

70% Complete Draft

PRELIMINARY APPLICATION DOCUMENT (PAD)

Terrestrial Resources Sections

- *Geology and Soils (Section 5.1)*
- *Botanical (Section 5.4.1)*
- *Wildlife (Section 5.4.2)*
- *Rare, Threatened, and Endangered Species (Section 5.5)*

BISHOP CREEK HYDROELECTRIC PROJECT
FERC PROJECT NO. 1394

July 2018

5 DESCRIPTION OF EXISTING ENVIRONMENT

5.1 GEOLOGY AND SOILS

This section describes the geology and soils in the Project vicinity. FERC requirements for this section are specified in Title 18 of the CFR Chapter I § 5.6(d)(3)(ii). The FERC regulations require information on geology, topography, soils, including description of geological features, including bedrock lithology, stratigraphy, structural features, glacial features, unconsolidated deposits, mineral resources, and soils affecting the Project.

5.1.1 Bedrock Geology and Physiography

The Project is located in the Cascade-Sierra Physiographic Province (Figure 5-1). The area is characterized by large topographic relief with relative elevations ranging from over 13,000 feet above mean sea level (msl) to slightly over 4,000 feet above msl at Powerhouse No. 6. Most of the underlying bedrock is composed of Mesozoic granitic type rock that has been subjected to mechanical weathering by water and ice but largely unaffected by chemical alteration. Mechanical weathering and volcanic events have resulted in a limited variety of surficial deposits.

Figure 5-2 presents the geologic map for the project area.

The oldest exposed rocks in the area are metamorphosed remnants of a thick sequence of miogeosynclinal sediments. These sediments, typically sandstones, siltstones, shales and carbonates, were deposited along a shallow marine shelf which extended over much of the western United States during the Paleozoic. Beginning with the Mesozoic, a period of volcanism became predominant over marine sedimentation. This is evidenced by thick volcanic deposits unconformably overlying the older sequence. Although these later rocks are not preserved in the upper Bishop Creek drainage, the event is important to the area geology. At that time regional deformation began, probably contemporaneously with the volcanism, in which the Paleozoic rocks were folded, faulted and further metamorphosed.

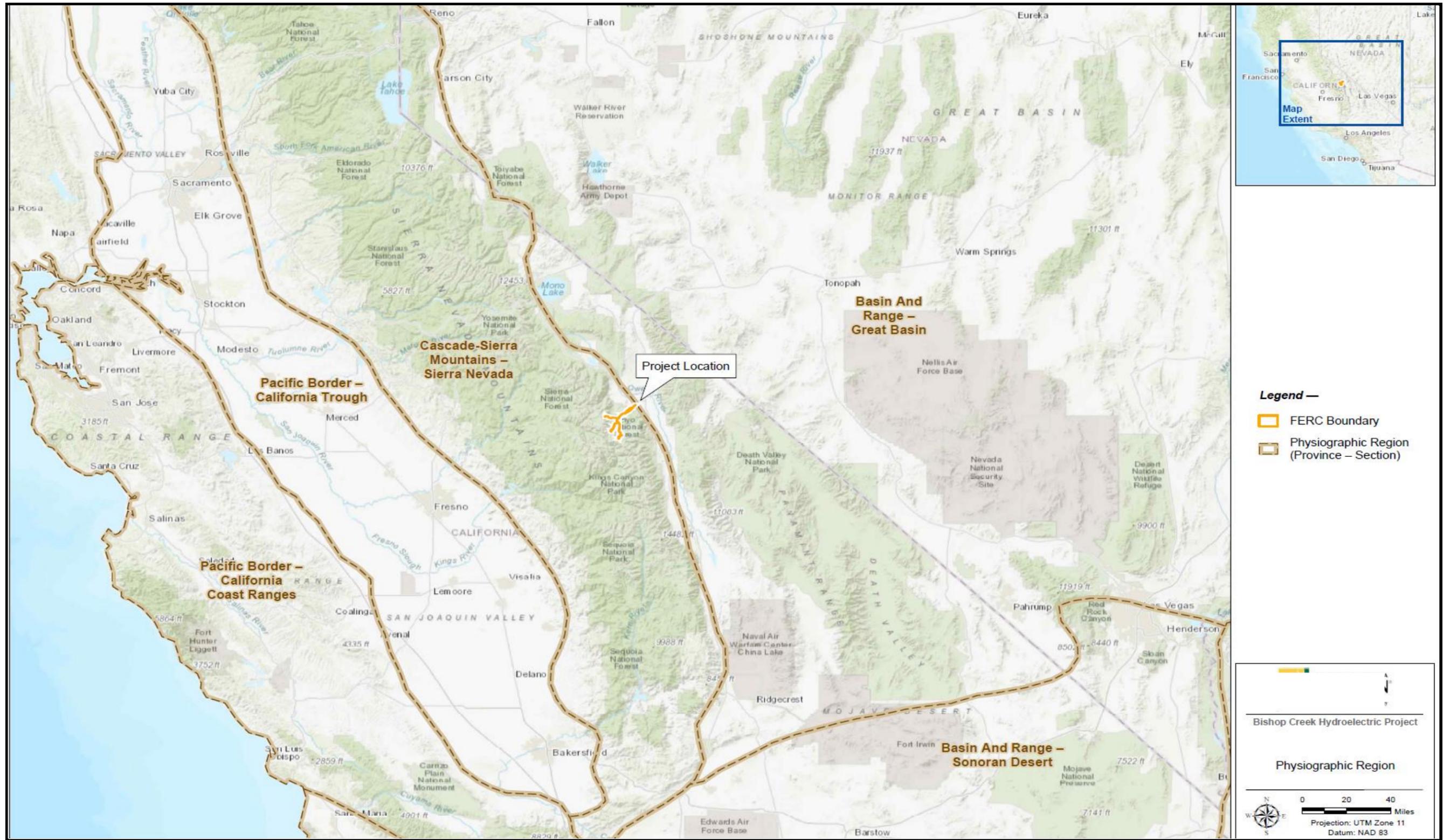


FIGURE 5-1 PHYSIOGRAPHIC REGION

By Early Cretaceous, regional deformation had ceased and the Sierra Nevada batholith was beginning to be emplaced. The batholith itself is composed of several discrete intrusive episodes, which are either in sharp contact with one another or separated by remnant metamorphic rocks. In general, the older intrusive bodies are dark, mafic rocks classified as gabbro, diorite or quartz diorite. Succeedingly younger plutons were emplaced ranging in composition from granodiorite, through quartz monzonite to alaskite.

Emplacement of the batholith was mostly by forcible intrusion, in which older rocks were displaced by and sometimes incorporated into the intruding body. After emplacement, metalliferous solutions expelled by the cooling plutons reacted with the surrounding metamorphic rocks to form contact ore bodies, many of commercial grade.

By late Cretaceous and extending into mid-Tertiary period, a broad upwarp occurred that tilted the eroded Sierra Nevada batholith to the west, forming low relief topographic arch over the present-day Owens Valley. Subsequent block faulting has raised the Sierra Valley escarpment throughout the Pleistocene to recent times. Volcanism associated with this orogeny is evidenced by cinder cones, remnant lava flows, and volcanic necks throughout the region. The topography was further modified by a series of glacial events, during which time vast ice fields extended from the ridge crest down through the major canyons, leaving U-shaped canyons, moraines and other classic glacial erosional features. That the most recent moraines are still identifiable indicates that Holocene erosion has been a minor factor since the last glaciation.

Remnant metasedimentary rocks make up one of the more striking, geological features of the Project area. The largest mass is the Bishop Creek pendant, located eastward of the Middle Fork of Bishop Creek. This roof pendant is trapped between two intrusive bodies of different ages, a relationship which is most evident in the thin septum which extends across the Middle Fork and alongside North Lake. Another thin unit, extending southeast from a younger metasedimentary sequence on Mount Humphreys, crosses over into the Project area at Mount Emerson and thins out at the North Fork of Bishop Creek.

An older unit consists of the siliceous calcic hornfels and marble of the Middle Fork septum and the bleached marble of Mount Emerson. These rocks were originally derived from a

wide spectrum of carbonate-rich sediments. The Middle Fork hornfels are commonly light to yellowish grey and very hard. Mineral content generally consists of a fine-grained quartz groundmass enclosing larger calcic-silicate minerals such as diopside or tremolite. The unit grades to marble in the lower Middle Fork section and is predominantly marble on Mount Emerson.

The marbles are generally light to medium grey, bleached white near igneous contacts. Mineral content is mostly calcite, with the more impure rocks containing quartz and various calcic-silicates. Near magmatic contacts are zones consisting mainly of garnet, pyroxene, or epidote, which, when scheelite is present locally, have created in some instances historically commercial tungsten ore deposits.

A younger unit consists of coarse grained micaceous quartzite grading to finer grained pelitic hornfels. This unit is easily identified due to the characteristic red-brown iron oxide staining of both rock masses. Derivation of such rocks was from aluminum rich shales and siltstones. Mineral contents vary, but a typical hornfel would contain feldspar and biotite, increasing in quartz content to a quartzite. Accessory minerals of both units are commonly apatite, magnetite, pyrite, and sphene.

The predominant igneous rock of the area is the Lamarck granodiorite. It was forcibly emplaced approximately 100 million years ago, tearing off and assimilating large blocks of older more mafic plutons. Sometime later, the Tungsten Hills quartz monzonite was intruded alongside the granodiorite, usually separated by remnant metamorphic rocks or mixed granitic zones. This composite batholith accounts for most of the exposed bedrock in the Project area.

The older hornblende gabbro and quartz diorite rocks, though mapped as one unit, probably represent remnants of different plutons. Hornblende gabbro is generally a medium grained, dark rock consisting of calcic plagioclase as the principal feldspar, hornblende, the principal mafic mineral, and a small percentage of quartz. Quartz diorite is a lighter rock, with slightly more sodic plagioclase, roughly equal amounts of biotite and hornblende, and some quartz. These rocks are apparent throughout the area as dark blotches enclosed by the younger, lighter intrusive rock.

The Lamarck granodiorite is most visible around Lake Sabrina as a light grey, commonly foliated, massive rock. Generally, it is medium grained, consisting of sodium rich plagioclase, approximately equal amounts of potassium feldspar and quartz, and evenly distributed hornblende and biotite.

The Tungsten Hills quartz monzonite has been altered to an albite facies over much of the Project area, visible as a light brown-orange rock. This alteration occurred adjacent to the metamorphic rocks, a possible explanation being sodic metasomatism during emplacement. The rock ranges in composition from nearly equal amounts of quartz and feldspars to a predominance of sodic plagioclase. Mafic rocks make up very little of the total composition. The albitized facies grades away from the contact into a quartz monzonite. This rock is typically medium grained, consisting of roughly equal amounts of quartz, potassium feldspar and sodic plagioclase, with some biotite.

5.1.2 Structural Features

Broad upwarping during the late Cenozoic is locally responsible for much of the present topography. The Project area is located on the northern flank of the Coyote warp, a region once eroded to grade. Increased uplift renewed deep dissection by streams as Bishop Creek. It was during this period that Pleistocene glaciation reached its peak. As a result, the valley of the North Fork, Middle Fork, and South Fork were carved out, with extensive deposits of glacial till piled up along Bishop Creek. Although mapped as one unit, these tills represent at least four advances, with each moraine stacked against the preceding one. Isolated patches of olivine basalt around North Lake and basalt boulders in older till testify to the fact that volcanism was at least contemporaneous with early uplift.

Most important to a hydrologic study of the area is the regional system of jointing in the granitic rocks. These joints are in conjugate sets, striking northwest and northeast, and dipping steeply. The joints cross intrusive contacts uninterrupted indicating that the formation of the joints came after emplacement of the batholith. Both surface and subsurface water movement is strongly influenced by this system. Notable examples include the northeast trending chasm through which Loch Leven empties, and the well-developed joints northeast of North Lake.

5.1.2.1 Glacial Features

As previously noted, the last major erosion that occurred in the area was due to glacial erosion. In most places the divide is a "knife-edged" ridge, passable on foot in only a few places. The upper slopes are largely steep-walled glacial cirques that are mantled with talus. Moraines commonly fringe the lower sides of cirque basins, and in the larger canyons extend downward to altitudes as low as 5,200 feet. Below the glaciated zone, the slopes are less precipitous but, in most places, are still steep.

The most complete representation of glacial deposits in the Project area is along Bishop Creek. Differences in the degree of dissection and in the throws along two faults that cut across the different tills on the northwest side of Bishop Creek indicate that the glacial deposits are successively younger to the southeast. Each successive glacier was southeast of its predecessor, and all the morainal ridges on the northwest side of Bishop Creek are lateral moraines that were deposited along the northwest sides of these glaciers (Bateman, 1965).

Mineral Resources

The contact metasomatic, scheelite bearing tungsten deposits contain the principal ores of the Bishop district. At the end of 1953, Bateman (1965) reported that the mines in the Bishop area, that includes Bishop Creek, produced approximately 1.3 million short-ton units of tungsten trioxide (WO_3). Most of these deposits are located outside the Bishop Creek watershed but on the south fork of Bishop Creek, which contains many metamorphic inclusions, are the only ones in which notable amounts of scheelite-bearing tactite has been found.

The Schober mine was located on the east side of the South Fork of Bishop Creek. The deposit was discovered in late 1940 and placed in operation from 1942 to 1943. In 1943, the ore body was exhausted and, after exploration at depth failed to reveal additional ore, the mine was shut down. In addition, several prospects were noted in the Coyote Creek drainage and the South Fork of Bishop Creek.

Bateman (1956) also reported that gold was mined from the Cardinal Mine located approximately 1 mile south of Lake Sabrina at an elevation of 8,700 feet. The mine was

operated from 1911 to 1922 and 1934 to 1938. The amount of gold, silver and copper mined was not reported. The mine opening collapsed, and no activity has occurred since 1938.

5.1.3 Soil Types in Project Area

The U.S. Department of Agriculture (1995) divided the soil types occurring in the general area of the Project into various regimes. Of the total of four regimes identified for the Inyo National Forest, three were located beneath or immediately adjacent to the Project facilities (Figure 5-3). They included the following major soil regimes.

5.1.3.1 Soils in the Mesic Soil Temperature Regime

In the Mesic soil temperature regime, the mean annual soil temperature is 47°F to 59°F. The soils in this group are widely distributed throughout the survey area. The soils in this group are found in material that weathered from granitic, basalt, metamorphic rocks, pumice and tuff. The elevation ranges from 4,300 feet to 9,600 feet. The soils are found on mountainsides, hillsides, valley bottoms, lake terraces, fan terraces, moraines, ridges and colluvial slopes; slopes range from 0 percent to 90 percent. Annual precipitation ranges from 4 inches to 30 inches. The soils in this group are shallow to very deep and are well to excessively drained

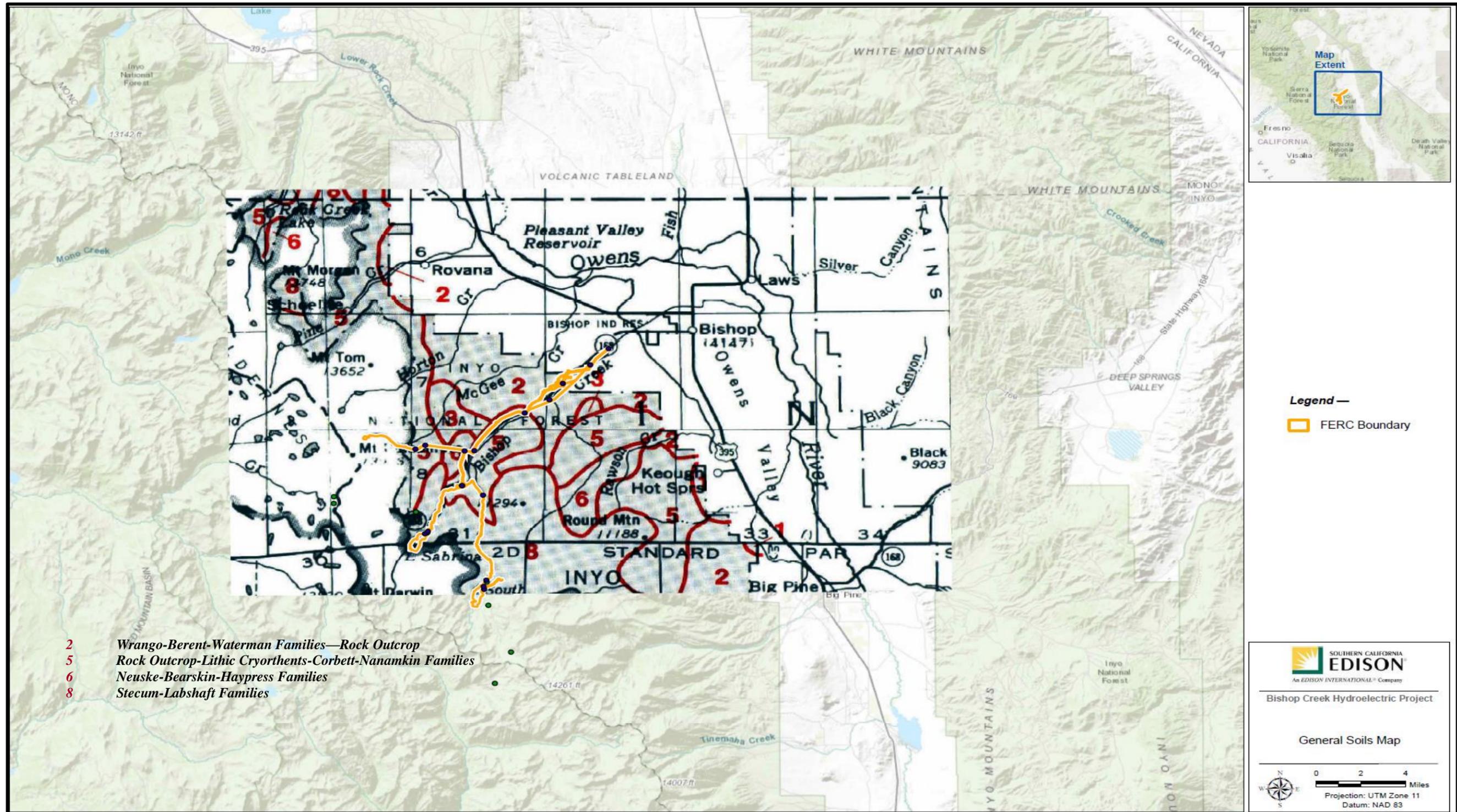


FIGURE 5-3 GENERAL SOILS MAP

Wrango-Berent-Waterman Families—Rock Outcrop (2)

The soils in this map unit formed in material that weathered from granitic rock. These soils are found on mountainsides, hillsides, lake terraces, moraines, ridges and colluvial slopes of slopes of 0 to 90 percent.

5.1.3.2 Soils in the Frigid Soil Temperature Regime

The soils in this group formed in material that weathered from granitic, basalt, metamorphic rocks, pumice, ash and tuff. The elevation ranges from 5,000 feet to 13,000 feet that produce frigid soil temperatures with an annual mean soil temperature of 32°F to 47°F. The soils are on mountainsides, hillsides, basalt flows, mountain toes, moraines, hilltops, ridges and colluvial slopes. Slopes range from 0 percent to 90 percent. Annual precipitation ranges from 8 inches to 45 inches. The soils in this group are shallow to very deep and are well drained to excessively drained.

Rock Outcrop-Lithic Cryorthents-Corbett-Nanamkin Families (5)

The soils in this map unit were in material that weathered from mixed granitic, rhyolitic and andesitic rocks. These soils are found on mountainsides, ridges and colluvial slopes of slopes of 0 percent to 90 percent.

Neuske-Bearskin-Haypress Families (6)

The soils in this map unit were formed in material that weathered from granitic, basalt, metasedimentary and mixed rock. These soils are found on hillsides, basalt flows, mountain toes and mountainsides, on slopes of 0 percent to 90 percent.

5.1.3.3 Soils in the Cryic Soil Temperature Regime

In the cryic soil temperature regime, the mean annual soil temperature is 32 to 47°F. The mean annual summer soil temperature is lower than 47°F if a thin layer is present, and the soil is not saturated during some portion of the summer and 59°F if a thin layer is not present.

Conversely, if the soil is saturated for a portion of the summer, then the soil temperature must be lower than 43°F if a thin layer is present and 55°F if it is not present.

The soils in this group were formed in material that weathered from granitic, basalt, metamorphic rocks, pumice, rhyolite, obsidian and ash. The elevation ranges from 7,400 feet to 13,400 feet. These soils are found on mountainsides, hillsides, mountaintops, hilltops, terraces, and mountain basin; slopes range from 0 percent to 70 percent. Annual precipitation ranges from 12 to 45 inches.

Stecum-Labshaft Families (8)

The soils in this map unit were formed in material that weathered from granitic, metavolcanic, metasedimentary and mixed rocks. These soils are found on mountainsides, mountain tops, moraines and terraces of slopes of 0 percent to 70 percent.

5.1.4 Soil Characteristics

Shallow soils are defined as soils less than 20 inches deep (Soil Survey Division Staff 1993) and are sensitive because they are susceptible to erosion. These soils are generally weakly developed, with relatively little organic matter, and therefore have low nutrient levels. Any soil displacement or loss can affect their productivity. When soil is shallow, runoff can infiltrate to the bedrock layer and run along that layer, carrying the overlying shallow soil with it. Shallow soils are found throughout the forest, on most sites. These soils are most common in steeper areas, high elevation areas, and areas of recent geologic deposition, such as volcanic deposits. Forest coverage illustrates that shallow soils are most common, predictably, in rocky areas of the forest, and almost the entire White and Inyo Mountains (USFS, undated).

Most soils in the Project area include a variety of soils with varying characteristics.

Table 5-1 presents a summary of the typical soils underlying the Project area. Figure 5-4

Figure 5-8 presents the various mapped soil units in the Project area.

TABLE 5-1 SOIL TYPES AND CHARACTERISTICS BENEATH AND ADJACENT TO THE BISHOP CREEK PROJECT FACILITIES

| MAP SYMBOL (a) | NAME | SLOPE (%) | AVAILABLE WATER CAP. (inches) | PERMEABILITY (in/hr) | MAX. EROSION HAZARD | EROSION FACTOR (K) (b) | SOIL PRODUCTIVITY |
|----------------|---|-----------|-------------------------------|----------------------|-----------------------|------------------------|-------------------|
| 105 | Typic Cryorthents | 0-35 | NR (c) | Mod. (d) High (NR) | Mod.-High | 0.24 | NR |
| 107 | Typic Cryorthents | 50-85 | NR | Mod. High (NR) | Very High | 0.24 | NR |
| 111 | Typic Cryorthents-Typic Cryochrepts-Rock Outcrop Complex | 0-45 | NR | Mod. High-High (NR) | Mod.-High | 0.24-0.37 | NR |
| 117 | RockOutcrop - Rubbleland Complex | 20-60 | NA (e) | NA | NA | NA | NA |
| 125 | Bairs-Kilburn Family | 8-30 | Moderate | Rapid (6-20) | Mod.-High | 0.10 | NR |
| 129 | Berent-Glenbrook-Nanamkin Families | 30-50 | NR | Rapid (6-20) | NR | 0.15 | NR |
| 147 | Rock Outcrop – Typic Cryorthents Complex | 0-45 | NR | Mod. High (NR) | Mod.-High | 0.24 | NR |
| 148 | Rock Outcrop-Typic Cryorthents Complex | 40-85 | NR | Mod. High (NR) | Very High | NR | NR |
| 152 | Cartago Gravelly Loamy Coarse Land | 5-30 | NR | NR | NR | 0.15 | NR |
| 154 | Cartago Gravelly Loamy Sand | 0-2 | NR | NR | NR | 0.24 | NR |
| 170 | Conway-Conway Cobbly-Chesaw Family | 0-15 | Low-Mod. | Mod. Rapid (NR) | Slight | 0.15 | Low-Mod. |
| 196 | Goodale Loamy Coarse Sand | 5-15 | Very Low | Rapid (NR) | Slight | 0.15 | NR |
| 199 | Goodale-Cartago Complex | 2-5 | Very Low | Rapid (NR) | Slight | 0.02-0.15 | NR |
| 200 | Goodale-Cartago Complex | 5-15 | Very Low | Rapid (NR) | Slight | 0.10-0.15 | NR |
| 201 | Goodale-Cartago Complex | 2-5 | Very Low | Rapid (NR) | Slight | 0.02-0.15 | NR |
| 222 | Inyo Sand | 9-15 | Very Low | Rapid (NR) | Moderate | 0.17 | NR |
| 226 | Kilburn Family-Watterson Association | 4-15 | Very Low | Mod. Rapid (NR) | Moderate | 0.05-0.15 | NR |
| 227 | Kilburn Family-Watterson Wet Association | 4-30 | Very Low to Low | Mod. Rapid (NR) | Moderate | 0.05-0.15 | NR |
| 231, 232 | Lithic Torriorthents-Lithic Haplargids-Rock Outcrop Complex | 30-75 | Very Low | Rapid (NR) | Severe to Very Severe | 0.10-0.24 | NR |

| MAP SYMBOL (a) | NAME | SLOPE (%) | AVAILABLE WATER CAP. (inches) | PERMEABILITY (in/hr) | MAX. EROSION HAZARD | EROSION FACTOR (K) (b) | SOIL PRODUCTIVITY |
|--|-------------------------------|-----------|-------------------------------|----------------------|---------------------|------------------------|-------------------|
| 244 | Lubkin-Tinemaha Complex, | 5-15 | Very Low to Low | Mod. Rapid (NR) | Moderate | 0.10-0.15 | NR |
| 247 | Lucerne Gravelly Loamy Sand | 2-5 | Low | Mod. Rapid (NR) | Moderate | 0.10-0.15 | NR |
| 313 | Wrango - Atter Families | 60-90 | Very Low | Rapid (6-20) | High to Very High | 0.10-0.15 | Low-Mod. |
| 320 | Waterman - Sur Families | 30-60 | Very Low | Rapid (6-20) | Mod. to High | 0.05-0.10 | Very Low |
| 330 | Wrango Family | 30-60 | Very Low | Rapid (6-20) | Mod. to High | 0.15-0.22 | Low-Mod. |
| 340 | Ulymeyer-Rovana Complex | 5-15 | Very Low | Rapid (NR) | Slight | 0.10-0.15 | NR |
| 347 | Nanamkin Family | 15-60 | Very Low | Rapid (6-20) | Low-High | 0.05 | Low |
| 355 | Kilburn - Nanamkin Families | 5-15 | Low | Mod. Rapid (2-6) | Low | 0.15 | Low-Mod. |
| 359 | Rock outcrop - Powment Family | 30-60 | Very Low | Rapid (6-20) | Mod.-High | 0.10 | Low |
| 361 | Wrango - Berent Families | 2-30 | Very Low | Rapid (6-20) | Low-Mod. | 0.15 | Low |
| 364 | Preston Family, Rock Outcrop | 30-60 | Low | Rapid (6-20) | Mod.-High | 0.22 | Low-Mod. |
| 366 | Stecum Family | 2-30 | Very Low | Rapid (6-20) | Low-Mod. | 0.10 | Low |
| 367 | Stecum Family | 30-60 | Very Low | Rapid (6-20) | Mod.-High | 0.10 | Low |
| 368 | Bearskin - Mascamp Families | 15-30 | Very Low | Mod. Rapid (2-6) | Low-Mod. | 0.17 | Low-Mod. |
| 369 | Xeric Haplodurids | 2-9 | Very Low | Rapid (NR) | Slight | 0.15 | NR |
| 370 | Xerofluvents | 0-5 | Low to Mod. | Mod. Slow (NR) | Slight | 0.05-0.17 | NR |
| 402 | Bairs Family | 15-50 | Low | Mod. (0.6-2) | Low-High | 0.10 | Low-Mod. |
| 406 | Artray - Chesaw Families | 0-5 | Moderate | Mod. (0.6-2) | Low | 0.24 | Mod.-High |
| 413 | Wrango - Pizona Families | 5-30 | Very Low | Rapid (6-20) | Low-Mod. | 0.15 | Low-Mod. |
| Notes: a – See Figure 5-4 through 5-8 b – Does not apply to rock outcrops c – NR=Not reported d – Mod.=Moderate e – NA=Not Applicable | | | | | | | |

Source: U.S. Department of Agriculture, 1996, 1995a and 1995b.

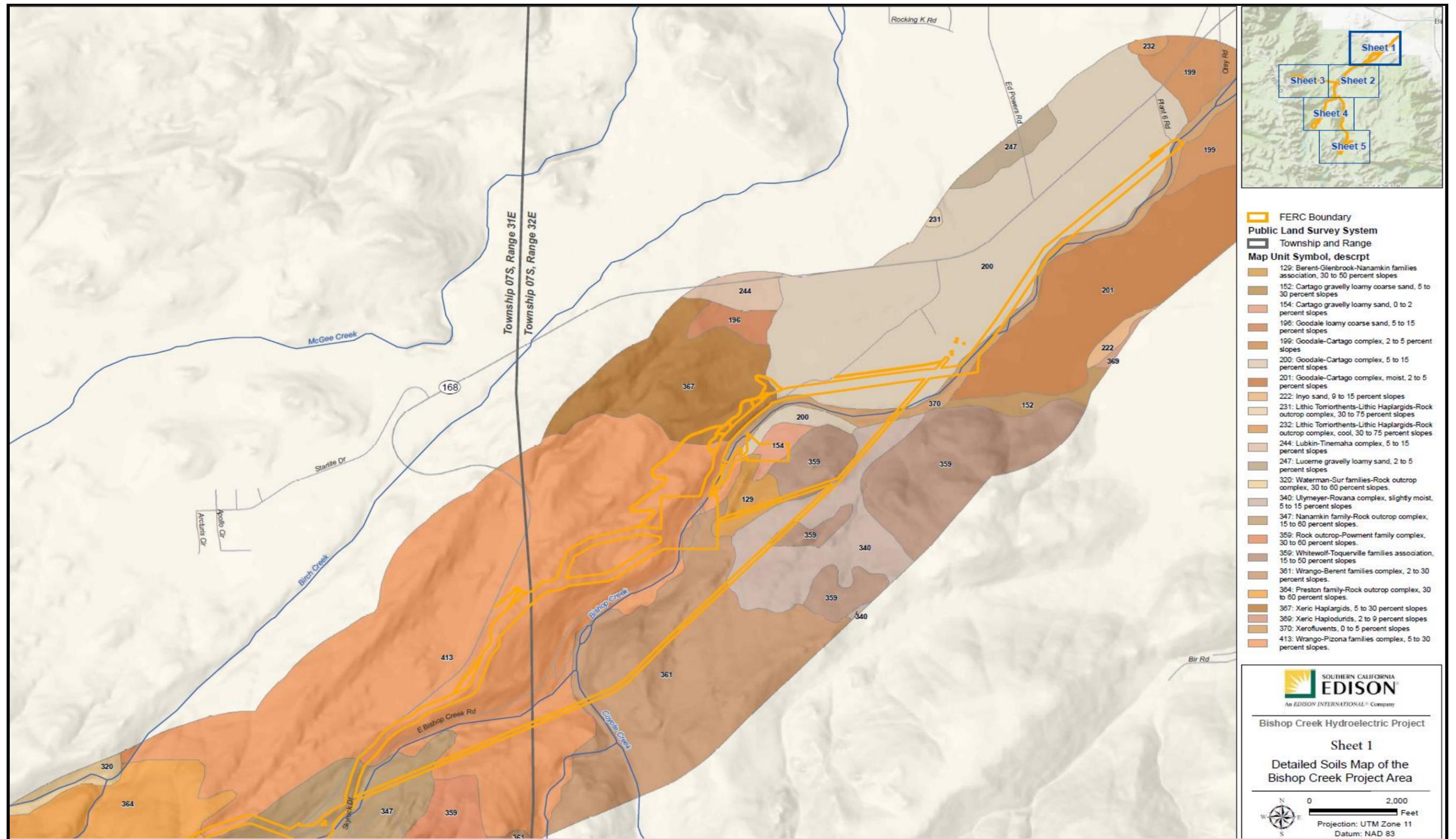


FIGURE 5-4 DETAILED SOILS MAP OF THE BISHOP CREEK PROJECT AREA – SHEET 1

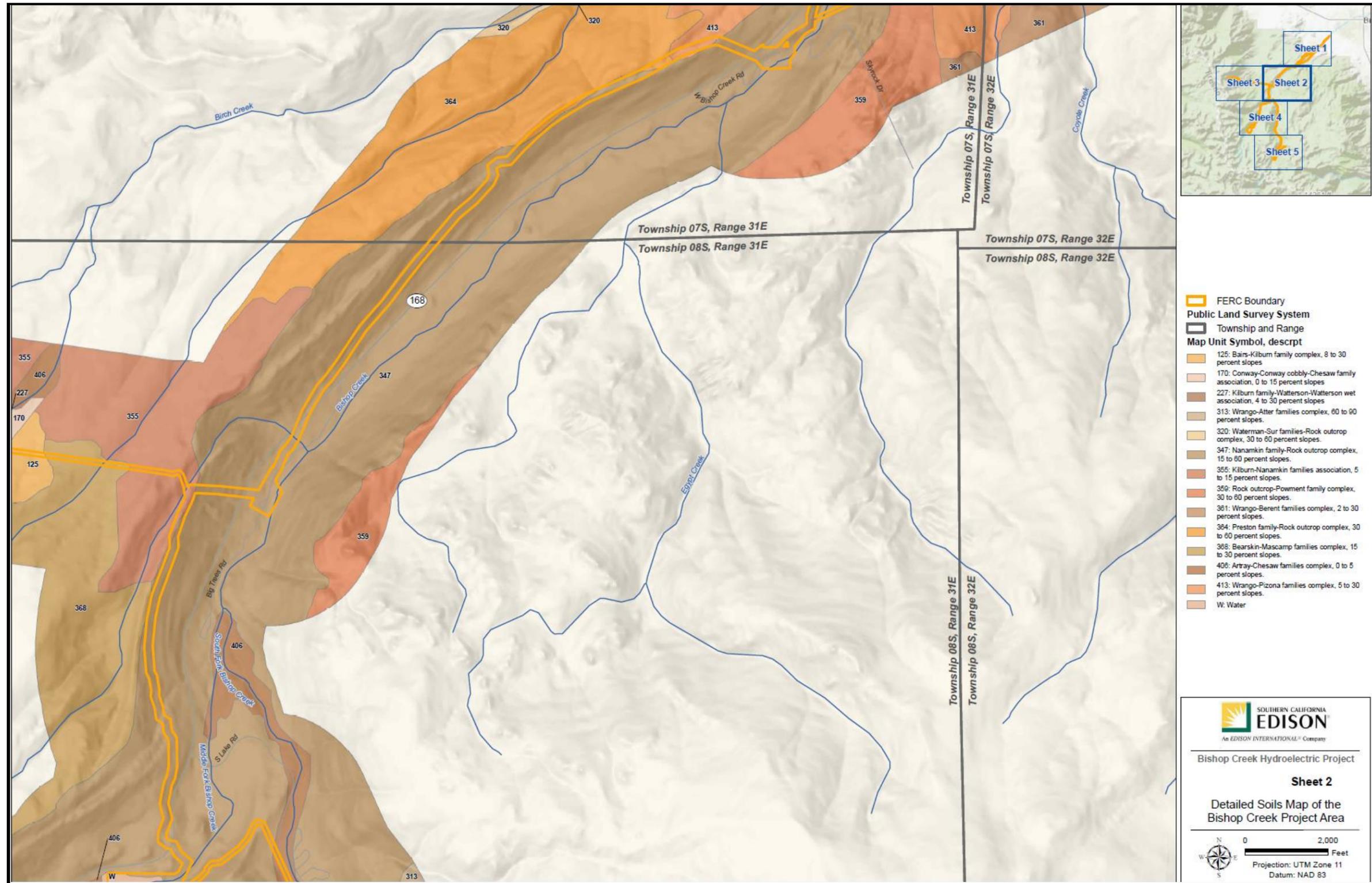


FIGURE 5-5 DETAILED SOILS MAP OF THE BISHOP CREEK PROJECT AREA - SHEET 2

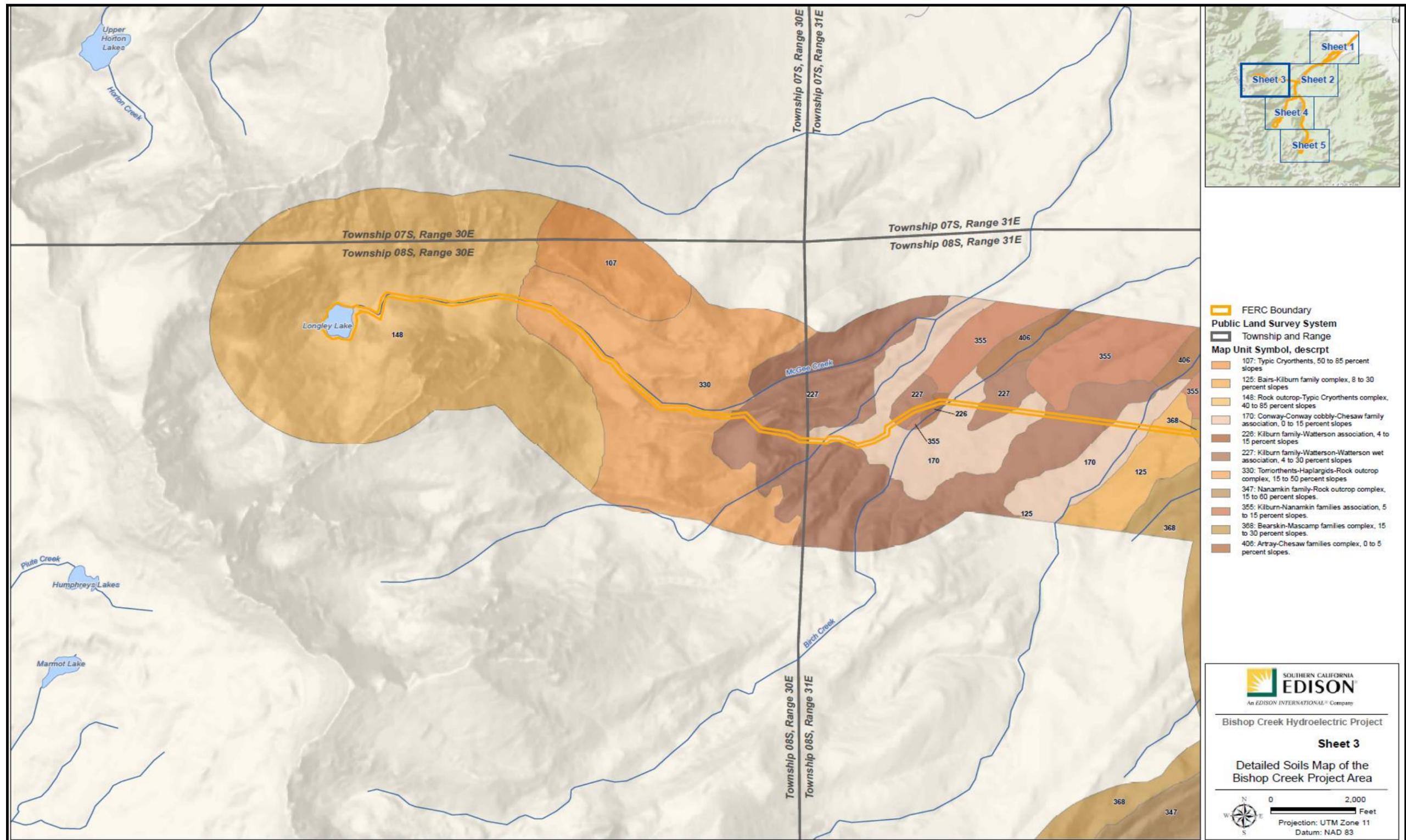


FIGURE 5-6 DETAILED SOILS MAP OF THE BISHOP CREEK PROJECT AREA - SHEET 3

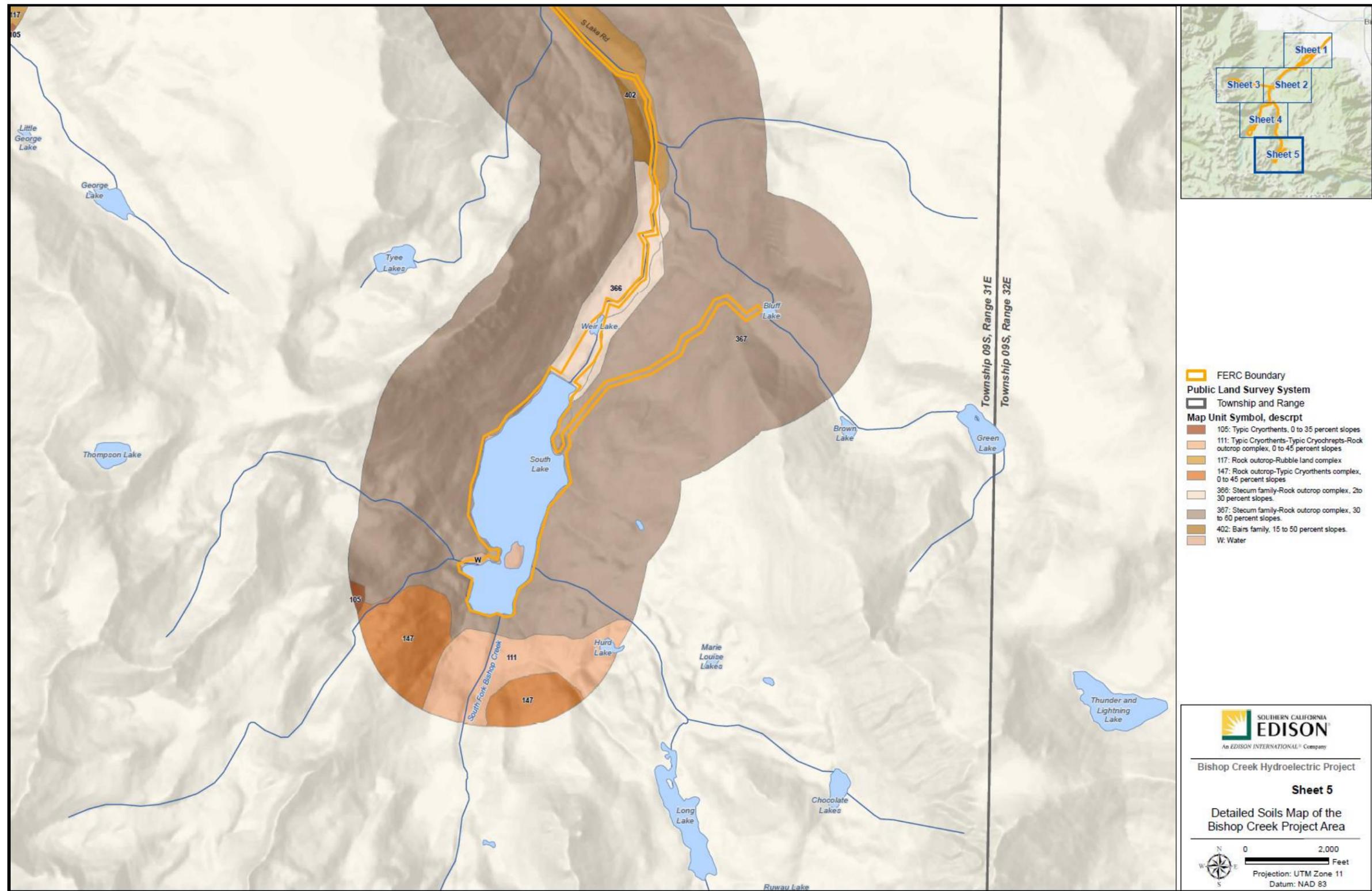


FIGURE 5-8 DETAILED SOILS MAP OF THE BISHOP CREEK PROJECT AREA - SHEET 5

5.1.1 References

- Bateman, P.C. 1987. Pre-tertiary Bedrock Geologic Map of the Mariposa 1 degree by 2 degree quadrangle. California. U.S. Geological Survey Open File Report 87-670.
- Bateman, P.C. 1988. Constitution and Genesis of the Central Part of the Sierra Nevada Batholith, California. U.S. Geological Survey Open File Report 88-382.
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5.4 TERRESTRIAL BOTANICAL AND WILDLIFE RESOURCES

This section describes terrestrial botanical and wildlife resources in the vicinity of the Bishop Creek Hydroelectric Project (Project).

5.4.1 Botanical Resources

This section describes botanical resources in the Project vicinity including vegetation communities and common plants, special-status plants, and non-native invasive plants.

5.4.1.1 Vegetation Communities and Common Plants

Botanical resources described herein are based on direct observation from previously conducted field surveys and license-required monitoring studies. Classification of plant communities is based on the current classification system used widely throughout California (Sawyer et al. 2009) with modifications based on observed site conditions. For example, the Sawyer et al. (2009) system is based on species dominance in fully mature (climax) communities. However, across much of the Project vicinity, natural disturbances such as fire and scouring stream flows result in changes in community composition. Consequently, much of the vegetation consists of mixed assemblages with indistinct boundaries, such as wet meadow occurring in the understory of a Jeffrey pine or riparian forest.

5.4.1.2 Upland Habitat Communities and Species

Big Sagebrush Scrub

Big Sagebrush Scrub (*Artemisia tridentata* Shrubland Alliance) occurs on steep hills and plains surrounding most of the Project facilities, access roads and riparian communities, generally below 9,000 feet. In addition to big sagebrush, characteristic shrub species include rubber rabbitbrush (*Ericameria nauseosus*), bitterbrush (*Purshia tridentata*), ephedra (*Ephedra nevadensis*, *E. viridis*), and shadscale saltbush (*Atriplex confertifolia*). Conifers such as Jeffrey pines (*Pinus jeffreyi*) and singleleaf pinyon (*Pinus monophylla*) also occur in this community.

Single-Leaf Pinyon Woodland

Single-Leaf Pinyon Woodland (*Pinus monophylla* Woodland Alliance) consists of sparse, widely spaced stands of singleleaf pinyon trees on steep slopes, generally between 3,000 and 9,000 feet above MSL. This community intergrades with big sagebrush scrub and riparian communities. Other characteristic species include Jeffrey pine, rubber rabbitbrush, bitterbrush, and gray horse-brush (*Tetradymia canescens*).

Jeffrey Pine Forest

The Jeffrey Pine Forest (*Pinus jeffreyi* Forest Alliance) occurs primarily above Plant 4 along Bishop Creek and adjacent slopes. Below Plant 4, Jeffrey pines occur as scattered individuals confined to stream reaches. In addition to Jeffrey pines, common species associated with this community in upland areas include lodgepole pine (*Pinus contorta* ssp. *murrayana*), big sagebrush, rubber rabbitbrush, and bitterbrush.

5.4.1.3 Riparian and Wetland Plant Communities and Species

Aspen Groves

Aspen Groves (*Populus tremuloides* Forest Alliance) occur on slopes above stream reaches in the Project vicinity, generally associated with freshwater springs and seeps. The most extensive groves of these winter-deciduous trees occur in the watersheds of Birch and McGee creeks above the diversions.

Water Birch Thickets

Water Birch Thickets (*Betula occidentalis* Shrubland Alliance) occur on the banks of Bishop, Birch and McGee creeks in association with perennial flow. Water birch was scarce between Plants 4 and 5 on Bishop Creek, and on McGee Creek below the diversion, until instream flow releases in the summer months began as a requirement of the existing license.

Mixed Willow and Cottonwood Riparian Forest

Mixed stands of willows (*Salix* spp.) and cottonwoods (*Populus* spp.) occur on most stream reaches in the Project vicinity, especially Bishop Creek reaches where high groundwater contributes to surface flow (often referred to as "gaining" reaches). These reaches are above Plant 4 and on lower Bishop Creek by Plant 6.

Freshwater Marsh and Meadow

Freshwater marsh and meadow communities occur as small stands along stream banks, on bars within the streams, freshwater seeps, and lake margins. Species include cattail (*Typha domingensis*), horsetail (*Equisetum* spp.), rushes (*Juncus* spp.) and sedges (*Cyperus* spp.) along with mesic-adapted grasses such as tufted hairgrass (*Deschampsia cespitosa*). Where these small communities occur along edges of streambanks, they can be vulnerable to loss from high scouring flows.

There are generally no regulatory protections associated with plant communities. However, riparian habitats are afforded protections under CDFW Sections 1600–1607 and under Section 404 of the CWA (under the jurisdiction of the U.S. Army Corps of Engineers [USACE]).

5.4.1.4 Special-Status Plants

This section describes special-status plants that are known to occur or may potentially occur in the Project vicinity. Threatened and Endangered Plants are discussed in Section 5.7.

For the purposes of this document, a special-status plant is defined as a plant species considered by one or more branches of the federal government (such as the U.S. Department of Agriculture [USDA], USFS, or the U.S. Department of Interior [DOI] BLM) or by the state of California to merit regulatory consideration in association with prosecution of a Project. The state of California classifies such plant species as California Species of Special Concern (CSC), and will also employ the California Native Plant Society (CNPS) California Rare Plant Rank (CRPR), a ranking system for rare, threatened, or endangered plants in

California. The California Environmental Quality Act (CEQA) requires consideration of plant species with the following CRPR rankings:

- 1A presumed extirpated in California and either rare or extinct elsewhere;
- 1B rare, threatened, or endangered in California and elsewhere;
- 2A presumed extirpated in California, but common elsewhere; and
- 2B rare, threatened, or endangered in California, but common elsewhere.

CRPR also employs a Threat Rank extension that further clarifies the level of endangerment of a plant species.

- An extension of **.1** is assigned to plants that are considered “seriously threatened” in California (*i.e.*, over 80 percent of known occurrences are threatened or have a high degree and immediacy of threat).
- Extension **.2** indicates the plant is “fairly threatened” in California (*i.e.*, between 20 and 80 percent of the occurrences are threatened or have a moderate degree and immediacy of threat).
- Extension **.3** is assigned to plants that are considered “not very threatened” in California (*i.e.*, less than 20 percent of occurrences are threatened or have a low degree and immediacy of threat or no current threats are known).
- The absence of a threat code extension indicates that this information is lacking for the plant(s) in question.

A list of special-status plant species was compiled from the following sources:

- The CNDDDB (CDFW 2018a) and the CNPS Inventory of Rare, Threatened and Endangered Plants (CNPS 2018). The following USGS 7.5-minute topographic quadrangles were queried for special status plant species: Coyote Flat, North Palisade, Tungsten Hills, Mt. Darwin, Mount Tom, Bishop, and Mt. Goddard.

This resulting list was then evaluated to determine which plant species have the potential to occur or are known to occur in the Project vicinity based a review of the following:

- Supplemental information (*e.g.*, habitat descriptions and known occurrences) obtained from a review of the following Project-specific sources:
 - Psomas Biological Survey Reports (a total of 14 reports prepared for SCE between 2004 and 2014)
 - Environmental Assessment, Bishop Creek Project (FERC Project No. 1394-004) (FERC 1991)

- Plant species on the list were then categorized as follows:
 - **Known to occur in the Project vicinity:** Special-status plants with recorded populations in the Project vicinity, as determined by CNDDDB or SCE studies;
 - **May potentially occur in the Project vicinity:** Special-status plants that may potentially occur in the Project vicinity based on the geographic location and elevation of the Project and vegetation alliances and other habitat features present; and
 - **Unlikely to occur in the Project vicinity:** Special-status plants that are unlikely to occur because their range does not overlap the Project; or for which the Project vicinity does not support appropriate habitat.

Table 5-38 provides a list of special-status plant species evaluated for their potential to occur in the Project vicinity. Species listed in the table are categorized as known to occur; may potentially occur, or unlikely to occur. Table 5-38 also summarizes pertinent information for each species, including status, blooming period, and preferred habitat, with information on the location of occurrences, if applicable.

Figure 5-18, Plant CNDDDB Records in the Project Vicinity, shows known occurrences based on the results of the CNDDDB query.

TABLE 5-38 SPECIES OCCURRENCE

| SCIENTIFIC/ COMMON NAME | FEDERAL STATUS | STATE STATUS AND CRPR RANK | BLOOMING PERIOD/ FERTILE | HABITAT | LIKELIHOOD FOR OCCURRENCE/OCCURRENCE NOTES |
|--|-------------------|--|--------------------------------|---|--|
| KNOWN TO OCCUR | | | | | |
| <i>Draba praealta</i> tall draba | – | CRPR 2B.3 | July–Aug | Meadows, seeps, and wetlands from 9,596 ft. to 11,302 ft. | Known to occur. This species is located along Lake Sabrina, south of Lake Sabrina Dam. |
| <i>Mentzelia inyoensis</i> Inyo blazing star | BLMS, USFS_S | CRPR 1B.3 | Apr–Oct | Great Basin scrub, pinyon-juniper woodland from 3,789 ft. to 6,496 ft. | Known to occur. This species is located along Bishop Creek, 0.4 miles north of Bishop Creek South Fork Diversion Dam. |
| <i>Myurella julacea</i> small mousetail moss | – | CRPR 2B.3 | N.A. | Alpine boulder and rock field, subalpine coniferous forest, growing on damp limestone rock and soil; crevices, under hangs, shelves, in filtered light; sometimes on granite, from 8,858 ft. to 9,842 ft. | Known to occur. This species is located along Middle Fork Bishop Creek 0.6 miles northeast of Lake Sabrina Dam. |
| <i>Solorina spongiosa</i> fringed chocolate chip lichen | – | CRPR 2B.2 | N.A. | Meadows and seeps, including seeps within subalpine coniferous forest, on moss mats in areas with calcareous seepage. Generally, in high altitude sites with north or east exposure, from 9,498 ft. | Known to occur. This species is located 0.5 miles north of South Lake Dam, along South Lake Road within South Fork Bishop Creek Drainage. |
| <i>Trichophorum pumilum</i> little bulrush | – | CRPR 2B.2 | Aug | Limestone soils within bogs and fens, marshes and swamps, and riparian scrub from 9,448 ft. to 10,662 ft. | Known to occur. This species is located 0.5 miles north of South Lake Dam, along South Lake Road within South Fork Bishop Creek Drainage. |
| <i>Triglochin palustris</i> marsh arrow-grass | – | CRPR 2B.3 | July–Aug | Meadows and seeps, freshwater marsh, subalpine coniferous forest from 6,988 ft. to 11,597 ft. | Known to occur. This species is located 0.8 miles southwest of Bishop Creek Intake No. 2, 0.15 miles east of Highway 168. |
| MAY POTENTIALLY OCCUR | | | | | |
| <i>Allium atrorubens</i> var. <i>atorubens</i> Great Basin onion | – | CRPR 2B.3 | May–Jun | In sandy, rocky, gravelly, or sometimes clay soils in Great Basin scrub and pinyon-juniper woodland from 3,937 ft. to 3,937 ft. | May potentially occur. This species has been recorded outside the project boundary, 2.2 miles north of Birch Creek Diversion, on McGee Creek. |
| <i>Boechea dispar</i> pinyon rock cress | – | CRPR 2B.3 | Mar–Jun | Granitic, gravelly slopes and mesas in Joshua tree woodland, pinyon and juniper woodland, and Mojavean desert scrub from 3,297 ft. and 9,202 ft. | May potentially occur. This species has been recorded outside the project watershed, 1.5 miles southeast of Powerhouse No. 4, east of Coyote Creek. |
| <i>Boechea tularensis</i> Tulare rockcress | USFS_S | CRPR 1B.3 | Jun–Jul | Rocky slopes in Subalpine coniferous forest, upper montane coniferous forest from 5,987ft. to 11,007 ft. | May potentially occur. This species has been recorded 3.3 miles to the west of the project watershed’s western boundary, 6 miles west of Lake Sabrina. |
| <i>Botrychium crenulatum</i> scalloped moonwort | USFS_S | CRPR 2B.2 | Jun–Sept | Moist meadows and seeps, upper montane coniferous forest, lower montane coniferous forest, marshes and swamps from 3,887 ft. to 10,203 ft. | May potentially occur. This species has been recorded within the project watershed boundary, 4.3 miles east of South Fork Bishop Creek and 4.8 miles southeast of Bishop Creek South Fork Diversion Dam, along the East Fork Coyote Creek. |
| <i>Bruchia bolanderi</i> Bolander’s bruchia | USFS_S | CRPR 4.2 | N.A. | Moss which grows on damp clay soils in lower montane coniferous forest, meadows and seeps, and upper montane coniferous forest; ephemeral nature and disturbance adapted; from 5,282ft. to 10,958 ft. | May potentially occur. This species has been recorded 2 miles south of the project watershed’s southern boundary, 5.5 miles south of South Lake. |
| <i>Calochortus excavatus</i> | BLMS, USFS_S | CRPR 1B.1 | Apr–Jul | Mostly on fine, sandy loam soils with alkaline salts; grassy meadows and | May potentially occur. This species has been recorded outside the project’s northeastern watershed boundary, 2.9 |

| SCIENTIFIC/ COMMON NAME | FEDERAL STATUS | STATE STATUS AND CRPR RANK | BLOOMING PERIOD/ FERTILE | HABITAT | LIKELIHOOD FOR OCCURRENCE/ OCCURRENCE NOTES |
|---|-------------------|--|--------------------------------|--|---|
| Inyo County star-tulip | | | | seeps in shadscale scrub from 393 ft. to 7,201 ft. | miles northeast of Powerhouse No. 6 off Highway 168 in Bishop. |
| <i>Carex scirpoidea</i> ssp. <i>pseudoscirpoidea</i> western single-spiked sedge | | CRPR 2B.2 | Jul–Sept | Often on limestone in alpine boulder and rock field, meadows and seeps, and subalpine coniferous forest from 6,988 ft. to 12,007 ft. | May potentially occur. This species has been recorded within the project watershed boundary, 4 miles east of Bishop Creek South Fork Diversion Dam, along West Fork Coyote Creek. |
| <i>Helodium blandowii</i> Blandow's bog moss | USFS_S | CRPR 2B.3 | N.A. | Moss growing on damp soil, especially under willows among leaf litter in meadows, seeps, and subalpine coniferous forest from 6,108 ft. to 8,858 ft. | May potentially occur. This species has been recorded 1.3 miles south of the project watershed southern boundary, 3.6 miles south of South Lake Dam, along Middle Fork Kings River. |
| <i>Lupinus magnificus</i> var. <i>hesperius</i> Mcgee Meadows lupine | BLMS | CRPR 1B.3 | Apr–Jun | Sandy substrates in Great Basin scrub and upper montane coniferous forest from 5,298 ft. to 7,103 ft. | May potentially occur. This species was last recorded in 1906, 1 mile west of the project watershed's western boundary, 1.6 miles northwest of Powerhouse No. 3 and Intake No. 4, and 2 miles west of Powerhouse No. 4 and Intake No. 5, near McGee Meadow. |
| <i>Packera indecora</i> rayless mountain ragwort | | CRPR 2B.2 | Jul–Aug | Mesic meadows and seeps from 5,593 ft. to 10,006 ft. | May potentially occur. This species has been recorded 3.7 miles west of the project watershed's western boundary, 6.3 miles west of Lake Sabrina. |
| <i>Parnassia parviflora</i> small-flowered grass-of-Parnassus | | CRPR 2B.2 | Aug–Sept | Wet areas, meadows and rocky seeps from 6,594 ft. to 9,104 ft. | May potentially occur. This species was last recorded in 1937 in Buttermilk County, outside the project watershed's northern boundary, 1.9 miles north of Birch Creek Diversion. |
| <i>Plagiobothrys parishii</i> Parish's popcornflower | | CRPR 1B.1 | Mar–Jun | Alkaline soils; mesic sites in Great Basin scrub and Joshua tree woodland from 8,070.8 ft. to 15,068.8 ft. | May potentially occur. This species was last recorded in 1913 outside the project watershed's northern boundary, located in a meadow along Highway 395 approximately 1.5 miles east of Bishop. |
| <i>Potamogeton robbinsii</i> Robbins' pondweed | | CRPR 2B.3 | Jul–Aug | Deep water, lakes, marshes and swamps from 5,003 ft. to 11,466 ft. | May potentially occur. This species has been recorded 1.7 miles southeast of the project watershed's eastern boundary, 4.6 miles southeast of South Lake Dam, along Fourth Lake. |
| <i>Ranunculus hydrocharoides</i> frog's-bit buttercup | | CRPR 2B.1 | Jun–Sept | In or bordering shallow springs or freshwater marshes and seeps from 4,133 ft. to 7,611 ft. | May potentially occur. This species has been recorded outside the project watershed's northern boundary, 3.5 miles of Powerhouse No. 6, located in a channel within the town of Bishop. |
| <i>Sabulina stricta</i> bog sandwort | | CRPR 2B.3 | Jul–Sept | Moist, granitic gravelly sites in sedge meadows, seeps, alpine boulder and rock field, and alpine dwarf scrub from 8,000 ft. to 12,992 ft. | May potentially occur. This species was last recorded in 1977 along Coyote Ridge within the project watershed, 1.5 miles east of Green Creek Diversion Dam. |
| <i>Viola pinetorum</i> ssp. <i>grisea</i> grey-leaved violet | | CRPR 1B.2 | Apr–Jul | Dry mountain peaks and slopes in subalpine coniferous forest, upper montane coniferous forest, meadows, and seeps from 5,183 ft. to 12,139 ft. | May potentially occur. This species has been recorded 1.3 miles southeast of the project watershed's eastern boundary, 4.3 miles southeast of South Lake Dam, along Fifth Lake. |
| UNLIKELY TO OCCUR | | | | | |
| <i>Botrychium ascendens</i> upswept moonwort | USFS_S | CRPR 2B.3 | Jul–Aug | Grassy fields, meadows and seeps, coniferous woods near springs and creeks in lower montane coniferous forest from 3,658 ft. to 10,712 ft. | Unlikely to occur. This species was last recorded in 1920, outside the project watershed's eastern boundary, 1.9 miles east of Powerhouse No. 5 and Intake No. 6, along Rambaud Creek. |

| SCIENTIFIC/ COMMON NAME | FEDERAL STATUS | STATE STATUS AND CRPR RANK | BLOOMING PERIOD/ FERTILE | HABITAT | LIKELIHOOD FOR OCCURRENCE/ NOTES |
|--|-------------------|--|--------------------------------|---|--|
| <i>Botrychium minganense</i> Mingan moonwort | USFS_S | CRPR 2B.2 | Jul–Sept | Creekbanks in lower montane coniferous forest, upper montane coniferous forest, bogs and fens, meadows and seeps from 3,904 ft. to 10,810 ft. | Unlikely to occur. This species was last recorded in 1920, 6.6 miles south of the project watershed’s southern boundary, 9 miles south of South Lake, along Kings River. |
| <i>Crepis runcinata</i> fiddleleaf hawksbeard | – | CRPR 2B.2 | May–Jun | Moist, alkaline valley bottoms in Mojavean desert scrub and pinyon and juniper woodland from 1,246 ft. to 10,200 ft. | Unlikely to occur. This species was last recorded 4.6 miles east of the project watershed’s eastern boundary, 10 miles east of Powerhouse No. 2 and Intake No. 3, near Rawson Creek. |
| <i>Draba sierrae</i> Sierra draba | – | CRPR 1B.3 | Jun–Aug | In coarse sandy and gravelly soil; granitic or carbonate substrate in alpine boulder and rock fields from 11,482 ft. to 13,992 ft. | Unlikely to occur. Although this species has been recorded within the project’s watershed boundary (1.5 miles northeast of Green Creek Diversion Dam along Coyote Ridge) it is unlikely to occur because the project vicinity lies outside this species’ elevation range and the project vicinity does not support habitat appropriate for this species. |
| <i>Fimbristylis thermalis</i> hot springs fimbristylis | – | CRPR 2B.2 | Jun–Sept | Near hot springs in meadows and seeps from 378 ft. to 5,200 ft. | Unlikely to occur. This species was last recorded in 1964, 5.2 miles east of the project watershed’s eastern boundary, 10 miles east of Bishop Creek South Fork Diversion Dam, at Keough Hot Springs. 5.2 miles E of project watershed eastern boundary, and last observed in 1964. Additionally, the project vicinity lies outside this species’ elevation range, and the project vicinity does not support habitat appropriate for this species. |
| <i>Poa lettermanii</i> Letterman’s blue grass | – | CRPR 2B.3 | Jul–Aug | Sandy or rocky sites in alpine boulder and rock fields from 11,040 ft. to 14,009 ft. | Unlikely to occur. Although this species has been recorded within the project watershed boundary (1.8 miles northeast of Green Creek Diversion Dam and located at the head of West Fork Coyote Creek), it is unlikely to occur because the project vicinity is outside the species’ elevation range, and the project vicinity does not support habitat appropriate for this species. |
| <i>Pohlia tundrae</i> tundra thread moss | – | CRPR 2B.3 | N.A. | Moss growing on gravelly, damp soil in alpine boulder and rock fields from 8,858 ft. to 9,842 ft. | Unlikely to occur. Although this species has been recorded within the project watershed boundary (2 miles southeast of South Lake Dam along Long Lake), the project vicinity does not support habitat appropriate for this species. |
| <i>Potentilla morefieldii</i> Morefield’s cinquefoil | USFS_S | CRPR 1B.3 | Jul–Aug | Low areas in alpine calcareous (or granite) rocks in alpine boulder and rock fields from 10,712 ft. to 13,123 ft. | Unlikely to occur. Although this species has been recorded within the project watershed boundary (1.3 miles northeast of Green Creek Diversion Dam along Coyote Ridge) the project vicinity lies outside the species elevation range and does not support habitat appropriate for this species. |

USFS: USFS; BLM; CDFW; CNPS; CRPR
LEGEND:

BLM:

S: Sensitive

USFS

S Sensitive

| SCIENTIFIC/ COMMON NAME | FEDERAL STATUS | STATE STATUS AND CRPR RANK | BLOOMING PERIOD/ FERTILE | HABITAT | LIKELIHOOD FOR OCCURRENCE/OCCURRENCE NOTES |
|---|-------------------|--|--------------------------------|---------|--|
| CRPR | | | | | |
| 1B Plants Rare, Threatened, or Endangered in California and elsewhere | | | | | |
| 2B Plants Rare, Threatened, or Endangered in California but more common elsewhere | | | | | |
| 4 Plants of limited distribution – A Watch List | | | | | |
| CRPR Threat Code Extensions | | | | | |
| .1 Seriously threatened in California (over 80% of occurrences threatened; high degree and immediacy of threat) | | | | | |
| .2 Fairly threatened in California (20–80% of occurrences threatened; moderate degree and immediacy of threat) | | | | | |
| .3 Not very threatened in California (<20% of occurrences threatened; low degree and immediacy of threat or no current threats known) | | | | | |

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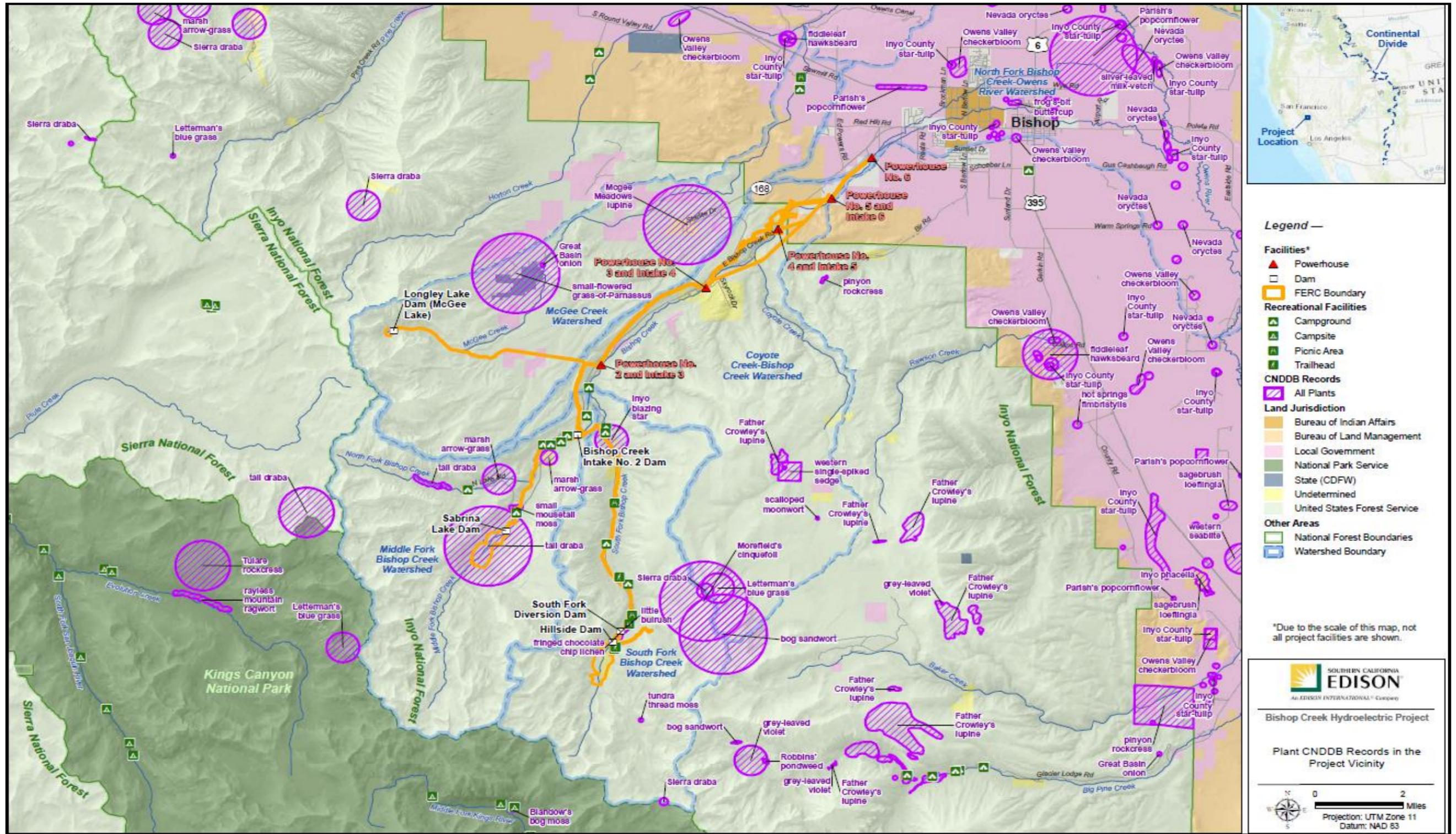


FIGURE 5-18 PLANT CNDDB RECORDS IN THE PROJECT VICINITY

5.4.1.5 Non-Native Invasive Plants

Information on non-native invasive plants (NNIPs) potentially occurring in the Project vicinity was obtained from the California Invasive Plant Inventory (Cal-IPC) (Cal-IPC 2015). Cal-IPC defines NNIPs as plants that 1) are not native to, yet can spread into, wildland ecosystems, and that also 2) displace native species, hybridize with native species, alter biological communities, or alter ecosystem processes (Cal-IPC 2015).

Cal-IPC categorizes plants as high, moderate, or limited, according to the degree of ecological impact in California (Cal-IPC 2015).

- **High** – Severe ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal and establishment. Most are widely distributed ecologically.
- **Moderate** – Substantial and apparent—but generally not severe—ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal, though establishment is generally dependent upon ecological disturbance. Ecological amplitude and distribution may range from limited to widespread.
- **Limited** – Invasive but ecological impacts are minor on a statewide level (or not enough information to justify a higher score). Their reproductive biology and other attributes result in low to moderate rates of invasiveness. Ecological amplitude and distribution are generally limited, but these species may be locally persistent and problematic.

Cal-IPC was queried to obtain a list of NNIPs based on two parameters:

- **Jepson region:** The Inventory uses geographic floristic provinces and subdivisions within California as described by the Jepson Flora Project (2015).
- **Habitat types:** Based on a comparison with vegetation alliances within 1 mile of the Project, three habitat types were selected: grassland, riparian, and woodland habitat.

The query of the Cal-IPC yielded a list of 54 species that have the potential to occur in the Project vicinity (Table 5-39). Two of these species, cheat grass (*Bromus tectorum*) and black locust (*Robinia pseudoacacia*) are known to be present in the Project vicinity. One species, hairy whitetop (*Lepidium appelianum*, formerly *Cardaria pubescens*) has been tentatively identified as occurring the landscape area around Plant 4.

TABLE 5-39 NNIPS POTENTIALLY OCCURRING IN THE PROJECT VICINITY

| SCIENTIFIC NAME | COMMON NAMES | RATING |
|---------------------------------------|---------------------|----------|
| POTENTIALLY OCCURRING | | |
| <i>Acroptilon repens</i> | Russian knapweed | Moderate |
| <i>Agrostis stolonifera</i> | creeping bent | Limited |
| <i>Ailanthus altissima</i> | tree-of-heaven | Moderate |
| <i>Arundo donax</i> | giant reed | High |
| <i>Asparagus asparagoides</i> | bridal creeper | Moderate |
| <i>Avena barbata</i> | slender oat | Moderate |
| <i>Avena fatua</i> | wild oats | Moderate |
| <i>Bassia hyssopifolia</i> | five-hook bassia | Limited |
| <i>Brassica tournefortii</i> | Sahara mustard | High |
| <i>Bromus diandrus</i> | ripgut brome | Moderate |
| <i>Bromus japonicus</i> | Japanese brome | Limited |
| <i>Bromus madritensis ssp. rubens</i> | red brome | High |
| <i>Bromus tectorum</i> | cheatgrass | High |
| <i>Centaurea diffusa</i> | diffuse knapweed | Moderate |
| <i>Centaurea melitensis</i> | tochalote | Moderate |
| <i>Centaurea solstitialis</i> | yellow starthistle | High |
| <i>Cirsium arvense</i> | Canada thistle | Moderate |
| <i>Cirsium vulgare</i> | bull thistle | Moderate |
| <i>Conium maculatum</i> | poison-hemlock | Moderate |
| <i>Cynodon dactylon</i> | Bermuda grass | Moderate |
| <i>Dactylis glomerata</i> | orchard grass | Limited |
| <i>Descurainia sophia</i> | tansy mustard | Limited |
| <i>Digitalis purpurea</i> | foxglove | Limited |
| <i>Dipsacus fullonum</i> | common teasel | Moderate |
| <i>Dittrichia graveolens</i> | stinkwort | Moderate |
| <i>Elaeagnus angustifolia</i> | Russian olive | Moderate |
| <i>Erodium cicutarium</i> | redstem filaree | Limited |
| <i>Festuca arundinacea</i> | reed fescue | Moderate |
| <i>Foeniculum vulgare</i> | fennel | Moderate |
| <i>Halogeton glomeratus</i> | Halogeton | Moderate |
| <i>Helminthotheca echioides</i> | bristly ox-tongue | Limited |
| <i>Hirschfeldia incana</i> | short-pod mustard | Moderate |
| <i>Holcus lanatus</i> | common velvet grass | Moderate |

| SCIENTIFIC NAME | COMMON NAMES | RATING |
|--|--------------------------|----------|
| <i>Lepidium appelianum</i> (= <i>Cardaria pubescens</i>) | hairy whitetop | Limited |
| <i>Lepidium latifolium</i> | perennial pepperweed | High |
| <i>Marrubium vulgare</i> | horehound | Limited |
| <i>Plantago lanceolata</i> | English plantain | Limited |
| <i>Poa pratensis</i> | Kentucky bluegrass | Limited |
| <i>Polypogon monspeliensis</i> | rabbitsfoot grass | Limited |
| <i>Ricinus communis</i> | castor bean | Limited |
| <i>Robinia pseudoacacia</i> | black locust | Limited |
| <i>Rubus armeniacus</i> | Himalayan blackberry | High |
| <i>Rumex acetosella</i> | sheep sorrel | Moderate |
| <i>Rumex crispus</i> | curly dock | Limited |
| <i>Salsola paulsenii</i> | barbwire Russian thistle | Limited |
| <i>Salsola tragus</i> | Russian thistle | Limited |
| <i>Saponaria officinalis</i> | bouncing-bet | Limited |
| <i>Schismus arabicus</i> | Mediterranean grass | Limited |
| <i>Sisymbrium irio</i> | London rocket | Limited |
| <i>Spartium junceum</i> | Spanish broom | High |
| <i>Stipa miliacea</i> var. <i>miliacea</i> | smilo grass | Limited |
| <i>Tamarix aphylla</i> | athel | Limited |
| <i>Tribulus terrestris</i> | puncture vine | Limited |
| <i>Verbascum thapsus</i> | woolly mullein | Limited |

Source: 2018 California Invasive Plant Council: Berkeley, CA. Available at: www.cal-ipc.org.

5.4.2 Wildlife Resources

This section describes common, special-status, and game species having the potential to occur in the Project vicinity.

5.4.2.1 Common Wildlife Species

A list of special-status wildlife species was compiled from the following sources:

- The California Natural Diversity Database (CNDDDB; CDFW 2018a)
- The US Fish and Wildlife Service's Information for Planning and Consultation (IPaC) website (UFWS 2018)

As with plants, the resulting list was then evaluated to determine which wildlife species occur or may potentially occur in the Project vicinity based a review of the following supplemental information:

- Psomas Biological Survey Reports (a total of 14 reports prepared for SCE between 2004 and 2014)
 - Environmental Assessment, Bishop Creek Project (FERC Project No. 1394-004) (FERC 1991)

As described in the above section, several terrestrial plant communities and habitats are present within the Project vicinity. A corresponding variety of wildlife species are present in association with these plant communities and habitats.

Herpetofauna species common to Lodgepole Pine Forest areas include the Pacific treefrog (*Pseudacris regilla*), Yosemite toad (*Anaxyrus canorus*), mountain yellow-legged frog (*Rana sierrae*), northern alligator lizard (*Elgaria coerulea*) and garter snakes (*Thamnophis* spp.).

Avifauna species common at upper elevations in lodgepole pine forests may include Williamson's sapsucker (*Sphyrapicus thyroideus*), Stellar's jay (*Cyanocitta stelleri*), mountain bluebird (*Sialia currucoides*), hermit thrush (*Catharus guttatus*), Clark's nutcracker (*Nucifraga columbiana*) and Cassin's finch (*Carpodacus cassinii*) (Laws 2007).

Resident mammals found at higher elevations in lodgepole pine forests include: mule deer (*Odocoileus hemionus*), coyote (*Canis latrans*), bushy-tailed woodrat (*Neotoma cinerea*), deer mouse (*Peromyscus maniculatus*), golden mantled ground squirrel (*Callospermophilus lateralis*), yellow-bellied marmot (*Marmota flaviventris*), and white-tailed jackrabbit (*Lepus townsendii*) (Laws 2007).

Pinyon-pine woodland, sagebrush scrub and desert scrub vegetation communities are found at lower elevations within the Project vicinity. Herpetofauna found in this area include the Great Basin spadefoot toad (*Scaphiopus intermontanus*), desert horned lizard (*Phrynosoma platyrhinos*), desert spiny lizard (*Sceloporus magister*), and western rattlesnake (*Crotalus oreganus*).

The pinyon jay (*Gymnorhinus cyanocephalus*) is very common in the pinyon-sagebrush zone: other common bird species include the black-billed magpie (*Pica pica*), gray flycatcher (*Empidonax wrightii*), and Brewer's sparrow (*Spizella breweri*).

Mammal species found in lower elevation habitats within the Project vicinity may include the pinyon mouse (*Peromyscus truei*), Nuttall's cottontail (*Sylvilagus nuttallii*), least chipmunk (*Neotamias minimus*), black-tailed jackrabbit (*Lepus californicus*), California vole (*Microtus californicus*), and southern grasshopper mouse (*Onychomys torridus*). Mule deer may also be found in lower elevation habitats.

Riparian habitats occur throughout the Project vicinity bordering the streams and upland vegetation. Occasional moist meadows also occur. These areas provide important habitat for various wildlife species, including many amphibian species dependent upon moisture and water.

Bird species either visiting or residing in riparian habitats or around meadows include the dipper (*Cinclus mexicanus*), Wilson's warbler (*Wilsonia pusilla*), belted kingfisher (*Megaceryle alcyon*), white-crowned sparrow (*Zonotrichia leucophrys*), willow flycatcher (*Empidonax traillii*), mountain bluebird (*Sialia currucoides*), yellow-rumped warbler (*Dendroica coronata*) and American robin (*Turdus migratorius*). In addition, many raptor species are found around riparian and meadow habitats, as well as other habitats throughout the Project vicinity. These species include the red-tailed hawk (*Buteo jamaicensis*), American kestrel (*Falco sparverius*), and goshawk (*Accipiter gentilis*).

Mammals that are found near riparian areas include: Belding's ground squirrel (*Urocitellus beldingi*), mountain beaver (*Aplodontia rufa*), and northern pocket gopher (*Thomomys*

talpoides). In addition, meadows and streams provide important habitat for the mule deer. Deer are found throughout the Project vicinity.

5.4.2.2 Special-Status Wildlife

This section describes special-status wildlife that occur or may potentially occur in the Project vicinity. This section addresses only special-status terrestrial wildlife species. Amphibians and reptiles that utilize aquatic habitats are included in this section because of their utilization of adjacent terrestrial habitats. Fish are addressed in Section 5.3 Fish and Aquatic Resources. Threatened and Endangered Wildlife are discussed in Section 5.7.

- Special status wildlife species are those species that are considered CSC by the state of California, categorized as Sensitive by the USFS and/or the BLM, or as a Species of Conservation Concern by the USFWS.

A list of Special Status wildlife species was compiled from the following sources:

- A query of the CNDDDB (CDFW 2018a) to obtain information on known occurrences in the Project vicinity. The following USGS 7.5-minute topographic quadrangles were queried for special status wildlife species: Coyote Flat, North Palisade, Tungsten Hills, Mt. Darwin, Mount Tom, Bishop, Mt. Goddard.
- USFWS Information, Planning, and Conservation System (IPaC) website (USFWS 2018)
- The geographic location and elevation of the Project and vegetation communities and other habitat features present to determine those species which may potentially occur.

Wildlife species on the list were then categorized as follows:

- Known to occur in the Project vicinity: Wildlife species with recorded occurrences in the Project vicinity, as determined by CNDDDB or SCE studies;
- May potentially occur in the Project vicinity: Wildlife species that “may potentially occur” in the Project vicinity based on the geographic location and elevation of the Project and wildlife habitats present.

Table 5-40 provides a list of special-status wildlife species evaluated for their potential to occur in the Project vicinity. Species listed in the table are categorized as known to occur or having the potential to occur in appropriate habitat. Table 5-40 also summarizes pertinent

information for each species, including status and preferred habitat, with information on the location of the occurrence, if applicable.

Figure 5-19 Wildlife CNDDDB records depicts the location of special-status wildlife that occur in the Project vicinity.

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TABLE 5-40 SPECIAL STATUS WILDLIFE SPECIES OCCURRENCE

| SCIENTIFIC/ COMMON NAME | FEDERAL STATUS | STATE STATUS | HABITAT | LIKELIHOOD FOR OCCURRENCE/OCCURRENCE NOTES |
|--|-------------------|---------------------|---|--|
| KNOWN TO OCCUR IN THE PROJECT VICINITY | | | | |
| <i>Accipiter gentilis</i> northern goshawk | BLM_S, USFS_S | CDF_S, CDFW_SSC | Usually nests on north slopes, near water. Red fir, lodgepole pine, Jeffrey pine, and aspens are typical nest trees within North coast coniferous forest, Subalpine coniferous forest, and Upper montane coniferous forest habitats from 915 ft. to 9,900 ft. | Known to occur. This species has been recorded 0.18 miles north of Birch Creek Diversion, in the vicinity of Birch Creek; and 0.75 miles south of South Lake Dam on the east side of South Lake. |
| MAY POTENTIALLY OCCUR IN THE PROJECT VICINITY | | | | |
| <i>Corynorhinus townsendii</i> Townsend's big-eared bat | USFS_S, BLM_S | CDFW_SSC | Roosts in the open, hanging from walls and ceilings throughout California in a wide variety of habitats, including chaparral, chenopod scrub, Great Basin grassland, Great Basin scrub, Upper and Lower montane coniferous forest, Meadow and seep Riparian forest/woodland, and valley and foothill grassland. Most common in mesic sites. Roosting sites limiting. Extremely sensitive to human disturbance. Found from 4,000 ft. to 10,800 ft. | May potentially occur. This species has been recorded at Yaney Mine, approximately 1.1 miles east of the project watershed's eastern boundary, 1.6 miles northeast of Powerhouse No. 5 and Intake 6. |
| <i>Euderma maculatum</i> spotted bat | BLM_S | CDFW_SSC | Feeds over water and along washes. Feeds almost entirely on moths. Needs rock crevices in cliffs or caves for roosting within wide variety of habitats from arid deserts and grasslands through mixed conifer forests from mostly 900 ft. to 2,700 ft. but up to 9,700 ft. | May potentially occur. This species has been recorded 1.5 miles northeast of Powerhouse No. 6, located in a residential area between Highway 395 and Highway 168, northeast of the project watershed northeastern-most boundary. |
| <i>Hydromantes platycephalus</i> Mount Lyell salamander | - | CDFW_WL | Active on the surface only when free water is available, in the form of seeps, drips, or spray. Found in rocky habitat, including cliff faces and cave walls, within mixed conifer, red fir, lodgepole pine, and subalpine habitats, from 4000 ft. to 11,600 ft. in elevation. Occasionally found under woody debris. | May potentially occur. This species has been recorded 4.6 miles northwest of the project watershed's northwestern boundary, 5.3 miles northwest of Longley Lake Dam/McGee Lake, along Pine Creek Trail. |
| <i>Lepus townsendii</i> western white-tailed jackrabbit | - | CDFW_SSC | Open areas with scattered shrubs and exposed flat-topped hills with open stands of trees, brush and herbaceous understory within sagebrush, subalpine conifer, juniper, alpine dwarf shrub and perennial grassland habitats, from 120 ft. to 12,000ft. | May potentially occur. This species has been recorded north of Bishop, northeast of the project watershed's northeastern-most boundary, 4.5 miles northeast of Powerhouse No. 6 along North Fork Bishop Creek near Highway 6. |
| <i>Lithobates pipiens</i> northern leopard frog | - | CDFW_SSC | Highly aquatic species. Shoreline cover, submerged and emergent aquatic vegetation are important habitat characteristics within freshwater marsh, Great Basin flowing waters, Great Basin standing waters, marsh and swamp, wetland habitats, from sea level to 7,000 ft. | May potentially occur. This species has been recorded northwest of the project watershed's northernmost boundary, 1.7 miles northwest of Powerhouse No. 6, 0.4 mile east of Birch Creek, 4 miles west of Bishop. |
| <i>Martes caurina sierrae</i> Sierra marten | USFS_S | - | Needs variety of different-aged stands, particularly old-growth conifers and snags which provide cavities for dens/nests, within mixed evergreen forests with more than 40% crown closure along Sierra Nevada and Cascade mountains, from 8,000 ft. to 10,300 ft. | May potentially occur. This species has been recorded 2.7 miles southwest of Lake Sabrina Dam, along Middle Fork Bishop Creek just south of Dingleberry Lake. |
| <i>Ochotona princeps schisticeps</i> gray-headed pika | - | CDFW verbal request | Talus slopes, alpine talus and scree slopes, occasionally on mine tailings. Prefers talus-meadow interface. Found in mountainous areas, generally at higher elevations, often above the tree line up to the limit of vegetation. At lower elevations found in rocky areas within forests or near lakes; from near sea level to greater than 12,000 ft. | May potentially occur. This species has been recorded 1.2 miles northwest of Lake Sabrina Dam along North Fork Lamarck Creek, 0.49 miles west of North Lake. |

| SCIENTIFIC/ COMMON NAME | FEDERAL STATUS | STATE STATUS | HABITAT | LIKELIHOOD FOR OCCURRENCE/OCCURRENCE NOTES |
|--|-------------------|-----------------|---------|--|
| <p>USFS; BLM; CDFW; CDF</p> <p>LEGEND:</p> <p>USFWS: S: Sensitive</p> <p>USFS S Sensitive</p> <p>BLM S Sensitive</p> <p>CDFW SSC Species of Special Concern WL Watch List</p> | | | | |

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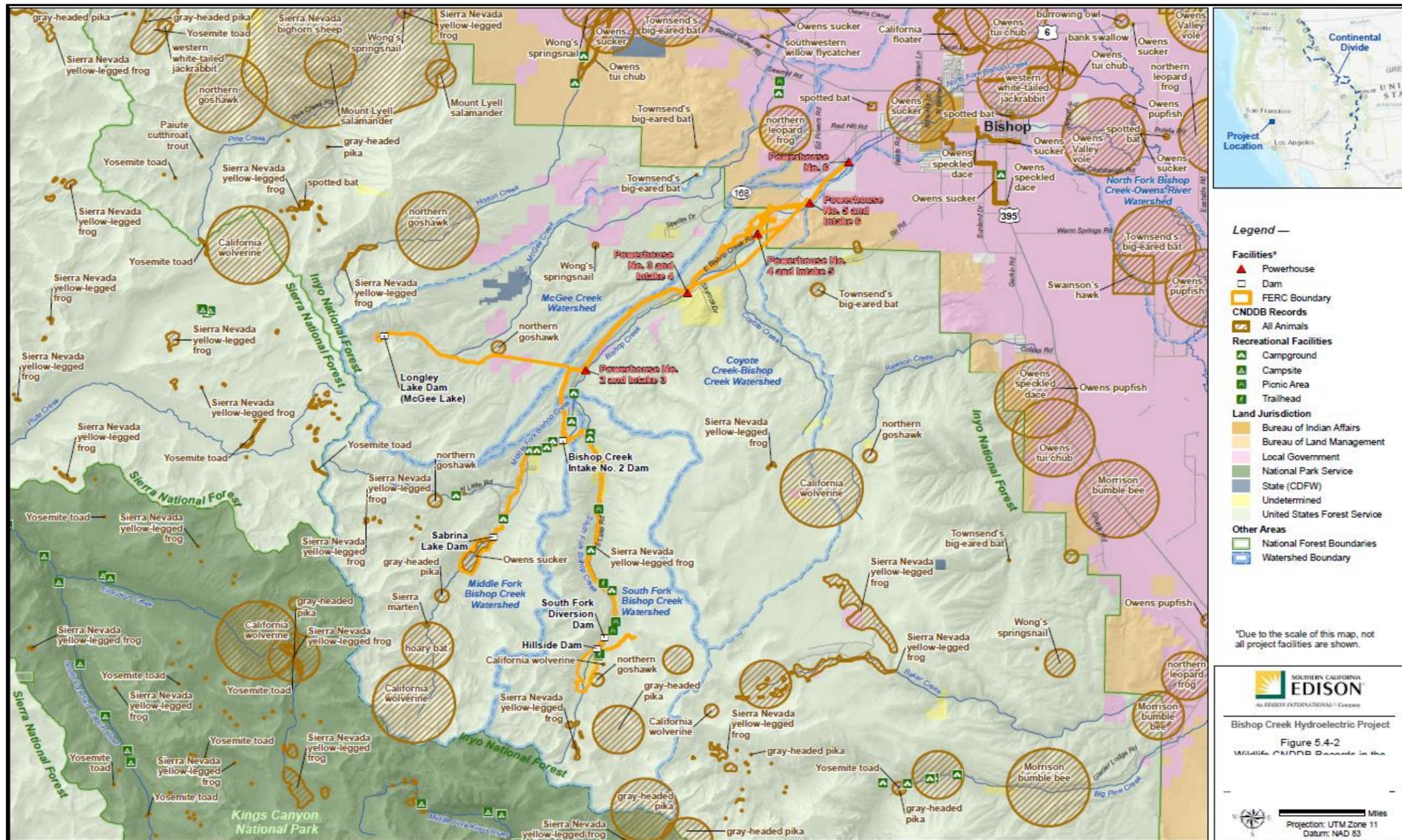


FIGURE 5-19 WILDLIFE CNDDDB RECORDS IN THE PROJECT VICINITY

Table 5-41 provides a list of bird species deemed to be Species of Conservation Concern by the USFWS.

TABLE 5-41 USFWS BIRD SPECIES OF CONSERVATION CONCERN

| SPECIES | BREEDING SEASON | HABITAT | POTENTIAL TO OCCUR |
|---|------------------|---|--|
| Black Rosy-finch <i>Leucosticte atrata</i> | Jun 15 to Aug 31 | Above timberline throughout its range, wherever proper cliffs and rock slides provide nest sites with protection from falling rocks and hail, and where there are adequate feeding grounds on tundra, fellfields, rock slides, snowfields, and glaciers within commuting distance. May occur in enclaves of alpine habitat on northeast faces of mountains whose summits are below timberline, but where cliffs, shade, and snow produce alpine climate. | Observed at Aspendell; suitable habitat. |
| Brewer's Sparrow <i>Spizella breweri</i> | May 15 to Aug 10 | Breeds in shrublands; most closely associated with landscapes dominated by big sagebrush (<i>Artemisia tridentata</i>). Overwinters in sagebrush shrublands and brushy desert habitat, including desert scrub dominated by various saltbush species (<i>Atriplex</i> spp.) and creosote (<i>Larrea tridentata</i>). | Observed at Aspendell, Intake 2, Lake Sabrina, South Lake, and North Lake; suitable habitat. |
| Cassin's Finch <i>Carpodacus cassinii</i> | May 15 to Jul 15 | Generally open coniferous forests of interior western mountains over a broad elevational range. Often found in mature forests of lodgepole pine (<i>Pinus contorta</i>) and ponderosa pine (<i>P. ponderosa</i>) | Observed at Intake 4, Aspendell, Intake 2, Lake Sabrina, South Lake, and North Lake; suitable habitat. |
| Green-tailed Towhee <i>Pipilo chlorurus</i> | May 1 to Aug 10 | Habitat varies with elevation. Dry shrubby hillsides (shrub-steppe) and post-disturbance shrubby second growth are most commonly used. Vegetation may be characterized as low brush cover, often interspersed with trees; avoids typical forest. | Observed at Aspendell, Intake 2, Lake Sabrina, South Lake, and North Lake; suitable habitat. |
| Lesser yellowlegs <i>Tringa flavipes</i> | Breeds elsewhere | Common breeder in boreal forest (generally open forest) and forest/tundra transition habitats; less abundant in adjacent subarctic tundra. Also nests in man-made habitats such as seismic and gas line right-of-ways, road allowances, and mine clearings. Typical foraging areas are located along the shores of large, shallow, freshwater lakes and sloughs (interior breeders) or in brackish portions of salt marshes (coastal breeders). | Not expected to occur for breeding; no potentially suitable breeding habitat; may occur as a migrant. |
| Lewis's Woodpecker <i>Melanerpes lewis</i> | Apr 20 to Sep 30 | Important aspects of breeding habitat include an open canopy, a brushy understory offering ground cover, dead or downed woody material, available perches, and abundant insects. Three principal habitats are open ponderosa pine forest, open riparian woodland dominated by cottonwood, and logged or burned pine (<i>Pinus</i> spp.) forest; also found in oak (<i>Quercus</i> spp.) woodland, nut and fruit orchards, piñon pine-juniper (<i>Pinus cembroides</i> – <i>Juniperus</i> spp.) woodland, a variety of pine and fir (<i>Abies</i> spp.) forests, and agricultural areas including farm- and ranchland. Often classified as a specialist in burned pine forest habitat. | Observed at Aspendell; suitable habitat. |
| Long-billed curlew <i>Numenius americanus</i> | Apr 1 to Jul 31 | Nests primarily in short-grass or mixed-prairie habitat with flat to rolling topography. Wide range of habitats used during migration, including dry short-grass prairie, wetlands associated with alkali lakes, playa lakes, wet coastal pasture, tidal mudflats, salt marsh, alfalfa fields, barley fields, fallow agriculture fields, and harvested rice fields. Overwinters in tidal estuaries, wet pasture habitats, and sandy beaches. | Not expected to occur for breeding; no potentially suitable breeding habitat; may occur as a migrant |
| Marbled Godwit <i>Limosa fedoa</i> | Breeds elsewhere | In northern prairies of Canada and United States, breeds in short, sparsely to moderately vegetated landscapes that include native grassland and wetland complexes with a variety of wetland classes (ephemeral to semi-permanent). Away from breeding areas, most migrants found in flocks at coastal estuaries, mudflats, salt marshes, lagoons, and sandy beaches. Habitats used by birds in winter like those of coastal migrants: coastal mudflats adjoining savannas or meadows, estuaries, sandy beaches, and sandflats; sometimes roosting at salt ponds. | Not expected to occur for breeding; no potentially suitable breeding habitat; may occur as a migrant |
| Olive-sided Flycatcher <i>Contopus cooperi</i> | May 20 to Aug 31 | Primarily montane and northern coniferous forests. May occur at any elevation from sea level to timberline, but usually at mid- to high-elevation forest (3,018 ft. to 6,988ft.). Within the coniferous forest biome, most often associated with forest openings, forest edges near natural openings (e.g., meadows, canyons, rivers) or human-made openings (e.g., harvest units), or open to semi-open forest stands. Frequently occurs along wooded shores of streams, lakes, rivers, beaver (<i>Castor canadensis</i>) ponds, bogs, and muskegs, where natural edge habitat occurs and standing dead trees often are present. | Observed at Aspendell, Intake 2, Lake Sabrina, South Lake, and North Lake; suitable habitat. |

| SPECIES | BREEDING SEASON | HABITAT | POTENTIAL TO OCCUR |
|---|------------------|--|--|
| Pinyon Jay <i>Gymnorhinus cyanocephalus</i> | Feb 15 to Jul 15 | Piñon-juniper woodland is used most extensively but flocks also breed in sagebrush (<i>Artemisia</i> spp.), scrub oak (<i>Quercus</i> spp.) and chaparral communities. In parts of its range (central Arizona, southern California), inhabits ponderosa and Jeffrey pine (<i>Pinus jeffreyi</i>) forests. | Observed at Intake 4, Aspendell, and Intake 2; suitable habitat. |
| Rufous Hummingbird <i>Selasphorus rufus</i> | Breeds elsewhere | Breeds in dense mature and second growth coniferous forests, deciduous woods, riparian thickets, swamps and meadows, farmland, pasture edges, orchards and city yards, parks and gardens; in the Pacific Northwest United States and Canada. Migrants utilize montane meadows; alpine meadows in the Sierras as high as 11,500 ft. Overwinter in Mexico. | Observed at Aspendell, Intake 2, Lake Sabrina, South Lake, and North Lake; suitable habitat. |
| Sage Thrasher <i>Oreoscoptes montanus</i> | Apr 15 to Aug 10 | Shrub-steppe dominated by big sagebrush (<i>Artemisia tridentata</i>). Considered a sagebrush obligate but noted in black greasewood (<i>Sarcobatus vermiculatus</i>) habitat in Utah and Nevada and bitterbrush (<i>Purshia tridentata</i>) habitat in Washington. Migrants utilize sagebrush plains, arid shrub, grassland with scattered bushes, and open piñon-juniper woodland, primarily in arid or semiarid situations; rarely around towns. Overwinter in arid to semiarid, open and semi-open country with scrub, scattered bushes, and sagebrush. | Observed 0.85 miles northeast of Powerhouse No. 3; suitable habitat. |
| Sagebrush Sparrow <i>Artemisospiza nevadensis</i> | Mar 15 to Jul 31 | Prefers semi-open habitats with evenly spaced shrubs 3 ft. to 6 ft. high. Vertical structure, habitat patchiness, and vegetation density may be more important in habitat selection than specific shrub species, but this sparrow is closely associated with big sagebrush throughout most of its range. Observed in creosote bush, low desert scrub, and coastal sagebrush scrub during migration. In northern portions of its range, favors big sagebrush. Farther south, fairly common to uncommon during winter in desert washes, big sagebrush, creosote bush, sparse cactus scrub, arid grasslands, and arboreal yucca (<i>Yucca</i> spp.) mixed with greasewood | Observed at Intake 4, and Intake 2; suitable habitat. |
| Virginia warbler <i>Vermivora virginiae</i> | May 1 to Jul 31 | Over most of its range, typically found breeding in piñon-juniper and oak woodlands. May also occur in high-altitude life zones dominated by large conifers but tends to select patches of shrubby vegetation for breeding; never occurs in coniferous forests where there is not a deciduous mix (CRO). Strong association for breeding in steep draws, drainages, or slopes with oak or other shrubby vegetation. | Observed at Aspendell and South Lake; suitable habitat. |
| White-headed woodpecker <i>Picoides albolarvatus</i> | May 1 to Aug 15 | Requires montane coniferous forests dominated by pines (<i>Pinus</i> spp.), with tree species composition varying geographically. Within the Sierra Nevada, occupies mixed coniferous forest of ponderosa and sugar pines, white fir, red fir (<i>Abies magnifica</i>), Douglas-fir, and black oak (<i>Quercus kelloggii</i>); occurs more locally on drier east-slope forests dominated by Jeffrey pine (<i>P. jeffreyi</i>) and in high-elevation lodgepole pine and western white pine (<i>P. monticola</i>) forests, and is generally absent from digger pine (<i>P. sabiniana</i>)-dominated habitats at lower elevations on western flank of the Sierra Nevada. | Observed at Aspendell, Intake 2, Lake Sabrina, and South Lake; suitable habitat. |
| Willet <i>Tringa semipalmata</i> | Apr 20 to Aug 5 | On the prairies, uses short, sparse cover in wetlands and grasslands. Breeds on semiarid plains near bodies of water (eastern Oregon), in grasslands associated with shallow wetlands (s. Alberta), in native grasslands and to a lesser extent cropland (N. Dakota), in uplands near brackish or saline wetlands, and less frequently on alkali flats (Utah) and lakes in forested mountain areas. During nonbreeding season, found in diverse California coastal types: mudflat, marsh, sandy beach, and rocky coast. | Not expected to occur for breeding; no potentially suitable breeding habitat; may occur as a migrant |
| Williamson's Sapsucker <i>Sphyrapicus thyroideus</i> | May 1 to Jul 31 | Throughout range, breeds in middle to high elevation conifer and mixed conifer-deciduous forests. Common in montane western larch, Douglas fir (<i>Pseudotsuga menziesii</i>), ponderosa pine, and pine-fir forests. | Observed at Aspendell, Lake Sabrina, South Lake, and North Lake; suitable habitat. |
| Willow Flycatcher <i>Empidonax traillii</i> | May 20 to Aug 31 | In general, prefers moist, shrubby areas, often with standing or running water; e.g., in California, restricted to thickets of willows, whether along streams in broad valleys, in canyon bottoms, around mountain-side seepages, or at the margins of ponds and lakes in the West, generally occurs in beaver meadows, along borders of clearings, in brushy lowlands, in mountain parks, or along watercourses to 7,500 ft. | Observed at Aspendell, Lake Sabrina, South Lake, and North Lake; suitable habitat. |

**TABLE 5-42 U.S. FOREST SERVICE SIERRA NATIONAL FORESTS
MANAGEMENT INDICATOR SPECIES**

| Species | Habitat/Ecosystem | Category for Analysis¹ |
|--|---|--|
| Aquatic macroinvertebrates | Riverine and Lacustrine | Category 2 |
| Fox sparrow <i>Passerella iliaca</i> | Shrubland (west-slope chaparral types) | Category 2 |
| Mule deer <i>Odocoileus hemionus</i> | Oak-associated hardwood and hardwood/conifer | Category 2 |
| Yellow warbler <i>Dendroica petechia</i> | Riparian | Category 2 |
| Pacific tree frog <i>Pseudacris regilla</i> | Wet meadow | Category 2 |
| Mountain quail <i>Oreortyx pictus</i> | Early seral coniferous forest | Category 2 |
| Mountain quail <i>Oreortyx pictus</i> | Mid seral coniferous forest | Category 2 |
| Sooty (blue) grouse <i>Dendragapus obscurus</i> | Late seral open canopy coniferous Forest | Category 2 |
| California spotted owl <i>Strix occidentalis</i> | Late seral closed canopy coniferous forest | Category 2 |
| American marten <i>Martes americana</i> | Late seral closed canopy coniferous forest | Category 2 |
| Humboldt's lying squirrel ² <i>Glaucomys oregonensis</i> | Late seral closed canopy coniferous forest | Category 2 |
| Hairy woodpecker <i>Picoides villosus</i> | Snags in green forest | Category 2 |
| 1 | <p>Category 1: MIS whose habitat is not in or adjacent to the project area and would not be affected by the Project.</p> <p>Category 2: MIS whose habitat is in or adjacent to project area but would not be either directly or indirectly affected by the Project.</p> <p>Category 3: MIS whose habitat would be either directly or indirectly affected by the Project.</p> | |
| 2 | <p>Formerly included within <i>Glaucomys sabrinus</i>. Elevated to species status in California, Oregon and portions of Washington by Arbogast, et. al. 2017.</p> | |

5.5 THREATENED AND ENDANGERED WILDLIFE RESOURCES

5.5.1 Regulatory Setting

5.5.1.1 Federal Endangered Species Act

The Federal Endangered Species Act (FESA) protects plants and animals that the USFWS has listed as endangered or threatened. A federally listed species is protected from unauthorized “take,” which is defined in the FESA as acts to “harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in any such conduct” (16 USC Sections 1532[19] and 1538[a]). In this definition, “harm” includes “any act which actually kills or injures fish or wildlife and emphasizes that such acts may include significant habitat modification or degradation that significantly impairs essential behavioral patterns of fish or wildlife” (50 Code of CFR, Title 50, Section 17.3). Unless performed for scientific or conservation purposes with the permission of the USFWS, take of listed species is only permissible if the USFWS issues an Incidental Take Permit (ITP). When issuing an ITP, all federal agencies, including the USFWS, must ensure that their activities are “not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species” (16 USC 1536[a]). Enforcement of the FESA is administered by the USFWS.

The FESA also provides for designation of critical habitat, defined as specific areas within the geographical range occupied by a species where physical or biological features “essential to the conservation of the species” are found and “which may require special management considerations or protection” (16 USC 1538[5][A]). Critical habitat may also include areas outside the current geographical area occupied by the species that are nonetheless essential for the conservation of the species.

5.5.1.2 Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act (16 USC 668) provides for the protection of the bald eagle (*Haliaeetus leucocephalus*) and the golden eagle (*Aquila chrysaetos*) by prohibiting, except under certain specified conditions, the taking, possession, and commerce of such birds. The 1972 amendments increased penalties for violating provisions of the Act

and strengthened other enforcement measures. A 1978 amendment authorizes the Secretary of the Interior to permit the taking of golden eagle nests that interfere with resource development or recovery operations. A 1994 Memorandum from President William Clinton to the heads of Executive Agencies and Departments establishes the policy concerning collection and distribution of eagle feathers for Native American religious purposes.

5.5.1.3 California Endangered Species Act

The State of California implements the California Endangered Species Act (CESA) which is enforced by the CDFW. While the provisions of the CESA are similar to the FESA, CDFW maintains a list of California threatened and endangered species, independent of the FESA threatened and endangered species list. It lists species that are considered rare and candidates for listing, which also receive protection. The California list of endangered and threatened species is contained in Title 14, Sections 670.2 (plants) and 670.5 (animals) of the California Code of Regulations.

State-listed threatened and endangered species are protected under provisions of the CESA. Activities that may result in take of individuals (defined in CESA as acts to “hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill”) are regulated by the CDFW. While habitat degradation or modification is not included in the definition of take under CESA, the CDFW has interpreted take to include the destruction of nesting, denning, or foraging habitat necessary to maintain a viable breeding population of protected species.

If it is determined that the take would not jeopardize the continued existence of the species, an ITP can be issued by CDFW per Section 2081 of the California Code of Regulations. If a state-listed species is also federally listed, and the USFWS has issued an ITP, the ITP issued by USFWS would satisfy CDFW’s requirements; CDFW may issue a consistency finding in accordance with Section 2080.1 of the California Fish and Game Code.

5.5.1.4 California Fully Protected Species

The State of California created the “Fully Protected” classification to identify and provide additional protection to those animals that are rare or that face possible extinction. Lists were created for fish, amphibians and reptiles, birds, and mammals. Most of the species on these

lists have subsequently been listed under the state and/or federal ESAs; however, some have not been formally listed.

Various sections of the California Fish and Game Code provide lists of fully protected reptile and amphibian (§ 5050), bird (§ 3511), and mammal (§ 4700) species that may not be taken or possessed at any time, except as provided in Sections 2081.7, 2081.9, or 2835. The CDFW is unable to authorize the issuance of permits or licenses to take these species, except for necessary scientific research.

5.5.2 Definitions

A federally endangered species is one facing extinction throughout all or a significant portion of its geographic range. A federally threatened species is one likely to become endangered within the foreseeable future throughout all or a significant portion of its range. The presence of any federally listed threatened or endangered species in a project impact area generally imposes severe constraints on development, particularly if development would result in “take” of the species or its habitat. The term “take” means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in such conduct. “Harm” in this sense can include any disturbance of species’ habitats during any portion of its life history.

Proposed species or candidate species are those officially proposed by the USFWS for addition to the federal threatened and endangered species list. Because proposed species may soon be listed as threatened or endangered, these species could become listed prior to or during implementation of a proposed Project. The presence of a proposed or candidate species within a project impact area may impose constraints on development if they are listed prior to issuance of project permits, particularly if the Project would result in “take” of the species or its habitat.

The state of California considers an endangered species to be one whose prospects of survival and reproduction are in immediate jeopardy, a threatened species as one present in such small numbers throughout its range that it is likely to become an endangered species in the near future in the absence of special protection or management, and a rare species as one

present in such small numbers throughout its range that it may become endangered if its present environment worsens. Rare species only applies only to California native plants. State-listed threatened and endangered species are protected against take unless an ITP is obtained from the resource agencies. The presence of any state-listed threatened or endangered species in a project impact area generally imposes severe constraints on development, particularly if a project would result in take of the species or its habitat.

5.5.3 Federal and State Listed Wildlife Species

Based on a review of the California Natural Diversity Data Base (CDFW 2018a), CDFW's List of State and Federally Listed Threatened and Endangered Animals in California (CDFW 2018b), Sierra High Mountain Lakes Project Monitoring Units, SNYLFs and MYLESs (northern DPS) Field Season 2017 (CDFW 2018c), USFWS IPaC website (USFWS 2018), USFWS' Seven Year Work Plan September 2016 Version (USFWS 2016a), and USFWS Unscheduled Listing Actions September 2016 version (USFWS 2016b), eight wildlife species designated as threatened or endangered by the USFWS or CDFW were determined to have the potential to occur within the project's contributing watershed (Figure 5-20).

Table 5-43 lists each species and its potential to occur in the project area.

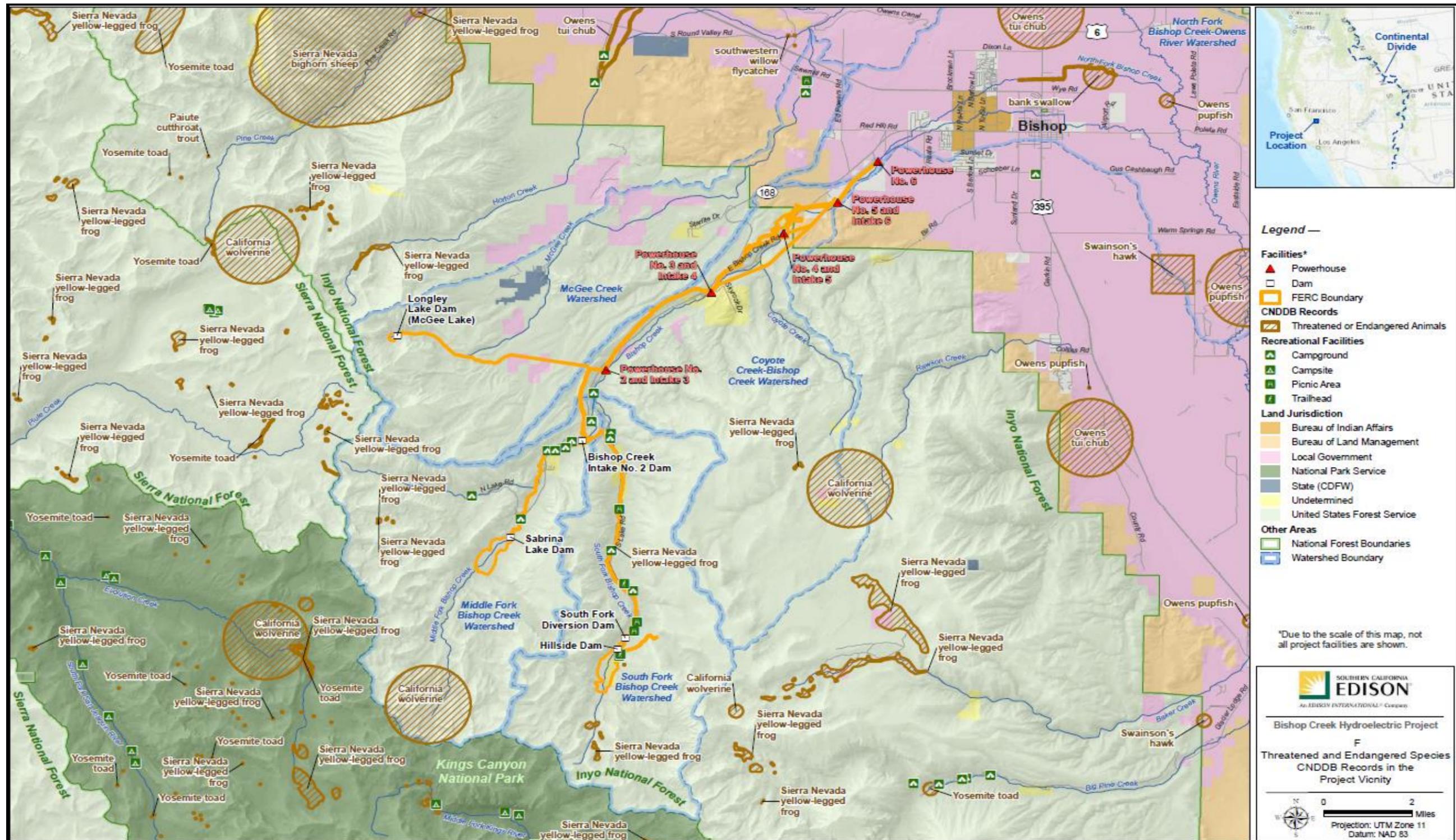


FIGURE 5-20 THREATENED AND ENDANGERED SPECIES RECORDED BY CNDDB IN THE PROJECT VICINITY

TABLE 5-43 ENDANGERED SPECIES POTENTIAL FOR OCCURRENCE

| SCIENTIFIC/ COMMON NAME | FEDERAL STATUS | STATE STATUS | HABITAT | LIKELIHOOD FOR OCCURRENCE/ OCCURRENCE NOTES |
|--|-----------------------------------|------------------------|--|---|
| KNOWN TO OCCUR IN THE PROJECT VICINITY | | | | |
| <i>Rana sierrae</i> Sierra Nevada yellow-legged frog | Endangered, USFS_S | Threatened, CDFW_WL | Always encountered within a few feet of water. Tadpoles may require 2 to 4 years to complete their aquatic development. Found in streams, lakes and ponds in montane riparian and a variety of other habitats from 4,100 to 11,000 ft. | Known to occur, located along South Fork Bishop Creek, 2.1 miles S of Bishop Creek South Fork Diversion Dam, Wonder Lake, 2.3 mi north west of Lake Sabrina, Treasure Lakes 3,4,5,6, and 7; 1.6 miles west of north end of South Lake. |
| Willow Flycatcher <i>Empidonax traillii</i> | USFS_S | Endangered | In general, prefers moist, shrubby areas, often with standing or running water; e.g., in California, restricted to thickets of willows, whether along streams in broad valleys, in canyon bottoms, around mountain-side seepages, or at the margins of ponds and lakes. In the West, generally occurs in beaver meadows, along borders of clearings, in brushy lowlands, in mountain parks, or along watercourses to 7,500 ft. | Observed at Aspendell, Lake Sabrina, South Lake, and North Lake; suitable habitat. E-Bird observation. |
| <i>Gulo gulo</i> California wolverine | Proposed Threatened, USFS_S | Threatened, FP | Needs water source. Uses caves, logs, burrows for cover and den area. Hunts in more open areas. Can travel long distances. Found in the north coast mountains and the Sierra Nevada. Found in a wide variety of high elevation habitats, including Alpine, Meadow and seep, North coast coniferous forest, riparian forest, Subalpine coniferous forest, Upper montane coniferous forest, and Wetland from 1,500 to 4,500 ft. | Known to occur, 0.38 miles S of South Lake Dam, located along the E-side of South Lake |
| MAY POTENTIALLY OCCUR IN THE PROJECT VICINITY | | | | |
| <i>Haliaeetus leucocephalus</i> bald eagle | FSS | SE, FP | Requires large bodies of water, or free flowing rivers with abundant fish, and adjacent snags or other perches and nesting sites to support them. Perching sites need to be composed of large trees or snags with heavy limbs or broken tops. It roosts communally in winter in dense, sheltered, remote conifer stands. Breeding habitat in California is primarily in mountain and foothill forests and woodlands near reservoirs, lakes, and rivers. | Bald eagle has been observed at Aspendell, Intake 2, Lake Sabrina, and South Lake as reported on e-bird. the potential to occur, but no occurrences of bald eagle were documented in the CNDDDB search for the Project area. |
| <i>Aquila chrysaetos</i> golden eagle | -- | FP, WL | Golden eagles occur locally in open country such as open coniferous forest, sage-juniper flats, desert, barren areas, especially in rolling foothills and mountainous regions. Within southern California, the species favors grasslands, brushlands, deserts, oak savannas, open coniferous forests, and montane valleys. Nesting is primarily restricted to rugged, mountainous country. Cliff-walled canyons provide nesting habitat in most parts of range; also, large trees in open areas. | Golden eagle has been observed at Aspendell, Intake 2, Lake Sabrina, North Lake, and South Lake as reported on e-bird has the potential to occur, but no occurrences of golden eagle were documented in the CNDDDB search for the project area. |
| <i>Anaxyrus canorus</i> Yosemite toad | Threatened | CDFW_SSC | Primarily montane wet meadows; also in seasonal ponds associated with lodgepole pine and subalpine conifer forest within meadow and seep, subalpine coniferous forest, and wetland habitat, from 6,400 to 11,300 ft. | May potentially occur, 5.5 miles SW of Lake Sabrina Dam, located 1.2 miles SW of project watershed western boundary |

| SCIENTIFIC/ COMMON NAME | FEDERAL STATUS | STATE STATUS | HABITAT | LIKELIHOOD FOR OCCURRENCE/ OCCURRENCE NOTES |
|---|-------------------|-----------------|---|--|
| <i>Oncorhynchus clarkii seleniris</i> Paiute cutthroat trout | Threatened | – | Cannot tolerate presence of other salmonids. Requires clean gravel for spawning and cool, well-oxygenated waters in Great Basin flowing water habitat, at elevations up to 10,000 ft. | May potentially occur, 6.2 miles NW of Longley Lake Dam/McGee Lake, located in Birchim Lake in the headwaters of Pine Creek miles NW of the project 5.4 miles NW the project watershed northwestern boundary |
| <i>Siphateles bicolor snyderi</i> Owens tui chub | Endangered | Endangered | Needs clear, clean water, adequate cover, and aquatic vegetation within a variety of habitats, including Great Basin flowing water and Great Basin standing water within the Owens River basin; at elevations above 4,000 ft. | May potentially occur, 4.4 miles NE of Powerhouse No. 6, located along North Fork Bishop Creek near Hwy 6 N of Bishop, NE of the project watershed northeastern most boundary |
| <i>Vulpes necator</i> Sierra Nevada red fox | Candidate, USFS_S | Threatened | Use dense vegetation and rocky areas for cover and den sites. Found in a variety of habitats, including Alpine, Alpine dwarf scrub, broadleaved upland forest, meadow and seep, riparian scrub, Subalpine coniferous forest, Upper montane coniferous forest, and wetland; at elevations above 2,500 ft. | May potentially occur, 3.8 miles NE of Powerhouse No. 6, located in Bishop, NE of the project watershed northeastern most boundary; last seen in 1922 |
| <i>Ovis canadensis sierrae</i> Sierra Nevada bighorn sheep | Endangered | Endangered, FP | Available water and steep, open terrain free of competition from other grazing ungulates within alpine, alpine dwarf scrub, chaparral, chenopod scrub, Great Basin scrub, Mojavean desert scrub, montane dwarf scrub, pinon and juniper woodlands, riparian woodland, and Sonoran desert scrub habitats, from 5,000 to 9,000 ft during the winter and 10,000 to 14,000 ft during summer | May potentially occur, 12.9 miles NW of Powerhouse No. 6, located at Wheeler Crest (aka Wheeler Ridge), 10-mile s NW of Bishop, 12.9 miles NW the project watershed northern boundary |

UNLIKELY TO OCCUR IN THE PROJECT VICINITY

| | | | | |
|--|------------|------------|---|--|
| <i>Agelaius tricolor</i> Tricolored blackbird | | Threatened | This colonial nesting species prefers to breed in freshwater marshes dominated by cattails and bulrushes, with willows and nettles also common. The introduced mustards, blackberries, thistles, and mallows have been commonly used for several decades. Preferred roost sites include cattail and bulrush marshes near suitable foraging areas including pasturelands, recently cultivated croplands, and livestock feedstores. | Unlikely to occur; no potentially suitable breeding habitat. |
| <i>Rana muscosa</i> Mountain Yellow-legged Frog | Endangered | Endangered | Mountain yellow-legged frogs are highly aquatic and are rarely found more than 3.3 feet from water. They can be found sitting on rocks along the shoreline where there may be little or no vegetation. These species historically inhabited lakes, ponds, marshes, meadows, and streams at elevations typically ranging from about 4,500 to 12,000 feet. | Unlikely to occur. No recorded occurrences in Inyo County. |

USFS: U.S. Forest Service; BLM: Bureau of Land Management; CDFW: California Department of Fish and Wildlife; CDF: California Department of Forestry and Fire Protection

LEGEND:

USFWS:

S: Sensitive

USFS

S Sensitive

BLM

S Sensitive

CDFW

SSC Species of Special Concern

WL Watch List

5.5.4 Critical Habitat

On August 26, 2016, the USFWS published the current Final Rule designating 750,926 acres of land as critical habitat for the Yosemite toad and 1,082,147 acres of land as critical habitat for the Sierra Nevada yellow-legged frog in Alpine, Amador, Calaveras, El Dorado, Fresno, Inyo, Lassen, Madera, Mariposa, Mono, Nevada, Placer, Plumas, Sierra, Tulare, and Tuolumne counties, California (USFWS 2016c). On August 5, 2008, the USFWS published the current Final Rule designating approximately 417,577 acres of land as critical habitat for the Sierra Nevada bighorn sheep in Tuolumne, Mono, Fresno, Inyo, and Tulare counties, California (USFWS 2008).

USFWS-designated critical habitats for Sierra Nevada yellow-legged frog (*Rana sierrae*), and Sierra Nevada bighorn sheep (*Ovis canadensis sierrae*) occur and overlap a small portion of the Project's FERC boundaries (Figure 5-21) in the vicinity of the Project. Critical Habitat for Yosemite toad (*Anaxyrus canorus*) does not overlap the Project FERC boundary, but does occur west of the Project (Figure 5-21).

There is overlap in the critical habitat designations for the Sierra Nevada yellow-legged frog and the Sierra Nevada yellow-legged frog. Critical Habitat for the Sierra Nevada yellow-legged frog overlaps the Project FERC boundary just south of South Lake (Figure 5-21). Critical habitat for Sierra Nevada bighorn sheep overlaps with the Project FERC boundary east of Longley Lake.

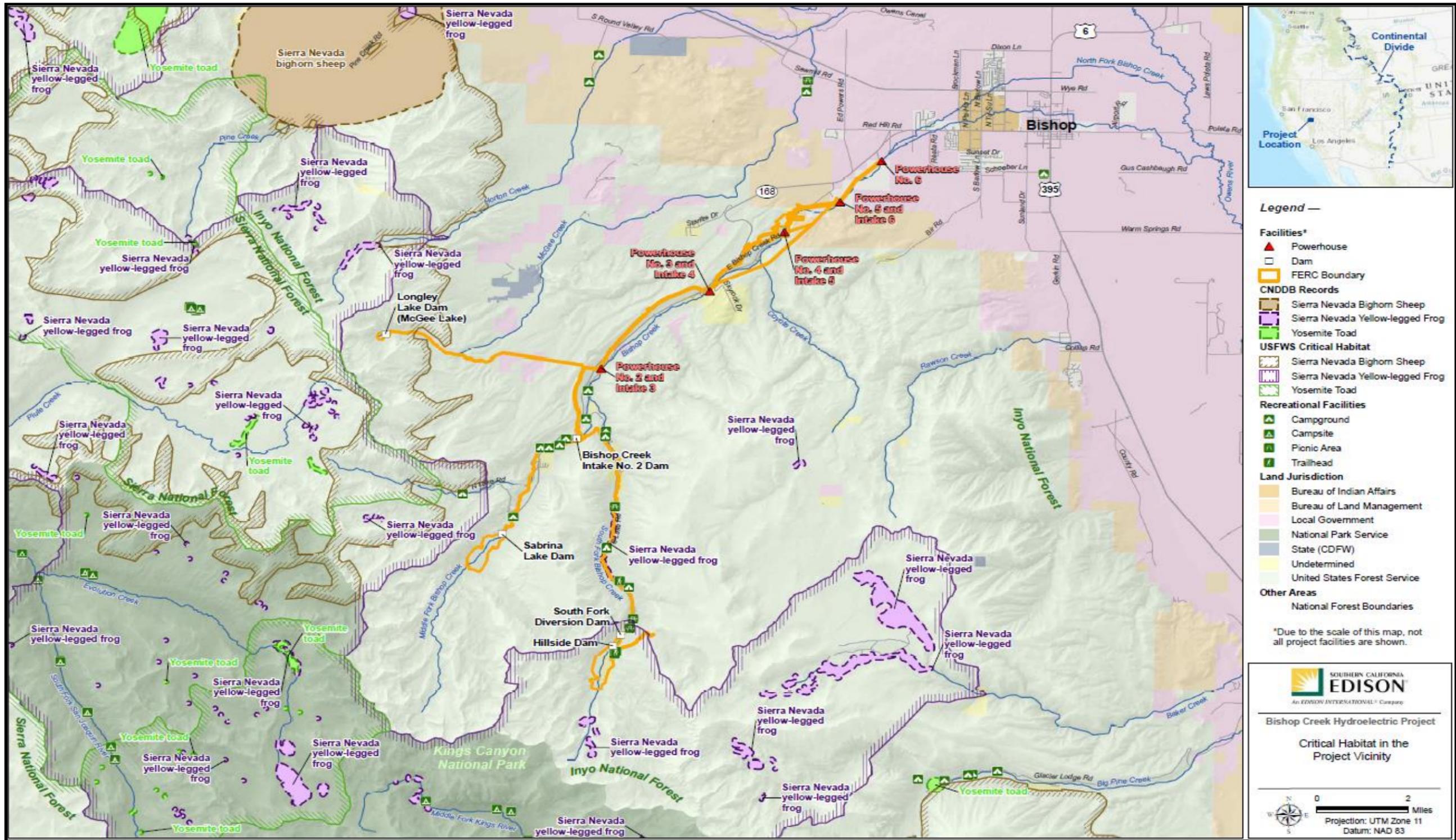


FIGURE 5-21 CRITICAL HABITAT IN THE PROJECT VICINITY

5.5.5 References

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