile radius of the Project Area.
Flammulated owl <i>Otus flammeolus</i>	—	SA	Occurs in the North Coast and Klamath ranges, Sierra Nevada Mountains, and in mountains in southern California in a variety of conifer habitats from 6,000 to 10,000 feet.	Unlikely to occur in the Project Area. Project Area is not within documented species' elevational range. There are no known occurrences within a 5-mile radius of the Project Area.
Western burrowing owl <i>Athene cunicularia hypugaea</i>	—	CSC	Grasslands, oak woodlands, and ponderosa pine habitat, up to 5,300 feet.	May occur. Appropriate breeding and foraging habitat is present within grasslands in the Project Area. There are no known occurrences within a 5-mile radius of the Project Area.
Northern spotted owl <i>Strix occidentalis caurina</i>	FT	—	Occurs in dense, old-growth, multi-layered mixed conifer, redwood, and Douglas fir habitats, from sea level up to 7,600 feet.	May occur. Appropriate breeding and foraging habitat is present in mixed conifer within the Project Area. There are no known occurrences within a 5-mile radius of the Project Area.

Appendix E-1: Special-Status Wildlife Species Potentially Present in the Project Area

Species	Federal Status	State Status	Habitat Affiliation	Potential Occurrence
Short-eared owl <i>Asio flammeus</i>	—	CSC	Occurs in the Central Valley and western Sierra foothills in open areas with few trees, such as annual and perennial grasslands, prairies, dunes, meadows, irrigated lands, and saline and fresh emergent wetlands. This species occurs only along the northeast edge of Shasta County.	Unlikely to occur in the Project Area. Project Area is not within species' documented distribution. There are no known occurrences within a 5-mile radius of the Project Area.
Black swift <i>Cypseloides niger</i>	—	CSC	Breeds very locally in the Sierra Nevada and Cascade ranges. Nests in moist crevices or caves, or on cliffs near waterfalls in deep canyons. Forages widely over many habitats; seems to avoid arid regions.	Unlikely to occur in the Project Area. Project Area is not within species' documented distribution. There are no known occurrences within a 5-mile radius of the Project Area.
Vaux's swift <i>Chaetura vauxi</i>	—	CSC	Prefers redwood and Douglas fir habitats with nest sites in large, hollow trees and snags, especially tall, burned-out stubs. Forages over moist terrain and habitats, preferring rivers and lakes. Summer resident of northern California.	May forage and breed in mixed conifer forest near streams and forebays in the Project Area. There are no known occurrences within a 5-mile radius of the Project Area.
Rufous hummingbird <i>Selasphorus rufus</i>	—	SA	Prefers redwood and Douglas fir habitats. Breeds in the Coastal Range north of Sonoma County, Sierra Nevada Mountains, and possibly in the Cascade Range. Fairly common migrant throughout most of California in April to May and August to September.	May breed or forage in mixed conifer within the Project Area. There are no known occurrences within a 5-mile radius of the Project Area.

Appendix E-1: Special-Status Wildlife Species Potentially Present in the Project Area

Species	Federal Status	State Status	Habitat Affiliation	Potential Occurrence
Little willow flycatcher <i>Empidonax traillii brewsteri</i>	—	SE (nesting; all subspecies)	Occurs in broad, open river valleys or large mountain meadows with lush growth of shrubby willows, wet meadow and montane riparian habitats from 2,000 to 8,000 feet. Breeding seldom occurs below 5,000 feet.	May forage in riparian habitat and may breed within reaches of South Cow Creek in the Project Area. There are no known occurrences within a 5-mile radius of the Project Area.
Loggerhead shrike <i>Lanius ludovicianus</i>	—	CSC	Open habitats with sparse shrubs and trees (or other suitable perch sites) and bare ground and/or low, sparse herbaceous cover; oak woodlands for nesting. Found in lowlands and foothills throughout California.	May forage in oak woodlands or riparian habitat in the Project Area. May breed in oak woodlands in the Project Area. There are no known occurrences within a 5-mile radius of the Project Area.
Bank swallow <i>Riparia riparia</i>	—	ST	Migrant found primarily in riparian and other lowland habitats in California west of the deserts. Requires vertical banks and cliffs with fine-textured or sandy soils near streams, rivers, ponds, lakes, or the ocean for nesting.	Unlikely to occur in the Project Area. Project Area is not within species' documented distribution. There are no known occurrences within a 5-mile radius of the Project Area.
Hermit warbler <i>Dendroica occidentalis</i>	—	SA	Breeds in major mountain ranges from San Gabriel and San Bernardino mountains northward in mature ponderosa pine, montane hardwood-conifer, mixed conifer, Douglas fir, redwood, red fir, and Jeffrey pine habitats.	May breed in mixed conifer forests near the Project Area. May forage in mixed conifer and oak-pine woodland in the Project Area. There are no known occurrences within a 5-mile radius of the Project Area.

Appendix E-1: Special-Status Wildlife Species Potentially Present in the Project Area

Species	Federal Status	State Status	Habitat Affiliation	Potential Occurrence
Lawrence's goldfinch <i>Carduelis lawrencei</i>	—	SA	Occurs in valley foothill hardwood and valley foothill hardwood-conifer. Breeds in open oak or other arid woodland and chaparral, near water.	May forage and breed in oak woodland or oak-pine woodlands near streams or forebays in the Project Area. There are no known occurrences within a 5-mile radius of the Project Area.
Tri-colored blackbird <i>Agelaius tricolor</i>	—	CSC	Breeds near freshwater, preferably in emergent wetland with tall dense cattails or tules, but also in thickets of willow, blackberry, wild rose, and tall herbs. Feeds in grassland and cropland habitats. Found throughout the Central Valley and on the coast.	Unlikely to occur in the Project Area. Project Area is not wit species' documented distribution. There are no known occurrences within a 5-mile radius of the Project Area. hin
Mammals				
Yuma myotis bat <i>Myotis yumanensis</i>	—	CSC	Year-round resident in most of California at lower elevations in a wide variety of habitats from coast to mid-elevation. Very tolerant of human habitation and survives in urbanized environments. Day roosts are in buildings, trees, mines, caves, bridges, and rock crevices. Night roosts are in buildings, bridges, and other man-made structures.	May occur in open forests and woodlands and in Project facilities such as powerhouses and tunnels in the Project Area. There are no known occurrences within a 5-mile radius of the Project Area.

Appendix E-1: Special-Status Wildlife Species Potentially Present in the Project Area

Species	Federal Status	State Status	Habitat Affiliation	Potential Occurrence
Long-eared myotis bat <i>Myotis evotis</i>	—	CSC	Year-round resident in California, occurring in mixed hardwood/conifer forest and montane conifer forest in northern California, and in pinyon-juniper, mesquite scrub, and pine/oak woodland in southern California. Typically roosts singly or in small groups in hollow trees, under exfoliating bark, crevices in rock outcrops, and occasionally in mines, caves, and buildings during the day.	May occur in mixed hardwood/conifer and montane conifer forests and in Project facilities such as powerhouses and tunnels in the Project Area. There are no known occurrences within a 5-mile radius of the Project Area.
Fringed myotis bat <i>Myotis thysanodes</i>	—	CSC	Widespread in California, occurring in all habitats excluding the Central Valley and Mojave desert. Occurs primarily in pinyon-juniper, valley-foothill hardwood, and hardwood conifer from 4,000 to 7,000 feet. Maternity colonies are in caves, mines, and buildings.	May occur in valley-foothill and hardwood conifer forests and in Project facilities such as powerhouses and tunnels in the Project Area. There are no known occurrences within a 5-mile radius of the Project Area.
Long-legged myotis bat <i>Myotis volans</i>	—	CSC	Common in California, occurring in the Coastal, Sierra, and Cascade ranges from sea level to 11,000 feet, primarily in coniferous forest, but also riparian and desert habitats. Maternity roosts are found in buildings, rock crevices, and under exfoliating bark. Males roost singly or in small numbers in rock crevices, buildings, and under tree bark. Night roosts are under bridges, in caves and mines, and in buildings.	May occur in mixed-conifer forests and in Project facilities such as powerhouses and tunnels in the Project Area. There are no known occurrences within a 5-mile radius of the Project Area.

Appendix E-1: Special-Status Wildlife Species Potentially Present in the Project Area

Species	Federal Status	State Status	Habitat Affiliation	Potential Occurrence
Small-footed myotis bat <i>Myotis ciliolabrum</i>	—	CSC	Occurs in the Sierra Nevada and deserts, commonly in arid uplands near water, from sea level to 9,000 feet. Roosts tend to be in rock crevices, cliff faces, and in talus formations. Maternity roosts are found in similar sites and have been observed in buildings.	May occur in arid uplands and in Project facilities such as powerhouses and tunnels in the Project Area. There are no known occurrences within a 5-mile radius of the Project Area.
Spotted bat <i>Euderma maculatum</i>	—	CSC	Habitats range from arid deserts and grasslands through mixed conifer forests up to 10,600 feet. Prefers sites with adequate roosting habitat, such as cliffs. Often limited by the availability of cliff habitat. Feeds over water and along marshes.	May occur in mixed-conifer forest and in Project facilities such as powerhouses and tunnels in the Project Area. There are no known occurrences within a 5-mile radius of the Project Area.
Pale Townsend's big-eared bat <i>Corynorhinus townsendii pallascens</i>	—	CSC	Occurs throughout California, in all but sub-alpine and alpine habitats. Most abundant in mesic habitats and requires caves, mines, tunnels, buildings, or other human-made structures for roosting.	May occur in mesic habitat and in Project facilities such powerhouses and tunnels in the Project Area. There are no known occurrences within a 5-mile radius of the Project Area.
Sierra Nevada red fox <i>Vulpes vulpes necator</i>	—	ST	Occurs throughout the Sierra Nevada at elevations above 7,000 feet in forests interspersed with meadows or alpine forests. Open areas are used for hunting, forested habitats for cover and reproduction.	Unlikely to occur in the Project Area. Project Area is not within species' documented distributional range. There are no known occurrences within a 5-mile radius of the Project Area.

Appendix E-1: Special-Status Wildlife Species Potentially Present in the Project Area

Species	Federal Status	State Status	Habitat Affiliation	Potential Occurrence
Pacific fisher <i>Martes pennanti pacifica</i>	FC	CSC	Suitable habitat consists of large areas of mature, dense forest, red fir, lodgepole pine, ponderosa pine, mixed conifer, and Jeffery pine forests with snags and greater than 50% canopy closure. Known from 4,000 to 8,000 feet elevations.	May occur. Appropriate habitat is available in mixed conifer forests within the Project Area. There are no known occurrences within a 5-mile radius of the Project Area.
California wolverine <i>Gulo gulo luteus</i>	—	ST, CFP	Mixed conifer, red fir, and lodgepole habitats, and probably sub-alpine conifer, alpine dwarf shrub, wet meadow, and montane riparian habitats. Occurs in Sierra Nevada from 4,300 to 10,800 feet. Majority of recorded sightings are found above 8,000 feet in elevation.	Unlikely to occur in the Project Area. Project Area is not within species' documented distribution.
Ringtail <i>Bassariscus astutus</i>	—	CFP	Widely distributed, occurs in various riparian habitats, and in brush stands of moist forest and shrub habitats, at low to middle elevations. Little information available on distribution and relative abundance among habitats.	May occur. Appropriate habitat is available in valley-foothill riparian and montane riparian forests in the Project Area. There are no known occurrences within a 5-mile radius of the Project Area.

Legend: FT = Federally Threatened FE = Federally Endangered FC = Federal Candidate Species SA = State Special Animal ST = State Threatened SE = State Endangered CSC = State Species of Special Concern CFP = California Fully Protected Life history and habitat information adapted from Zeiner et al. (1988-1990). California's Wildlife: Volumes I-III. California Department of Fish and Game, Rancho Cordova, California. CDFG. 2003. Rarefind II: California Natural Diversity Database. Electronic database. Updated November 2013. California Department of Fish and Game, Rancho Cordova, California. CDFG 2007. Special Animals. California Natural Diversity Database. Biogeographic Data Branch. Sacramento California. October 2007.
<http://www.dfg.ca.gov/biogeodata/cnddb/pdfs/SPAnimals.pdf>

Appendix E-2: Special-Status Plants Species Potentially Present in the Kilarc-Cow Project Area

Species	Federal Status	State Status	CNPS Status	Habitat Affiliation	Bloom Period	Potential Occurrence
Henderson's bent grass <i>Agrostis hendersonii</i>	—	—	3	Valley and foothill grassland (mesic), vernal pools; elevation 70-305 meters.	April – May	Low. Not observed.
Big-scale balsamroot <i>Balsamorhiza macrolepis</i> var. <i>macrolepis</i>),	—	—	1B	Grassland, serpentine bunchgrass grassland, mixed serpentine chaparral, mixed oak woodland and forest, and ponderosa pine forest and woodland; 50 1,500 meters	March – June	Observed between Cow Creek Project forebay and powerhouse.
Scalloped moonwort <i>Botrychium crenulatum</i>	—	—	2B	Great Basin scrub, lower montane coniferous forest (openings and drainages), meadows and seeps, vernal pools/clay, mesic; elevation 1005-1900 meters.	June – July	Low. Not observed.
Rattlesnake fern <i>Botrychium virginianum</i>	—	—	2B	Bogs and fens, lower montane coniferous forest (mesic), meadows and seeps, riparian forest/streams; elevation 728-1300 meters.	June – September	Low. Not observed
Long-haired star tulip <i>Calochortus longebarbatus</i> var. <i>longebarbatus</i>	—	—	1B	Great Basin scrub, lower montane coniferous forest (openings and drainages), meadows and seeps, vernal pools/clay, mesic; elevation 1005-1900 meters.	June – August	Low. Not observed.
Callahan's mariposa lily <i>Calochortus syntrophus</i>	—	—	3	Cismontane woodland, lower montane coniferous forest, valley and foothill grassland (vernally mesic); elevation 525-886 meters.	May – June	Moderate. Not observed.
Butte County morning-glory <i>Calystegia atriplicifolia</i> ssp. <i>buttensis</i>	—	—	1B	Chaparral, lower montane coniferous forest/rocky, sometimes roadside; elevation 600-1524 meters.	May – July	Moderate-high. Not observed.

Appendix E-2: Special-Status Plants Species Potentially Present in the Kilarc-Cow Project Area

Species	Federal Status	State Status	CNPS Status	Habitat Affiliation	Bloom Period	Potential Occurrence
Fox sedge <i>Carex vulpinoidea</i>	—	—	2B	Marshes and swamps (freshwater), riparian woodland; elevation 30-1200 meters.	May – June	Moderate. Not observed.
Shasta clarkia <i>Clarkia borealis</i> ssp. <i>arida</i>	—	—	1B	Cismontane woodland, lower montane coniferous forest (openings); elevation 490-595 meters.	June – August	Moderate. Not observed.
Northern clarkia <i>Clarkia borealis</i> ssp. <i>borealis</i>	—	—	1B	Chaparral, cismontane woodland, lower montane coniferous forest; elevation 400-1340 meters.	June – September	Low-moderate. Not observed.
Silky cryptantha <i>Cryptantha crinita</i>	—	—	1B	Cismontane woodland, lower montane coniferous forest, riparian forest, riparian woodland, valley and foothill grassland/gravelly streambeds; elevation 61-1215 meters.	April – May	Low. Not observed.
Mountain lady's-slipper <i>Cypripedium montanum</i>	—	—	4	Broadleaved upland forest, cismontane woodland, lower montane coniferous forest, North Coast coniferous forest; elevation 185-2225 meters.	March – August	Observed adjacent to Kilarc Project canal.
Butte County fritillary <i>Fritillaria eastwoodiae</i>	—	—	3	Chaparral, cismontane woodland, lower montane coniferous forest (openings)/ sometimes serpentine; elevation 50-1500 meters.	March – June	Moderate-high. Possibly observed.
Boggs Lake hedge-hyssop <i>Gratiola heterosepala</i>	—	E	1B	Marshes and swamps (lake margins), vernal pools/clay; elevation 10-2375 meters.	April – August	Low. Not observed.

Appendix E-2: Special-Status Plants Species Potentially Present in the Kilarc-Cow Project Area

Species	Federal Status	State Status	CNPS Status	Habitat Affiliation	Bloom Period	Potential Occurrence
Baker's globe mallow <i>Liamna bakeri</i>	—	—	4	Chaparral, Great Basin scrub, lower montane coniferous forest (openings), piñon and juniper woodland/volcanic, often burned areas; elevation 1000-2500 meters.	June – September	Moderate. Not observed.
Red Bluff dwarf rush <i>Juncus leiospermus</i> var. <i>leiospermus</i>	—	—	1B	Chaparral, cismontane woodland, meadows and seeps, valley and foothill grassland, vernal pools/vernally mesic; elevation 35-1020 meters.	March – May	Low. Not observed.
Bellinger's meadowfoam <i>Limnanthes floccosa</i> ssp. <i>bellingariana</i>	—	—	1B	Cismontane woodland, meadows and seeps/mesic; elevation 290-1100 meters.	April – June	Low. Not observed.
Shasta snow-wreath <i>Neviusia cliffonii</i>	—	—	1B	Cismontane woodland, lower montane coniferous forest, riparian woodland/often stream-sides; sometimes carbonate, volcanic, or metavolcanic; elevation 300-500 meters	April – June	Low-moderate. Not observed.
Slender Orcutt grass <i>Orcuttia tenuis</i>	T	E	1B	Vernal pools; elevation 35-1760 meters	May – October	Low. Not observed.
Ahart's paronychia <i>Paronychia ahartii</i>	—	—	1B	Cismontane woodland, valley and foothill grassland, vernal pools; elevation 30-510 meters.	March- June	Low-Moderate. Not observed.
Newberry's cinquefoil <i>Potentilla newberryi</i>	—	—	2B	Marshes and swamps (drying margins), vernal pools; elevation 1300~2200 meters.	May – August	Low. Not observed.
Brownish beaked-rush <i>Rhynchospora capitellata</i>	—	—	2B	Lower montane coniferous forest, meadows and seeps, marshes and swamps, upper montane coniferous forest/mesic; elevation 455-2000 meters.	July – August	Low. Not observed.

Appendix E-2: Special-Status Plants Species Potentially Present in the Kilarc-Cow Project Area

Species	Federal Status	State Status	CNPS Status	Habitat Affiliation	Bloom Period	Potential Occurrence
Sanford's arrowhead <i>Sagittaria sanfordii</i>	—	—	1B	Marshes and swamps (assorted shallow freshwater); elevation 0–650 meters.	May – October	Low. Not observed.
Western campion <i>Silene occidentalis</i> ssp. <i>longistipitata</i>	—	—	1B	Chaparral, lower montane coniferous forest, upper montane coniferous forest; elevation 1000–2000 meters.	June – August	Moderate. Not observed.
English Peak greenbriar <i>Smilax jamesii</i>	—	—	1B	Broadleaved upland forest, lower montane coniferous forest, marshes and swamps, North Coast coniferous forest/streambanks and lake margins; elevation 580–2500 meters.	May – August	Moderate. Not observed.
Marsh hedge nettle <i>Stachys palustris</i> ssp. <i>pilosa</i>	—	—	2B	Great Basin scrub (mesic); meadows and seeps; elevation 1200–1770 meters.	June – August	Low. Lot observed.
Siskiyou clover <i>Trifolium siskiyouense</i>	—	—	3	Meadows and seeps/mesic; elevation 880–1500 meters.	June – July	Low. Not observed.
Oval-leaved viburnum <i>Viburnum ellipticum</i>	—	—	2B	Chaparral, cismontane woodland, lower montane coniferous forest; elevation 215–1400 meters.	May – June	Moderate. Not observed.

Legend

FT = Federally Threatened FE = Federally Endangered FC = Federal Candidate Species

ST = State Threatened SE = State Endangered

CNPS 1B = Rare, threatened, or endangered in California and elsewhere

CNPS 2B = Rare, threatened, or endangered in California, but more common elsewhere

CNPS 3 = More information is needed – a review list

CNPS 4 = Plants of limited distribution – a watch list

2017

Appendix E-1: Special-status Wildlife Species with Potential to Occur in the Project Area

Species	Listing Status (Federal ESA/State ESA/Other)	Habitat Characteristics/Range	Potential Occurrence
Invertebrates			
Conservancy fairy shrimp <i>Branchinecta conservatio</i>	FE/--/--	Inhabit astatic pools located in swales formed by old, braided alluvium; filled by winter/spring rains, last until June. Endemic to the grasslands of the northern two-thirds of the Central Valley; found in large, turbid pools	Unlikely to occur due to lack of suitable habitat. There are no known occurrences within a 5-mile radius of the Project Area.
Vernal pool fairy shrimp <i>Branchinecta lynchi</i>	FT/--/--	Endemic to the grasslands of the Central Valley, Central Coast mountains, and South Coast mountains, in astatic rain-filled (vernal) pools. Inhabit small, clear-water sandstone-depression pools and grassed swale, earth slump, or basalt-flow depression pools. Known from up to 950 feet in elevation	Unlikely to occur due to lack of suitable habitat. There are no known occurrences within a 5-mile radius of the Project Area.
Valley elderberry longhorn beetle <i>Desmocerus californicus dimorphus</i>	FT/--/--	Occurs only in the Central Valley of California, in association with blue elderberry (<i>Sambucus mexicana</i>). Prefers to lay eggs in elderberries 2-8 inches in diameter; some preference shown for "stressed" elderberries.	May occur. Appropriate habitat is present in elderberry shrubs within the Project Area. Two shrubs are located near the South Cow Creek Canal. One non-specific occurrence is mapped within a 5-mile radius of the Project Area. No VELB were detected during 2003 focused surveys.
Vernal pool tadpole shrimp <i>Lepidurus packardii</i>	FE/--/--	Inhabits vernal pools, swales, slumps, and basalt flow depressions in the Sacramento Valley from east of Redding in Shasta County south to the San Luis National Wildlife Refuge in Merced County Pools commonly found in grass-bottomed swales of unplowed grasslands. Some pools are mud-bottomed and contain clear to highly turbid water.	Unlikely to occur due to lack of suitable habitat. There are no known occurrences within a 5-mile radius of the Project Area.
Shasta crayfish <i>Pacifastacus fortis</i>	FE/SE/--	Found only in the Fall and Hat creek sub-drainages of the Pit River system. Inhabits cool, low gradient, spring-fed headwaters characterized by clean, volcanic cobbles and boulders overlying sand or gravel substrates with little vegetation.	Unlikely to occur in the Project Area. Project Area located outside of species' documented distribution. There are no known occurrences within a 5-mile radius of the Project Area.
Amphibians			
Southern long-toed salamander <i>Ambystoma macrodactylum sigillatum</i>	--/--/CSC	High elevation meadows and lakes in the Sierra Nevada, Cascade, and Klamath mountains. Preferred habitats include ponderosa pine, montane hardwood-conifer, mixed conifer, montane riparian, red fir and wet meadows. Found from near sea level to 2800 m. Aquatic larvae occur in ponds and lakes. Outside of breeding season adults are terrestrial and associated with underground burrows of mammals and moist areas under logs and rocks.	Unlikely to occur due to lack of suitable habitat. There are no known occurrences within a 5-mile radius of the Project Area.
Pacific tailed frog <i>Ascaphus truei</i>	--/--/CSC	Occurs in montane hardwood-conifer, redwood, Douglas fir and ponderosa pine habitats; from 0 to 6,500 feet. Restricted to perennial montane streams with low temperatures, tadpoles require water below 15°C. Coastal Mendocino County north to the Oregon border with a disjunct population in the Shasta region.	Unlikely to occur. Project Area located outside of species' documented distribution. There are no known occurrences within a 5-mile radius of the Project Area.
Shasta salamander <i>Hydromantes shastae</i>	--/ST/--	Cool, wet ravines and valleys; dominant vegetation is oak woodland or chaparral, also pine and fir; from 100 to 2,550 feet. Seeks cover under surface objects such as logs, rocks, and limestone slabs or talus, near limestone fissures or caves. Uncommon in limestone areas in the vicinity of Shasta Reservoir in Shasta County.	Unlikely to occur. Project Area located outside of species' documented distribution. There are no known occurrences within a 5-mile radius of the Project Area.
Foothill yellow-legged frog <i>Rana boylei</i>	--/SCT/CSC	Breeds cool, clear water, partly-shaded, shallow streams and riffles with a rocky substrate in a variety of habitats including valley and foothill oak woodland, riparian forest, ponderosa pine, mixed conifer, coastal scrub, mixed chaparral, and wet meadows; occurs at elevations ranging from 0 to 6,000 feet. Needs at least some cobble-sized substrate for egg-laying. Needs at least 15 weeks to attain metamorphosis.	Known to occur. There are two CNDDDB records for this species on Old Cow Creek. This species was detected in South Cow Creek and Hooten Gulch during 2003 reconnaissance wildlife surveys and focused foothill yellow-legged frog surveys.
California red-legged frog <i>Rana draytonii</i>	FT/--/CSC	Breeds in quiet streams and permanent, deep, cool ponds with overhanging and emergent vegetation below 4,000 feet elevation. Known to occur adjacent to breeding habitats in riparian areas and heavily vegetated streamside shorelines, and in non-native grasslands.	May occur. No appropriate spawning habitat was found in the Project Area during the Site Assessment, but several ponds on private land within the Site Assessment Area may be suitable. Potential summer habitat exists along Hooten Gulch within 100 meters of its confluence with South Cow Creek. There are no known occurrences within a 5-mile radius of the Project Area. Not detected during amphibian surveys

Appendix E-1: Special-status Wildlife Species with Potential to Occur in the Project Area

Species	Listing Status (Federal ESA/State ESA/Other)	Habitat Characteristics/Range	Potential Occurrence
Cascades frog <i>Rana cascadae</i>	--/SCE/CSC	Montane aquatic habitats such as mountain lakes, small streams, and ponds in meadows; open coniferous forests. Standing water required for reproduction. Individuals are active during late spring and summer. Hibernates in mud on the bottom of lakes and ponds during the winter.	Unlikely to occur due to lack of suitable habitat. There are no known occurrences within a 5-mile radius of the Project Area.
Western spadefoot toad <i>Spea hammondi</i>	--/--/CSC	Occurs primarily in grassland habitats, but can be found in valley-foothill hardwood woodlands or orchards. Vernal pools and/or seasonal wetlands are essential for breeding and egg-laying.	Unlikely to occur due to lack of suitable habitat. There are no known occurrences within a 5-mile radius of the Project Area.
Reptiles			
Western pond turtle <i>Emys marmorata</i>	--/--/CSC	A thoroughly aquatic turtle of ponds, marshes, rivers, streams and irrigation ditches, usually with aquatic and/or overhanging vegetation, below 6,000 feet. Needs suitable basking sites (logs and rocks above waterline) and upland habitat (sandy banks or grassy open fields) up to 0.5 km from water for egg-laying.	Known to occur. There are 4 CNDDDB occurrences within 5 miles of the Project Area. Detected incidentally in Hooten Gulch and near the Cow Creek Powerhouse during surveys.
California horned lizard <i>Phrynosoma coronatum frontale</i>	--/--/CSC	Exposed sandy-gravelly substrate with scattered shrubs, clearings in riparian woodlands, and annual grasslands. Ranges in the Central Valley from southern Tehama County south; in the Sierra foothills from Butte County to Tulare County below 4,000 feet; ranging from sea level to 4,000 feet in the Sierra foothills.	Unlikely to occur. Project Area located outside of species' documented distribution. There are no known occurrences within a 5-mile radius of the Project Area.
Birds			
Northern goshawk <i>Accipiter gentilis</i>	--/--/CSC	Prefers middle to high elevation, mature, dense conifer forests for foraging and nesting. Casual in foothills during winter, northern deserts in pinyon-juniper woodland, and low elevation riparian habitats. Nests on north-facing slopes near water. Uses old nests, and maintains alternate sites. Usually nests on north slopes, near water. Red fir, lodgepole pine, Jeffrey pine, and aspens are typical nest trees.	May occur. May forage in riparian, oak woodland, or mixed conifer habitat and may also breed in forest habitats in the Project Area. There is one CNDDDB record approximately 5 miles from the Project Area.
Tri-colored blackbird <i>Agelaius tricolor</i>	--/SCE/CSC	Highly colonial species, most numerous in Central Valley and vicinity. Breeds near freshwater, preferably in emergent wetland with tall dense cattails or tules, but also in thickets of willow, blackberry, wild rose, and tall herbs. Found throughout the Central Valley and on the coast. Requires open water, protected nesting substrate, and foraging area with insect prey (e.g., grassland and cropland habitats) within a few miles of the colony.	Unlikely to occur. Project Area is not within the species' documented distribution. There is one occurrence of this species approximately 4 miles from Project Area, however the species is not likely to nest within the Project Area.
Golden eagle <i>Aquila chrysaetos</i>	--/--/CFP	Habitat is typically rolling foothills, mountain areas, sage juniper flats, grasslands, and early successional forest. Cliff-walled canyons provide nesting habitat in most parts of range; also, large trees in open areas.	Known to occur. Detected incidentally during surveys near the Cow Creek Forebay. May nest or forage in grasslands, oak woodland, or mixed conifer forest in the Project Area. There are no CNDDDB occurrences within a 5-mile radius of the Project Area.
Short-eared owl <i>Asio flammeus</i>	--/--/CSC	Occurs in the Central Valley and western Sierra foothills in open areas with few trees, such as annual and perennial grasslands, prairies, dunes, meadows, irrigated lands, and saline and fresh emergent wetlands. This species occurs only along the northeast edge of Shasta County.	Unlikely to occur. Project Area is not within species' documented distribution. There are no known occurrences within a 5-mile radius of the Project Area.
Western burrowing owl <i>Athene cunicularia</i>	--/--/CSC	Open, dry annual or perennial grasslands, deserts, and scrublands characterized by low-growing vegetation, up to 5,300 feet (1600 m). Subterranean nester, dependent upon burrowing mammals, most notably, the California ground squirrel.	May occur. Appropriate breeding and foraging habitat is present within grasslands in the Project Area. There are no known occurrences within a 5-mile radius of the Project Area.
Cackling (=Aleutian Canada) goose <i>Branta hutchinsii leucopareia</i>	FD/--/--	Occurs in pastures and grain fields in the Central Valley. Winters on lakes and inland prairies. Forages on natural pasture or that cultivated to grain; loafes on lakes, reservoirs, ponds	Unlikely to occur in the Project Area due to lack of suitable habitat. There are no known occurrences within a 5-mile radius of the Project Area.
Swainson's hawk <i>Buteo swainsoni</i>	--/ST/--	Breeding resident and migrant in the Central Valley, Klamath Basin, Northeastern Plateau, Lassen County, and Mojave Dessert. Requires large, open grasslands with abundant prey in association with suitable nest trees. Nests in mature riparian forest, groves of oaks, and mature roadside trees.	May occur. Appropriate habitat is present in the grassland (foraging) and woodland (nesting) habitats of the Project Area, particularly in the southern portion of the South Cow Creek Project vicinity. There are no known occurrences within a 5mile radius of the Project Area.
Vaux's swift <i>Chaetura vauxi</i>	--/--/CSC	Prefers redwood and Douglas fir habitats with nest sites in large, hollow trees and snags, especially tall, burned-out stubs. Forages over moist terrain and habitats, preferring rivers and lakes. Summer resident of northern California.	May occur. May forage and breed in mixed conifer forest near streams and forebays in the Project Area. There are no known occurrences within a 5-mile radius of the Project Area.

Appendix E-1: Special-status Wildlife Species with Potential to Occur in the Project Area

Species	Listing Status (Federal ESA/State ESA/Other)	Habitat Characteristics/Range	Potential Occurrence
Western yellow-billed cuckoo <i>Coccyzus americanus occidentalis</i>	FT/SE/--	Valley foothill and desert riparian habitats in scattered locations in California; breeds along the Colorado River, Sacramento and Owens valleys, South Fork of the Kern River, Santa Ana River, and the Amargosa River.	Unlikely to occur. Project Area is not within species' documented distribution. There are no known occurrences within a 5-mile radius of the Project Area.
Black swift <i>Cypseloides niger</i>	--/--/CSC	Breeds very locally in the Sierra Nevada and Cascade ranges. Nests in moist crevices or caves, or on cliffs near waterfalls in deep canyons. Forages widely over many habitats; seems to avoid arid regions.	Unlikely to occur. Project Area is not within species' documented distribution. There are no known occurrences within a 5-mile radius of the Project Area.
White-tailed kite <i>Elanus leucurus</i>	--/--/CFP	Coastal and valley lowlands. Herbaceous and open stages of most habitats; grasslands and agricultural areas are used for foraging; typically nests in tops of dense oak, willow, or other tree stands adjacent to open areas and agricultural fields.	May occur. Appropriate breeding and foraging habitat is present in South Cow Creek. There are no known occurrences within a 5-mile radius of the Project Area.
Little willow flycatcher <i>Empidonax traillii brewsteri</i>	--/SE/--	Occurs in broad, open river valleys or large mountain meadows with lush growth of shrubby willows, wet meadow and montane riparian habitats from 2,000 to 8,000 feet. Breeding seldom occurs below 5,000 feet.	May occur. May forage in riparian habitat and may breed within reaches of South Cow Creek in the Project Area. There are no known occurrences within a 5-mile radius of the Project Area.
American peregrine falcon <i>Falco peregrinus americana</i>	FD/SD/CFP	Near wetlands, lakes, rivers, or other water; on cliffs, banks, dunes, mounds; also, human-made structures. Nest consists of a scrape or a depression or ledge in an open site and/or on high cliffs and banks.	Known to occur. Documented nesting in the Cow Creek watershed (Watershed Assessment 2001). May forage in or near Kilarc or Cow Creek Forebays and in stream habitat in Project Area. One (non-specific) occurrence of this species is mapped within 5-miles of the Project Area in a location with a 200-foot lava cliff. This species was not detected during 2003 focused surveys.
Bald eagle <i>Haliaeetus leucocephalus</i>	FD/SE/CFP	Utilizes large trees, snags or broken-topped trees near water for foraging. Ocean shore, lake margins, and rivers for both nesting and wintering. Most nests within 1 mile of water. Nests in large, old-growth, or dominant live tree with open branches, especially ponderosa pine. Roosts communally in winter. Occurs in low to mid-range elevations of the Sierra Nevada. Year-round in Shasta County.	Known to occur. Have been observed roosting and foraging at the Kilarc Forebay (PG&E, pers. com.). Not observed during focused surveys. There are no CNDDDB records within a 5-mile radius of the Project Area.
Loggerhead shrike <i>Lanius ludovicianus</i>	--/--/CSC	Open habitats with sparse shrubs and trees (or other suitable perch sites) and bare ground and/or low, sparse herbaceous cover; oak woodlands for nesting. Found in lowlands and foothills throughout California.	May occur. May forage in oak woodlands or riparian habitat in the Project Area. May breed in oak woodlands in the Project Area. There are no known occurrences within a 5-mile radius of the Project Area.
California black rail <i>Laterallus jamaicensis coturniculus</i>	--/ST/CFP	Inhabits freshwater marshes, wet meadows and shallow margins of saltwater marshes bordering larger bays. Needs water depths of about 1 inch that do not fluctuate during the year and dense vegetation for nesting habitat.	Unlikely to occur. Project Area is not within species' documented distribution. There are no known occurrences within a 5-mile radius of the Project Area.
Purple martin <i>Progne subis</i>	--/--/CSC	Inhabits woodlands, low elevation coniferous forest of Douglas-fir, ponderosa pine, and Monterey pine. Nests in old woodpecker cavities mostly; also in human-made structures. Nest often located in tall, isolated tree/snag.	Unlikely to occur. Project Area is not within species' documented distribution. There are no known occurrences within a 5-mile radius of the Project Area.
Bank swallow <i>Riparia riparia</i>	--/ST/--	Migrant found primarily in riparian and other lowland habitats in California west of the deserts. Colonial nester; nests primarily in riparian and other lowland habitats west of the desert. Requires vertical banks/cliffs with fine-textured/sandy soils near streams, rivers, lakes, ocean to dig nesting hole.	Unlikely to occur. Project Area is not within species' documented distribution. There are no known occurrences within a 5-mile radius of the Project Area.
Northern spotted owl <i>Strix occidentalis caurina</i>	FT/ST/CSC	Occurs in dense, old-growth, multi-layered mixed conifer, redwood, and Douglas fir habitats, from sea level up to 7,600 feet. Occasionally in younger forests with patches of big trees. Prefers high, multistory canopy dominated by big trees, many trees with cavities or broken tops, woody debris, and space under canopy.	May occur. Appropriate breeding and foraging habitat is present in mixed conifer within the Project Area. There are no known occurrences within a 5-mile radius of the Project Area.
Mammals			
Pallid bat <i>Antrozous pallidus</i>	--/--/CSC	Deserts, grasslands, shrublands, woodlands and forests. Most common in open, dry habitats with rocky areas for roosting. Roosts must protect bats from high temperatures. Very sensitive to disturbance of roosting sites. Locally common species of low elevations in California. Occurs from Shasta to Kern Counties.	Unlikely to occur. Project Area is not within species' documented distribution and outside of species' elevational range. There are no known occurrences within a 5-mile radius of the Project Area.

Appendix E-1: Special-status Wildlife Species with Potential to Occur in the Project Area

Species	Listing Status (Federal ESA/State ESA/Other)	Habitat Characteristics/Range	Potential Occurrence
Ring-tailed cat <i>Bassariscus astutus</i>	--/--/CFP	Widely distributed, occurs in various riparian habitats, and in brush stands of most forest and shrub habitats, at low to middle elevations. Little information available on distribution and relative abundance among habitats.	May occur. Appropriate habitat is available in valley-foothill riparian and montane riparian forests in the Project Area. There are no known occurrences within a 5-mile radius of the Project Area.
Gray wolf <i>Canis lupus</i>	FE/SE/--	Habitat generalists, historically occupying diverse habitats including tundra, forests, grasslands, and deserts. Primary habitat requirements are the presence of adequate ungulate prey, water, and low human contact.	Unlikely to occur. Project Area is not within species' documented distribution. There are no known occurrences within a 5mile radius of the Project Area.
Townsend's big-eared bat <i>Corynorhinus townsendii</i>	--/--/CSC	Throughout California in a wide variety of habitats except sub-alpine and alpine habitats. Most common in mesic sites. Requires caves, mines, tunnels, buildings, or other human-made structures for roosting. Roosts in the open, hanging from walls and ceilings. Extremely sensitive to human disturbance.	May occur in mesic habitat and in Project facilities such powerhouses and tunnels in the Project Area. There are no known occurrences within a 5-mile radius of the Project Area.
Spotted bat <i>Euderma maculatum</i>	--/--/CSC	Occupies a wide variety of habitats from arid deserts and grasslands through mixed conifer forests up to 10,600 feet. Feeds over water and along washes. Feeds over water an along marshes, almost entirely on moths. Needs rock crevices in cliffs or caves for roosting.	May occur in mixed-conifer forest and in Project facilities such as powerhouses and tunnels in the Project Area. There are no known occurrences within a 5-mile radius of the Project Area.
California wolverine <i>Gulo gulo</i>	PFT/ST/CFP	Found in the north coast mountains and the Sierra Nevada from 4,300 to 10,800 feet' most commonly at 8,000 feet. Mixed conifer, red fir, and lodgepole habitats, and probably sub-alpine conifer, alpine dwarf shrub, wet meadow, and montane riparian habitats. Needs water source. Uses caves, logs, burrows for cover and den area. Hunts in more open areas. Can travel long distances.	Unlikely to occur. Project Area is not within species' documented distribution.
Western red bat <i>Lasiurus blossevillii</i>	--/--/CSC	Roosts primarily in trees, 2-40 feet above ground, from sea level up through mixed conifer forests. Prefers habitat edges and mosaics with trees that are protected from above and open below with open areas for foraging.	May occur in open forests and woodlands and in Project facilities such as powerhouses and tunnels in the Project Area. There are no known occurrences within a 5-mile radius of the Project Area.
Fisher - West Coast DPS <i>Pekania pennanti</i>	--/SCT/CSC	Needs large areas of mature, dense forest, red fir, lodgepole pine, ponderosa pine, mixed conifer, and Jeffery pine forests with snags and greater than 50% canopy closure. Known from 4,000 to 8,000 feet elevations. Uses cavities, snags, logs and rocky areas for cover and denning.	Known to occur. Nine occurrences are mapped within 5-miles of the Project Area. Appropriate habitat is available in mixed conifer forests within the Project Area.
Sierra Nevada red fox <i>Vulpes vulpes necator</i>	FC/ST/--	Historically found from the Cascades down to the Sierra Nevada; elevations above 7,000. Found in a variety of habitats from wet meadows to alpine forested areas. Prefer forests interspersed with meadows or alpine fell-fields. Open areas are used for hunting, forested habitats for cover and reproduction.	Unlikely to occur. Project Area is not within species' documented distribution and outside of species' elevational range. There are no known occurrences within a 5-mile radius of the Project Area.
<i>Taxidea taxus</i> American badger	--/--/CSC	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils. Needs sufficient food, friable soils and open, uncultivated ground. Preys on burrowing rodents. Digs burrows.	May occur. Appropriate habitat is available in mixed conifer forests within the Project Area. There are no known occurrences within a 5-mile radius of the Project Area.

Sources: CDFG 2003, CDFG 2007, CDFW 2017a, CDFW 2017b, Watershed Assessment 2001, Zeiner et al. 1988-1990.

Codes:

Federal ESA Listings

- FC Federal Candidate
- FE Federal Endangered
- FD Federal Delisted
- FT Federal Threatened
- PFT Proposed Federal Threatened

State ESA Listings

- SCE State Candidate Endangered
- SCT State Candidate Threatened
- SD State Delisted
- SE State Endangered
- ST State Threatened

Other Listings

- CSC = California Species of Special Concern
- CFP = California Fully Protected

Appendix E-2: Special-status Plant Species with Potential to Occur in the Project Area

Species	Listing Status (Fed ESA/State ESA/Other)	Habitat Characteristics	Bloom Period	Potential Occurrence
Shasta ageratina <i>Ageratina shastensis</i>	--/--/CRPR 1B.2	Chaparral, lower montane coniferous forest. Rocky, sometimes limestone; elevation 365-1725 meters.	June - October	Low. Not observed.
Henderson's bent grass <i>Agrostis hendersonii</i>	--/--/CRPR 3.2	Valley and foothill grassland, vernal pools. Moist places in grassland or vernal pool habitat; elevation 65-1030 meters.	April – May	Low. Not observed.
Big-scale balsamroot <i>Balsamorhiza macrolepis</i>	--/--/CRPR 1B.2	Grassland, serpentine bunchgrass grassland, mixed serpentine chaparral, mixed oak woodland and forest, and ponderosa pine forest and woodland; 35-1500 meters.	March – June	Observed between Cow Creek Project forebay and powerhouse.
Upswept moonwort <i>Botrychium ascendens</i>	--/--/CRPR 2B.3	Lower montane coniferous forest, meadows and seeps. Grassy fields, coniferous woods near springs and creeks; elevation 1115-3265 meters.	July - August	Moderate. Known to occur within 5-miles of the Project Area.
Scalloped moonwort <i>Botrychium crenulatum</i>	--/--/CRPR 2B.2	Great Basin scrub, upper and lower montane coniferous forest (openings and drainages), bogs and fens, meadows and seeps, marshes and swamps, vernal pools/clay, mesic; elevation 1005-3110 meters.	June – July	Moderate. Known to occur within 5-miles of the Project Area.
Mingan moonwort <i>Botrychium minganense</i>	--/--/CRPR 2B.2	Lower montane coniferous forest, upper montane coniferous forest, bogs and fens, meadows and seeps. Creek banks in mixed conifer forest; elevation 1190-3295 meters.	July - September	Low. Not observed.
Western goblin <i>Botrychium montanum</i>	--/--/CRPR 2B.1	Lower montane coniferous forest, upper montane coniferous forest, meadows and seeps. Creek banks in old-growth forest; elevation 1430-2430 meters.	July - September	Low. Not observed.
Northwestern moonwort <i>Botrychium pinnatum</i>	--/--/CRPR 2B.3	Lower montane coniferous forest, meadows and seeps, upper montane coniferous forest. Creek banks; elevation 1645-2045 meters.	July – October	Low. Not observed.

Appendix E-2: Special-status Plant Species with Potential to Occur in the Project Area

Species	Listing Status (Fed ESA/State ESA/Other)	Habitat Characteristics	Bloom Period	Potential Occurrence
Rattlesnake fern <i>Botrychum virginianum</i>	--/--/CRPR 2B.2	Bogs and fens, lower montane coniferous forest (mesic), meadows and seeps, riparian forest/streams; elevation 710-1405 meters.	June – September	Moderate. Known to occur within 5-miles of the Project Area. Not observed.
Long-haired star tulip <i>Calochortus longebarbatus</i> var. <i>longebarbatus</i>	--/--/CRPR 1B.2	Great Basin scrub, lower montane coniferous forest (openings and drainages), meadows and seeps, vernal pools/clay, mesic; elevation 975-2865 meters. In wet meadows or grassy areas along drainages within forest; clay soils.	June – August	Low. Not observed.
Callahan's mariposa lily <i>Calochortus syntrophus</i>	--/--/CRPR 1B.1	Cismontane woodland, lower montane coniferous forest, valley and foothill grassland (vernally mesic); elevation 430-1220 meters.	May – June	Moderate. Known to occur within 5-miles of the Project Area. Not observed.
Butte County morning-glory <i>Calystegia atriplicifolia</i> ssp. <i>buttensis</i>	--/--/CRPR 4.2	Chaparral, lower montane coniferous forest/rocky, sometimes roadside; elevation 565-1525 meters. Dry, mostly open slopes.	May – July	Moderate-high. Not observed.
Lassen paintbrush <i>Castilleja lasseensis</i>	--/--/CRPR 1B.3	Subalpine coniferous forest, meadows and seeps. Volcanic; elevation 955-3120 meters.	June - September	Low. Not observed.
Shasta clarkia <i>Clarkia borealis</i> ssp. <i>arida</i>	--/--/CRPR 1B.1	Cismontane woodland, lower montane coniferous forest (openings); elevation 425-595 meters.	June – August	Moderate. Known to occur within 5-miles of the Project Area. Not observed.
Northern clarkia <i>Clarkia borealis</i> ssp. <i>borealis</i>	--/--/CRPR 1B.3	Chaparral, cismontane woodland, lower montane coniferous forest; elevation 345-1540 meters. Often seen in road cuts.	June – September	Moderate. Known to occur within 5-miles of the Project Area. Not observed.

Appendix E-2: Special-status Plant Species with Potential to Occur in the Project Area

Species	Listing Status (Fed ESA/State ESA/Other)	Habitat Characteristics	Bloom Period	Potential Occurrence
Silky cryptantha <i>Cryptantha crinita</i>	--/--/CRPR 1B.2	Cismontane woodland, lower montane coniferous forest, riparian forest, riparian woodland, valley and foothill grassland/gravelly streambeds; elevation 35-1220 meters.	April – May	Moderate. Known to occur within 5-miles of the Project Area. Not observed.
Mountain lady's-slipper <i>Cypripedium montanum</i>	--/--/CRPR 4.2	Broad-leaved upland forest, cismontane woodland, lower montane coniferous forest, North Coast coniferous forest; elevation 185-2225 meters.	March – August	Observed adjacent to Kilarc Project canal.
<i>Epilobium oreganum</i> Oregon fireweed	--/--/CRPR 1B.2	Bogs and fens, meadows and seeps, lower montane coniferous forest, upper montane coniferous forest. In and near springs and bogs; at least sometimes on serpentine; elevation 575-2075 meters.	June - September	Low. Not observed.
Shasta limestone monkeyflower <i>Erythranthe taylorii</i>	--/--/CRPR 1B.1	Cismontane woodland, lower montane coniferous forest. Openings, carbonate crevices and rocky outcrops; elevation 325-1040 meters.	(February) April – May	Low. Not observed.
Shasta fawn lily <i>Erythronium shastense</i>	--/--/CRPR 1B.2	Cismontane woodland, lower montane coniferous forest. Usually carbonate, rocky, north-facing or shaded slopes; elevation 345-1020 meters.	(February) March - April	Low. Not observed.
Butte County fritillary <i>Fritillaria eastwoodiae</i>	--/--/CRPR 3.2	Chaparral, cismontane woodland, lower montane coniferous forest (openings)/ sometimes serpentine; elevation 50-1500 meters. Usually on dry slopes but also found in wet places; soils can be serpentine, red clay, or sandy.	March – June	Moderate-high. Known to occur within 5-miles of the Project Area. Possibly observed.
Boggs Lake hedge-hyssop <i>Gratiola heterosepala</i>	--/SE/CRPR 1B.2	Marshes and swamps (lake margins); elevation 4-2410 meters. Clay soils; usually in vernal pools, sometimes on lake margins.	April – August	Low. Not observed.

Appendix E-2: Special-status Plant Species with Potential to Occur in the Project Area

Species	Listing Status (Fed ESA/State ESA/Other)	Habitat Characteristics	Bloom Period	Potential Occurrence
Jepson's horkelia <i>Horkelia daucifolia</i> var. <i>indicta</i>	--/--/CRPR 1B.1	Cismontane woodland. Quaternary pyroclastic flows, volcanic or clay soils. Vernally mesic, openings; elevation 240-670 meters.	April - June	Moderate. Known to occur within 5-miles of the Project Area. Not observed.
Little hulsea <i>Hulsea nana</i>	--/--/CRPR 2B.3	Alpine boulder and rock field, subalpine coniferous forest. Rocky or gravelly sites; on volcanic substrates; elevation 1705-3170 meters.	July - August	Low. Not observed.
Baker's globe mallow <i>Liamna bakeri</i>	--/--/CRPR 4.2	Chaparral, Great Basin scrub, lower montane coniferous forest (openings), piñon and juniper woodland/volcanic, often burned areas; elevation 1000-2500 meters.	June – September	Moderate. Not observed.
Finger rush <i>Juncus digitatus</i>	--/--/CRPR 1B.1	Cismontane woodland (openings), lower montane coniferous forest (openings), vernal pools. In full sun, in the vernally damp ground of seeps, vernal pools and swales on gentle slopes over volcanic bedrock; elevations 600-790 meters.	April (May – June)	Low. Not observed.
Red Bluff dwarf rush <i>Juncus leiospermus</i> var. <i>leiospermus</i>	--/--/CRPR 1B.1	Chaparral, cismontane woodland, meadows and seeps, valley and foothill grassland, vernal pools/vernally mesic; elevation 35-1020 meters.	March – May	Low. Not observed.
Santa Lucia dwarf rush <i>Juncus luciensis</i>	--/--/CRPR 1B.2	Vernal pools, meadows and seeps, lower montane coniferous forest, chaparral, and Great Basin scrub. Vernal pools, ephemeral drainages, wet meadow habitats and stream sides; elevation 300-2040 meters.	April - July	Low. Not observed.
Dubious pea <i>Lathyrus sulphureus</i> var. <i>argillaceus</i>	--/--/CRPR 3	Cismontane woodland, lower montane coniferous forest, upper montane coniferous forest; elevation 150-930 meters.	April - May	Low. Not observed.
Legenere <i>Legenere limosa</i>	--/--/CRPR 1B.1	Vernal pools. In beds of vernal pools; elevation 1-880 meters.	April - June	Low. Not observed.

Appendix E-2: Special-status Plant Species with Potential to Occur in the Project Area

Species	Listing Status (Fed ESA/State ESA/Other)	Habitat Characteristics	Bloom Period	Potential Occurrence
Bellinger's meadowfoam <i>Limnanthes floccosa</i> ssp. <i>bellingiana</i>	--/--/CRPR 1B.2	Cismontane woodland, meadows and seeps/mesic including wet edges of meadows, and damp, stony flats; elevation 290-1100 meters.	April – June	Low. Not observed.
Woolly meadowfoam <i>Limnanthes floccosa</i> ssp. <i>floccosa</i>	--/--/CRPR 4.2	Chaparral, cismontane woodland, valley and foothill grassland, vernal pools. Vernally wet areas, ditches, and ponds; elevation 60-1335 meters.	March – May (June)	Low. Not observed.
Broad-nerved hump moss <i>Meesia uliginosa</i>	--/--/CRPR 2B.2	Meadows and seeps, bogs and fens, upper montane coniferous forest, subalpine coniferous forest. Moss on damp soil. Often found on the edge of fens or raised above the fen on hummocks/shrub bases; elevation 1095-2805 meters.	July - October	Low. Not observed.
Baker's navarretia <i>Navarretia</i> <i>leucocephala</i> ssp. <i>bakeri</i>	--/--/CRPR 1B.1	Cismontane woodland, meadows and seeps, vernal pools, valley and foothill grassland, lower montane coniferous forest. Vernal pools and swales; adobe or alkaline soils; elevation 3-1680 meters.	April - July	Low. Not observed.
Shasta snow-wreath <i>Neviusia cliffonii</i>	--/--/CRPR 1B.2	Cismontane woodland, lower montane coniferous forest, riparian woodland/often stream sides; sometimes carbonate, volcanic, or metavolcanic. Shaded, north-facing, or sheltered canyons. Sometimes on limestone. Mesic areas; elevation 300-540 meters.	April – June	Moderate. Not observed.
Slender orcutt grass <i>Orcuttia tenuis</i>	FT/SE/CRPR 1B.1	Vernal pools; often in gravelly substrate; elevation 25-1760 meters.	May – October	Low. Not observed.
Ahart's paronychia <i>Paronychia ahartii</i>	--/--/CRPR 1B.1	Cismontane woodland, valley and foothill grassland, vernal pools. Stony, nearly barren clay of swales and higher ground around vernal pools; elevation 30-510 meters.	March- June	Moderate. Known to occur within 5-miles of the Project Area. Not observed.

Appendix E-2: Special-status Plant Species with Potential to Occur in the Project Area

Species	Listing Status (Fed ESA/State ESA/Other)	Habitat Characteristics	Bloom Period	Potential Occurrence
Sierra blue grass <i>Poa sierrae</i>	--/--/CRPR 1B.3	Lower montane coniferous forest. Shady, moist, rocky slopes. Often in canyons; elevation 365-1500 meters.	April - July	Low. Not observed.
Newberry's cinquefoil <i>Potentilla newberryi</i>	--/--/CRPR 2B.3	Marshes and swamps (drying margins), vernal pools. Receding shorelines, drying wetland margins; elevation 1285-2200 meters.	May – August	Low. Not observed.
Brownish beaked-rush <i>Rhynchospora capitellata</i>	--/--/CRPR 2B.2	Lower montane coniferous forest, meadows and seeps, marshes and swamps, upper montane coniferous forest/mesic; elevation 45-2000 meters.	July – August	Low. Not observed.
Sanford's arrowhead <i>Sagittaria sanfordii</i>	--/--/CRPR 1B.2	Marshes and swamps (assorted shallow freshwater). In standing or slow-moving freshwater ponds, marshes, and ditches; elevation 0-650 meters.	May – October	Low. Not observed.
Western campion <i>Silene occidentalis</i> ssp. <i>longistipitata</i>	--/--/CRPR 1B.2	Chaparral, lower montane coniferous forest, upper montane coniferous forest; elevation 1000-2000 meters.	June – August	Moderate. Not observed.
English Peak greenbriar <i>Smilax jamesii</i>	--/--/CRPR 4.2	Broadleaved upland forest, upper and lower montane coniferous forest, marshes and swamps, North Coast coniferous forest/streambanks and lake margins sometimes mesic depressions; elevation 505-1975 meters.	May – August	Moderate. Not observed.
Marsh hedge nettle <i>Stachys pilosa</i>	--/--/CRPR 2B.3	Great Basin scrub (mesic); meadows and seeps; elevation 785-2045 meters.	June – August	Low. Not observed.
Obtuse starwort <i>Stellaria obtusa</i>	--/--/CRPR 4.3	Upper montane coniferous forest, lower montane coniferous forest, riparian woodland. Streams or seeps in conifer forest; elevation 150-2135 meters.	May – September (October)	Low. Not observed.
Siskiyou clover <i>Trifolium siskiyouense</i>	--/--/CRPR 1B.1	Meadows and seeps/mesic; elevation 880-1500 meters.	June – July	Low. Not observed.

Appendix E-2: Special-status Plant Species with Potential to Occur in the Project Area

Species	Listing Status (Fed ESA/State ESA/Other)	Habitat Characteristics	Bloom Period	Potential Occurrence
Shasta huckleberry <i>Vaccinium shastense</i> ssp. <i>shastense</i>	--/--/CRPR 1B.3	Chaparral, cismontane woodland, lower montane coniferous forest, riparian forest, subalpine coniferous forest. Acidic, mesic. Often on streambanks; sometimes on rocky outcrops, seeps, roadsides, and disturbed areas; elevation 325-1220 meters.	December – May (June – September)	Low. Not observed.
Oval-leaved viburnum <i>Viburnum ellipticum</i>	--/--/CRPR 2B.3	Chaparral, cismontane woodland, lower montane coniferous forest; elevation 215-1400 meters.	May – June	Moderate. Not observed.

Sources: CDFW 2017a, CDFW 2017c, CNPS 2017

Codes:

FT = Federally Threatened

SE = State Endangered

California Rare Plant Rank (CRPR)

CRPR 1B - Rare, threatened, or endangered in California and elsewhere

CRPR 2B - Rare, threatened, or endangered in California, but more common elsewhere

CRPR 3 - More information is needed – a review list

CRPR 4 - Plants of limited distribution – a watch list

Threat Ranks

0.1-Seriously threatened in California (over 80% of occurrences threatened / high degree and immediacy of threat)

0.2-Moderately threatened in California (20-80% occurrences threatened / moderate degree and immediacy of threat)

0.3-Not very threatened in California (less than 20% of occurrences threatened / low degree and immediacy of threat or no current threats known)