TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF MAPS

LIST OF ACRONYMS

°	degrees
ECSZ	Eastern California Shear Zone
FERC	Federal Energy Regulatory Commission
Forest Service	United States Forest Service
km	kilometer
msl	mean sea level
NRCS	Natural Resources Conservation Service
NRP	Northern Ritter Range Pendant
NSLF	Northern Silver Lake Fault
Project	Rush Creek Project
SCE	Southern California Edison Company
SSLF	Southern Silver Lake Fault
USGS	United States Geological Survey
Watershed	Rush Creek Watershed
WSE	water surface elevation

4.7 GEOLOGY AND SOILS

This section describes the geology and soils in the Rush Creek Watershed (Watershed), as they pertain to Southern California Edison Company's (SCE) Rush Creek Project (Project). The Federal Energy Regulatory Commission's (FERC) content requirements for this section are specified in Title 18 of the Code of Federal Regulations Chapter I § 5.6(d)(3)(ii).

As required, this section describes: (1) the regional geologic setting, including a description of the geologic features in the vicinity of the Project, bedrock lithology, structural and glacial features, unconsolidated deposits, mineral resources, and seismicity; (2) the soils in the vicinity of the Project, including types, distribution (occurrence), characteristics, and erodibility, and potential for mass soil movement; and (3) the reservoir shorelines, including steepness, composition, vegetative cover, existing erosion, mass soil movement, slumping, or other forms of instability. In addition, this section identifies reservoir operations that are known to or may cause erosion and soil instability. Streambanks, including existing erosion and instability along the Project-affected reaches, are discussed in Section 4.8, Geomorphology.

4.7.1 Information Sources

This section was developed using existing data and information available in the following information sources:

- Application for License for Major Project – Existing Dam, Project No. 1389. Rush Creek Project (SCE 1981);
- Environmental Assessment for Hydropower License – Rush Creek (FERC 1992);
- Mono County General Plan (Mono County 2015);
- Geologic Structure and History of the Sierra Nevada (Bateman 1968);
- Dam Safety Inspection Report (FERC 2020);
- Silver Lake Fault Evaluation (AMEC 2011);
- Geotechnical Engineering Investigation Report, Southern California Edison Gem Lake Arch 8 Valve/New Foundation, Gem Lake, California (BSK Associates 2020);
- Plan for Control of Erosion, Stream Sedimentation, Soil Mass Movement, and Dust (SCE 1997);
- Wilderness Connect (University of Montana 2021);
- Interactive Web Maps (CGS 2010a);
- Fault Activity Map of California (CGS 2010b);

- Earthquake Hazards Program (USGS 2018);
- Northern California Earthquake Data Center (USGS 2021a);
- Mineral Resources Data System (USGS 2021b); and
- Soil Web (NRCS 2020).

4.7.2 Physiographic Setting

The Project is located on the eastern face of the central Sierra Nevada, in Mono County, California. The Project facilities are located on Rush Creek, which begins near Mt. Lyell and drains due east, then northeastward, discharging into Mono Lake, which is located approximately 14 miles north-east of the Rush Creek Powerhouse. The primary Project features, Rush Creek, and Mono Lake are shown on Map 4.7-1.

Rush Creek crosses the boundary of two physiographic provinces, each with distinct landforms. The upper part of Rush Creek and the Project dams and reservoirs are located in the Sierra Nevada physiographic province, which generally consists of a north-to-south elongated mountain range that extends approximately 400 miles from the Mojave Desert in the south to the Cascade Range in the north. The lower part of Rush Creek and Mono Lake are located in the Basin and Range physiographic province, which continues eastward through most of western North American and is generally comprised of closed drainage basins in fault-bound valleys separated by mountain ranges. The boundary between the two provinces forms a steep escarpment that dominates the landscape in the vicinity of the Project. The Rush Creek Powerhouse is located at the boundary of the two provinces, capitalizing on the elevation difference formed by the escarpment.

The landscape surrounding the Project facilities is characterized by steep and rugged terrain and topographic relief in the vicinity of the Project is dramatic. Waugh Lake Dam is situated at approximately 9,419 feet mean sea level (msl) and the Rush Creek Powerhouse is located at 7,253 feet msl. The ridges and peaks surrounding the Project to the west, north, and south reach elevations of over 13,000 feet msl, making them some of the highest in California. The summit of Mt. Lyell, located at the western end of the watershed boundary, is 13,114 feet msl. Carson Peak, located at the southern end of Agnew Lake is 10,908 feet msl. Topography in the vicinity of the Project is shown on Map 4.7-2.

4.7.3 Geologic Setting

The Sierra Nevada is composed mainly of Mesozoic granitic rocks and Paleozoic and Mesozoic metamorphosed sedimentary and volcanic rocks.[1] The granitic rock base of the Sierra Nevada formed during the Mesozoic Era, intruding older (Mesozoic and Paleozoic) sedimentary and volcanic rocks. During and following the emplacement of the granitic rock, the Sierra Nevada was uplifted and eroded. During the Eocene and the Oligocene, the range began to tilt westward, and during the Pliocene the east side was uplifted by

[1] A generalized geologic time scale is provided in Table 4.7-1 for reference.

tilting to its present height (Bateman 1968). The older sedimentary and volcanic rocks were eroded as the range uplifted, but erosional remnants referred to as “roof pendants” can be seen capping the granitic ridges and peaks surrounding the Project. Rush Creek bisects a long, narrow roof pendant associated with the Ritter Ridge roof pendants (BSK Associates 2020).

The period of uplift was followed by the Pleistocene Epoch, sometimes referred to as the “Ice Age”. During the Pleistocene, glaciers formed and moved downslope, creating broad U-shaped valleys and other glacial features. These features are visible in the vicinity of the Project as discussed in Section 4.7.5.

Younger volcanic material overlies the granitic block-faulted structure of the Sierra Nevada and relatively young volcanic rocks are common in the valley immediately east of the Project. The distribution of Cenozoic volcanic material (primarily rhyolite and tephrite) in the vicinity of the Project is shown on Map 4.7-3.

The area immediately east of the Project is considered volcanically active and some of the prominent features associated with this activity, including the Mono-Inyo Craters and Long Valley Caldera, are shown on Map 4.7-3. Over the past 2,000 years, volcanic eruptions have occurred at an average rate of one per 100 years (Mono County 2015). Movement in the Long Valley Caldera has caused numerous earthquakes. Since 1974, the United States Geological Survey (USGS) has conducted ongoing monitoring of the caldera for volcano surveillance (earthquakes often serve as an early sign of volcanic unrest). Earthquake swarms occurred at Long Valley from 1978–1983, 1990–1995, 1996, and 1997–1998. The USGS indicates that the rate of earthquakes in recent years has been relatively low compared with the history since seismic monitoring started (Mono County 2015). Seismicity in the region is discussed in further in Section 4.7.8.

4.7.4 Bedrock Lithology

The general geologic rock types in the vicinity of the Project as mapped by the USGS are shown on Map 4.7-3. As indicated, Waugh Lake and Rush Meadows Dam are primarily underlain by Mesozoic granodiorite and limestone. Gem Lake and Dam are underlain by Mesozoic felsic (iron-bearing) and intermediate volcanic rocks, along with older (Paleozoic) argillite. Agnew Lake and Dam are underlain by older (Paleozoic) argillite. The Rush Creek Powerhouse is underlain by Mesozoic granodiorite and a localized deposit of glacial till.

4.7.5 Glacial Features

The Sierra Nevada was glaciated several times during the Pleistocene. Glacial events alter the landscape by eroding and polishing the bedrock, and creating steep-sided, U-shaped valleys and other glacial features such as cirques.[2] These cirques are evident

[2] A cirque is steep-sided, bowl-shaped feature located at the head of a valley or on a mountain side formed by glacial erosion.

in the topography shown on Map 4.7-2 and many of the small lakes in the vicinity of the Project occupy cirques.

When glaciers advance, they “pluck” rock and abrade fragments from the underlying bedrock. This material is carried along in the glacier and deposited along the sides and terminus of the glacier. When the glacier retreats, these deposits are exposed and are referred to as lateral and terminal moraines, respectively. Moraine sequences from up to six different glacial periods are recognized in the vicinity of the Project (AMEC 2011) but there are no large moraines in the immediate vicinity of the Project. The powerhouse is located on glacial material (FERC 1992). Otherwise, the primary glacial deposits in the vicinity of the Project are located downslope of the Project, to the north and south of Silver Lake and surrounding Grant Lake. Glacial deposits as mapped by the USGS are shown on Map 4.7-3, identified in the legend as “glacial drift”.

Active glaciers are present in the higher elevations of the Sierra Nevada, including in the vicinity of the Project. An example is Lyell Glacier, which lies on the north slope of Mt. Lyell, at the western boundary of the Rush Creek drainage.

4.7.6 Unconsolidated Sediments

The Project facilities are located in steep, rugged terrain dominated by exposed glaciated granitic bedrock with sparse vegetation. Unconsolidated sediments in the immediate vicinity of the Project are generally limited to a thin layer of surface soil on bedrock, and recent alluvium deposited in the stream and river courses. Due to the steep terrain, talus is common along Rush Creek and along the reservoir shorelines. Significant amounts of talus are present on the denuded north slope of Carson Peak, located at the south end of Agnew Lake. Sediment supply and potential for mass wasting is discussed in Section 4.8, Geomorphology.

4.7.7 Structural Features

The geologic rock types and structures in the immediate vicinity of the Project are typical of the Sierra Nevada, dominated by glaciated granitic rocks, some of which are capped by roof pendants. Gem Lake is located within the Northern Ritter Range pendant (NRP), one of the many roof pendants found in the Sierra Nevada batholith. The NRP strata generally strikes to the northwest, dips steeply to the southwest, and becomes younger to the southwest (BSK Associates 2020). Otherwise, there are no significant structural features in the immediate vicinity of the Project facilities. The most prominent structural feature in the vicinity of the Project is the escarpment formed at the boundary of the Sierra Nevada and Basin and Range provinces.

Immediately east of the Project, the landscape is dominated by Pleistocene-Holocene volcanic structures and features such as domes, tephra cones, lava flows, and laterally extensive pumice plains (AMEC 2011). Some of these features are so unique they are protected under various state and federal programs (Mono County 2015).

4.7.8 Faulting and Seismicity

The steep escarpment between the Sierra Nevada and the adjacent valley occurs due to faulting along the base of the Sierra Nevada. The fault zone along the east side of the Sierra is known as the Eastern California Shear Zone (ECSZ) but is also referred to as the Sierra Nevada frontal fault system. The ECSZ along with the San Andreas Fault system account for most of the movement between the Pacific and North American tectonic plates. About 10 millimeters of slip occurs on the faults on the east side of the Sierra each year (Mono County 2015).

According to the Mono County General Plan, Mono County is located at a stress point, where the earth's crustal plates exert opposite pressures against each other. This combination creates both "tectonic" earthquakes (land mass movement) and volcanic activity that can trigger earth shaking. The primary seismic hazard in the County is strong to severe ground shaking. The County is in Seismic Zone 4, which has an associated ground acceleration of 0.40 ‘g’ and requires stringent engineering and construction for new and existing structures (Mono County 2015).

Earthquakes occur regularly in the Eastern Sierra, especially in the Long Valley area. Most of the earthquakes are under magnitude 3 and are, therefore, too weak to be felt by people. In Mono County, the largest earthquake in recent history occurred on July 21, 1986, when a magnitude 6.2 occurred in the Chalfant Valley near Bishop. Associated seismic and geologic hazards such as landslides, rockfalls, and ground failure have occurred in conjunction with earthquakes (Mono County 2015). Map 4.7-4 shows earthquake epicenters in the vicinity of the Project organized by magnitude based on data acquired from the Northern California Earthquake Data Center (USGS 2021a).

Within the Mono Basin, there are three main fault systems that can be considered constituents of the greater Sierra Nevada frontal fault system. These faults are referred to as the Hartley Springs Fault zone, the Mono Lake Fault, and the Silver Lake Fault. The location of these three faults relative to the Project facilities are shown on Maps 4.7-3 and 4.7-4.

The Mono Lake Fault is a normal or oblique normal fault that extends northward from near Lee Vining to near Conway summit, a distance of 19 kilometers (km) (approximately 12 miles) (AMEC 2011). This fault, or a branching fault directly connected to it, was probably responsible for the magnitude 5.8 Lee Vining earthquake that occurred on October 24, 1990. Studies suggest that this fault is capable of producing earthquakes up to about magnitude 6.5 (AMEC 2011).

The Hartley Springs Fault is a north to north-west trending oblique normal fault that extends approximately 25 km (about 15.5 miles) from the Long Valley Caldera to the vicinity of the Aeolian Buttes. Earthquake hypocenters near the Hartley Springs Fault suggest a relatively shallow fault compared to other faults in the area. The relatively shallow depth may be the result of magmatic intrusion near the Long Valley Caldera and along the Mono-Inyo Craters volcanic chain. Studies suggest that this fault is capable of producing earthquakes up to about magnitude 6.4 (AMEC 2011).

As indicated on Map 4.7-3, the Silver Lake Fault crosses through the FERC Project boundary in the vicinity of the Rush Creek Powerhouse. The Silver Lake Fault consists of two segments referred to as the Southern Silver Lake Fault (SSLF) and the Northern Silver Lake Fault (NSLF). Both are right-lateral oblique normal faults. Combined, they extend from the Long Valley Caldera to an uncertain location west of Mount Warren a total distance of about 35 km (about 22 miles). In contrast to the Hartley Springs and Mono Lake Faults, evidence for Quaternary activity is relatively scarce and, in most cases, ambiguous (AMEC 2011). Based on the uncertainty in slip history, both segments of the fault are considered by the Division of Safety of Dams to be conditionally active, meaning it is Quaternary active (within the last 2.6 million years), but its displacement history during the last 35 thousand years is not known well enough to determine activity or inactivity. Studies suggest that the SSLF and NSLF are capable of producing earthquakes up to about magnitude 6.5 and 6.3, respectively (AMEC 2011).

4.7.9 Mineral Resources

Historic and current mining activity in the Watershed is shown on Map 4.7-5. As indicated, there are no known historic or active mines located within the FERC Project boundary or in the immediate vicinity of the Project. An occurrence of copper has been identified upstream of the Project near Marie Lakes and occurrences of tungsten, lead, zinc, and silver have been identified east of the Project, near Gull Lake. Mineral extraction in the vicinity of the Project has been limited to sand and gravel for construction purposes. Past production of sand and gravel occurred at June Lake and on Rush Creek downstream of Grant Lake. Sand and gravel is currently being produced along Rush Creek downstream of Grant Lake.

4.7.10 Soils

Soils found within 0.5 mile of Project facilities and associated Project-affected reaches are shown on Map 4.7-6 and a description of the soil units shown on Map 4.7-6 is provided in Table 4.7-2. The information presented on the Map 4.7-1 and in Table 4.7-2 is based on detailed soil information developed by the United States Department of Agriculture Natural Resources Conservation Service (NRCS 2020). Additional detailed information about the soils in the vicinity of the Project is available at https://casoilresource.lawr.ucdavis.edu/gmap/.

In general, the soils shown on Map 4.7-6 can be classified into the following categories, based primarily on factors that pertain to the parent material from which the soil is derived:

- Alluvium, colluvium, or till derived from granodiorite;
- Colluvium derived from granite and residuum weathered from granite;
- Residuum weathered from volcanic rocks (andesite, rhyolite and/or basalt);

- Pumice and/or residuum weathered from obsidian; and
- Alluvium, colluvium, and/or till derived from metavolcanics.

Large expanses of bedrock with no soil are exposed throughout the region. Where present, soils are generally thin, with minimal organic material, especially below about 20 centimeters.

The soils in the vicinity of the Project range from poorly drained to excessively drained and runoff potential ranges from low to very high. With one exception, none of the soils in the vicinity of the Project are hydric.[3] The exception are the Conway soils that underlie the meadow complex located immediately east of the Rush Creek Powerhouse. These soils are comprised of volcanic ash and alluvium derived from granite.

The pH of a soil is a numerical expression of soil reaction. The pH of the soils in the vicinity of the Project is shown on Table 4.7-2. As indicated, the soils in the vicinity of the Project are slightly acidic (pH 6.1–6.5) to very strongly acidic (pH 4.5–5.0). In general, soils that are either highly alkaline or highly acid are likely to be corrosive to steel. Soils that have pH <5.5 are likely to be corrosive to concrete. Soils that have a pH of approximately 6 or 7 generally have the most readily available plant nutrients (NRCS 2020).

One of the parameters used by the NRCS in assessing the susceptibility of a soil to erosion is the K Factor. This factor assesses the susceptibility of the soil to sheet and rill erosion and is dependent upon the percentages of clay, silt, sand, and organic matter in the soil. Values range from 0.02 for the least erodible soils to 0.64 for the most erodible soils. The K Factor for each of the soil types in the vicinity of the Project are provided on Table 4.7-2. As indicated, K factors for the soils underlying Project facilities range from 0.05 to 0.39, meaning they have fairly low susceptibility to erosion when there is minimal vegetative cover. Areas with good vegetative cover would have a lower overall potential for erosion.

4.7.11 Reservoir Shorelines

This section describes the reservoir shorelines/varial zones associated with the Project, including (1) steepness, composition (bedrock and unconsolidated deposits), and vegetative cover; and (2) existing potential erosion issues and Project facilities and/or operations that are known to or may cause these issues. Streambanks, including a description of the channel characteristics and conditions in Project-affected reaches, is provided in Section 4.8, Geomorphology.

[3] A hydric soil is a soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part. Hydric soils along with hydrophytic vegetation and wetland hydrology are used to define wetlands.

4.7.11.1 Waugh Lake

Waugh Lake is situated in undeveloped, high elevation wilderness and is completely rimmed by low to moderately sloping outcrops of glaciated granitic rock. On the north side of the lake, slopes average about 15 degrees. The west end of the reservoir is bounded by gentle topography with mountains sloping 9 degrees. The south side of the reservoir is also bordered by gentle mountain sloped ranging from about 5–10 degrees (SCE 1981). Vegetation surrounding the reservoir consist primarily of widely scattered lodgepole pine and willow. This coniferous forest community is characterized by open stands of trees with sparse litter accumulation and little shrub or herbaceous understory (FERC 1992).

The reservoir has historically been operated to fill in the spring and summer and completely drain in the late fall and winter. As a result, the reservoir virial zone, in this case the entire reservoir footprint, is both inundated and exposed annually and consists of mineral substrate (rock, sediment) with minimal vegetation (see below). Sediment within the reservoir primarily consists of fine to medium grained decomposed granite, with intermittent deposits of granitic cobbles and boulders derived from the surrounding slopes. There are large sections of the reservoir footprint that consist of bedrock and coarse rocky material, particularly in the upstream portion of the reservoir and along the margins of the inundated reservoir footprint.

The FERC conducted an inspection at Waugh Lake in 2019 (FERC 2020). At the time of the inspection, Waugh Lake was essentially drained revealing the reservoir bottom consisting of a mixture of fine and course sediments. The inspection report identified the potential when the reservoir is drained for siltation, dead tree stumps, and debris from the Watershed to flow down the creek and affect the low-level outlet trash rack (FERC 2020) (note: historically the reservoir has operated in the drained condition from late fall through early spring with limited issues). Some sporadic debris, particularly small tree limbs and logs, were observed deposited around the reservoir inlet to the low-level outlet or near the cut notch spillway were observed during the inspection. SCE debris removal options are generally limited to hand tools due to regulatory restrictions in the wilderness (FERC 2020).

Waugh Lake was previously operated at a higher maximum water surface elevation (WSE). However, in 2012 the maximum operating WSE was reduced by 24 feet to ameliorate seismic safety concerns. The spillway was notched in 2018 by approximately 19 feet to help in maintaining the lower operating WSE. As summarized on Table 4.7-3, the lower maximum WSE also reduced the typical reservoir surface area by 55 acres. The lower typical operating level and smaller overall footprint has allowed a portion of the shoreline that was historically inundated begin to naturally revegetate (Figure 4.7-1). Limited sediment has accumulated in the reservoir since the reservoir was constructed (Figure 4.7-1) (see Section, 4.8 Geomorphology). During seasons when the reservoir is drawn down, it is possible that some areas of the reservoir footprint could be vulnerable to erosion. Otherwise, Project operations do not cause erosion, mass soil movement, slumping, or other forms of instability at Waugh Lake.

4.7.11.2 Gem Lake

Gem Lake is also situated in undeveloped, high elevation wilderness. The terrain around the lake consists of granite and the metasediments/metavolcanics that comprise the NRP (described above). Slopes vary from about 12–23 degrees, with the steepest slopes on the northwest and southeast (SCE 1981). The shoreline is generally steep and rocky, with intermittent talus deposits. A large talus deposit is present along the southern shoreline, derived from the steep ridgeline located immediately south of the lake.

Similar to Waugh Lake, the vegetation surrounding the reservoir consists primarily of widely scattered lodgepole pine and willow, characterized by open stands of trees with sparse litter accumulation and little shrub or herbaceous understory (FERC 1992). The shoreline and slopes along the western and southern ends of the reservoir are more densely vegetated than the shoreline and slopes on the eastern side of the reservoir. The difference in vegetation density may be controlled by the underlying rock types.

The FERC conducted an inspection at Gem Lake in 2019 (FERC 2020). According to the report, the reservoir was generally free from signs of erosion. Indications of landslide or rockfall were similarly not observed (FERC 2020).

Similar to Waugh Lake, Gem Lake was previously operated at a higher WSE. However, in 2012, the typical maximum operating WSE was reduced by 24.1 feet due to seismic safety concerns. As summarized on Table 4.7-3, the lower maximum WSE also reduced the reservoir surface area by 26 acres. Although the overall change in WSE is nearly the same as that in Waugh Lake, the change in surface area is much smaller at Gem Lake due to the steeper shoreline. The lower operating level has allowed a small portion of the shoreline varial zone that was historically inundated less to begin to naturally revegetate (Figure 4.7-2), but only in select areas where there is water and/or suitable soils. Generally, the reservoir shoreline is dominated by bedrock and when the reservoir is drawn down in the late fall/winter the rocky nature of the reservoir prevents the exposed shoreline from being vulnerable to erosion. Project operations do not cause erosion, mass soil movement, slumping, or other forms of instability at Gem Lake.

4.7.11.3 Agnew Lake

The terrain around Agnew Lake is considerably steeper and more rugged than the upstream areas. Slopes on the northwest side of the lake are about 40 degrees with 1,090 feet of vertical relief. Carson Peak towers above Agnew Lake on the southeast side with vertical relief of 2,400 feet and slopes of 35 degrees (SCE 1981). The shoreline is characterized by exposed bedrock and talus slopes. Due to the steep slopes, most of the shoreline and surrounding slopes are nearly void of vegetation, with sparse vegetation limited primarily to the northwest end of the reservoir. Significant talus deposits are present on the north and west flanks of Carson Peak, which bounds the south end of the reservoir. The course sediment that is present along the southwestern shoreline is derived from this source. There is an inlet delta in Agnew Lake that is derived from the inflow of Rush Creek and a small unnamed tributary, which is composed of finer sediment than the rest of the shoreline.

The FERC conducted an inspection at Agnew Lake in 2019 (FERC 2020). At the time of the inspection, the upstream reservoir appeared in satisfactory condition; some residual stumps remained in the dewatered areas of the reservoir which had likely been part of the original grubbing of the area. No signs of unstable slopes, rockslides, or landslides were observed in the upstream reservoir or adjacent slopes and debris in the upstream reservoir was negligible (FERC 2020).

Similar to Waugh and Gem lakes, Agnew Lake was previously operated at a higher WSE. However in 2012, the maximum operating WSE was reduced by approximately 26 feet to "no storage" on the dam due to seismic safety concerns. As summarized in Table 4.7-2, the lower maximum WSE reduced the reservoir surface area by 17 acres down to the natural lake size without the dam (notches were cut into the bottom of the dam to allow water to bypass the dam). Although the overall change in WSE is greater than at Waugh and Gem lakes, the change in surface area is smaller at Agnew Lake, indicative of the smaller reservoir size. The exposed shoreline is typically without vegetation due to the coarse/bedrock substrate and the historic varial zone. The inlet delta, however, has significantly revegetated in recent years due to the seismic restrictions (Figure 4.7-3). The coarse substrate/bedrock nature of the exposed shoreline generally eliminates the potential for erosion along the shoreline. Project operations do not cause erosion, mass soil movement, slumping, or other forms of instability at Agnew Lake.

4.7.12 Current Erosion Management

As required by FERC License Article 402 and United States Forest Service (Forest Service) 4(e) Condition No. 10, SCE prepared a Plan for Control of Erosion, Stream Sedimentation, Soil Mass Movement, and Dust for the Project (SCE 1997). The Plan was filed with FERC on October 15, 1997, and subsequently approved by FERC on November 14, 1997 (FERC 1997).

The Plan provides general measures to control erosion, stream sedimentation, soil mass movement, and dust occurring as the result of planned small-scale construction associated with normal operation of Project facilities, and provides the basis for the formulation of specific measures which will be addressed on a case-by-case basis with the Forest Service to cover accidental occurrences such as a pipeline rupture (SCE 1997).

General measures to reduce erosion and sedimentation resulting from construction activities include grading and contouring, construction of erosion-control structures, use of water bars and sediment fences, slope stabilization, revegetation, and monitoring. Measures to reduce sedimentation from sediment removal activities (e.g., from forebays and impoundments); measures for remediation of major land movements (e.g., from rupture of flow lines or slope failures); and measures for dust control are also included in the Plan (SCE 1997).

4.7.13 References

AMEC (AMEC Geomatrix, Inc.). 2011. Silver Lake Fault Evaluation, Mono County, California.

Bateman, Paul C. Geologic Structure and History of the Sierra Nevada. 1968. UMR Journal – V.H. McNutt Colloquium Series. Article 8. April 1968.

BSK Associates. 2020. Geotechnical Engineering Investigation Report. Proposed New Foundation for Valve Replacement Southern California Edison Gem Lake Arch 8 Valve, Gem Lake, California. April 21, 2021.

CGS (California Department of Conservation, California Geological Survey). 2010a. Interactive Web Maps. Available at https://maps.conservation.ca.gov/cgs/. Accessed July 2021.

———. 2010b. Fault Activity Map of California. Available at: https://www.conservation.ca.gov/cgs/publications/fault-activity-map-of-california.

FERC (Federal Energy Regulatory Commission). 1992. Environmental Assessment for Hydropower License, Rush Creek, Project No. 1389-001, California. May 5, 1992.

———. 1997. Order Issuing New License, Rush Creek Project. FERC Accession No. 19970210-0301. 78 FERC ¶ 61,109. February.

———. 2020. Dam Safety Inspection Report. FERC Office of Energy Projects. Division of Dam Safety and Inspections. San Francisco Regional Office. Filed April 7, 2020. Accession No. 20200407-3095.

Mono County. 2015. Mono County General Plan Update. Available at: https://monocounty.ca.gov/planning/page/general-plan

NRCS (United States Department of Agriculture, Natural Resources Conservation Service). 2020. Soil Web. Hosted by University of California, Davis (UCD). Available at: https://casoilresource.lawr.ucdavis.edu/gmap/. Accessed July 2021.

SCE (Southern California Edison Company). 1981. Application for License for Major Project – Existing Dam, Project No. 1389. Rush Creek Project.

———. 1997. Plan for Control of Erosion, Stream Sedimentation, Soil Mass Movement, and Dust. Rush Creek Hydroelectric Project, FERC Project No. 1389. September.

SoilWeb. 2021. University of California, Davis, Agriculture and Natural Resources and USDA Natural Resources Conservation Service (NRCS). https://casoilresource.lawr.ucdavis.edu/gmap/. Accessed July 16, 2021.

University of Montana Wilderness Connect. 2021. Available at: Wilderness.net. Accessed July 2021.

USGS (United States Geological Survey). 2018. Earthquake Hazards Program. Available at: https://earthquake.usgs.gov/hazards/qfaults. Accessed July 2021.

———. 2021a. Northern California Earthquake Data Center (NCEDC). Hosted by the Berkeley Seismology Lab. Available at: ncedc.org. Accessed July 2021.

———. 2021b. Mineral Resources Data System. Available at: https://mrdata.usgs.gov/mrds/. Accessed July 2021.

TABLES

This Page Intentionally Left Blank

Table 4.7-1. Simplified Geologic Time Scale.*

Eon	Era	Period	Epoch	Years Before Present (MYA = Million Years Ago)
Phanerozoic (542.0 mya to present)	Cenozoic (65.5 mya to present)	Quaternary		**2.6 mya to present**
			Holocene	11,700 yrs to present
			Pleistocene	2.588 mya to 11,700 yrs
		Tertiary		**65.5 to 2.6 mya**
			Pliocene	5.332 to 2.588 mya
			Miocene	23.03 to 5.332 mya
			Oligocene	33.9 to 23.03 mya
			Eocene	55.8 to 33.9 mya
			Paleocene	65.5 to 55.8 mya
	Mesozoic (251.0 to 65.5 mya)	Cretaceous		**145.5 to 65.5 mya**
			Upper	99.6 to 65.5 mya
			Lower	145.5 to 99.6 mya
		Jurassic		**199.6 to 145.5 mya**
			Upper	161.2 to 145.5 mya
			Middle	175.6 to 161.2 mya
			Lower	199.6 to 175.6 mya
		Triassic		**251.0 to 199.6 mya**
			Upper	228.7 to 199.6 mya
			Middle	245.9 to 228.7 mya
			Lower	251.0 to 245.9 mya
	Paleozoic (542.0 to 251.0 mya)	Permian		**299.0 to 251.0 mya**
		Carboniferous		**359.2 to 299.0 mya**
		Devonian		**416.0 to 359.2 mya**
		Silurian		**443.7 to 416.0 mya**
		Ordovician		**488.3 to 443.7 mya**
		Cambrian		**542.0 to 488.3 mya**
Precambrian				

* Adapted from Geologic Time Scale, University of California Museum of Paleontology (http://www.ucmp.berkeley.edu/help/timeform.php)

This Page Intentionally Left Blank

Table 4.7-2. Description of Soils in the Vicinity of the Project

Code Corresponds to Map 4.7-5	Map Unit Name	Map Unit Type	Map Unit Composition			Hydraulic and Erosion Ratings				pH[3]
			Composition	Percent[1]	Geomorphic Position	Parent Material	Drainage	Runoff	Hydric Rating[2]	
111	Typic Cryorthents-Typic Cryochrepts-Rock outcrop complex (0 to 45% slopes)	Complex	Typic Cryorthents	40	moraines/footslope	Alluvium derived from granodiorite and/or colluvium derived from granodiorite and/or till derived from granodiorite	Well Drained	Medium	No	5.0
			Typic Cryochrepts	30	moraines/footslope	Colluvium derived from granodiorite and/or till derived from granodiorite		High	No	5.6
			Rock outcrop complex	20	mountains/summit	—		—	No	—
117/117 iw	Rock outcrop-Rubble land complex	Complexes	Rock outcrop	60	mountains/summit	—	Excessively drained	—	No	—
			Rubble land	20	mountains/backslope	—		—	No	—
129/129 bo	Berent-Glenbrook-Nanamkin families association (30 to 50% slopes)	Associations	Berent family	40	hills/backslope	Colluvium derived from granite and residuum weathered from granite	Somewhat excessively drained	Low	No	7.0
			Glenbrook family	30	hillsides/backslope	Colluvium and/or residuum weathered from granite		Very high	No	7.1
			Nanamkin family	15	hills/backslope	Colluvium derived from granite and residuum weathered from granite		Low	No	6.5
133	Corbett family-Rock outcrop-Railcity complex (5 to 30% slopes)	Complex	Corbett family	40	mountains/backslope	residuum weathered from granite and/or residuum weathered from rhyolite	Somewhat excessively drained	Low	No	5.0
			Rock outcrop	20	mountains/summit	—	Excessively drained	—	No	5.6
			Railcity family	15	mountains/summit	residuum weathered from andesite and/or residuum weathered from rhyolite	Somewhat excessively drained	Low	No	—
147	Rock outcrop-Typic Cryorthents complex (0 to 45% slopes)	Complex	Rock outcrop	60	mountains/summit	—	—	—	No	—
			Typic Cryorthents	30	mountains/backslope	alluvium derived from granite and/or colluvium derived from granite and/or till derived from granite	Well Drained	Medium	No	5.0
148	Rock outcrop-Typic Cryorthents complex (40 to 85% slopes)	Complex	Rock outcrop	70	mountains/summit	—	Well Drained	—	No	—
			Typic Cryorthents	25	mountains/backslope	colluvium derived from granite and/or till derived from granite		Medium	No	5.0
149	Nanamkin family-Vitrandic Haploxerolls complex, (15 to 30% slopes)	Complex	Nanamkin family	50	mountains/toeslope	residuum weathered from basalt and/or residuum weathered from granite	Somewhat excessively drained	Low	No	6.2
			Vitrandic Haploxerolls	30	mountains/toeslope	pumice and/or residuum weathered from obsidian		Low	No	6.6
150	Rock outcrop-Typic Cryorthents complex, volcanic (10 to 45% slopes)	Complex	Rock outcrop	55	mountains/summit	—	—	—	No	—
			Typic Cryorthents	40	mountains/backslope	alluvium derived from metavolcanics and/or colluvium derived from metavolcanics and/or till derived from metavolcanics	Well Drained	Medium	No	5.3

Code Corresponds to Map 4.7-5	Map Unit Name	Map Unit Type	Map Unit Composition			Hydraulic and Erosion Ratings				pH[3]
			Composition	Percent[1]	Geomorphic Position	Parent Material	Drainage	Runoff	Hydric Rating[2]	
170/170 bo	Conway-Conway cobbly-Chesaw family association (0 to 15% slopes)	Associations	Conway	35	alluvial fans/backslope fan terraces/backslope	volcanic ash and/or alluvium derived from granite	Poorly drained	Low	Yes	7.1
			Conway	30	alluvial fans/backslope	volcanic ash and alluvium derived from granite	Poorly drained	Low	Yes	7.1
			Chesaw family	15	alluvial fans/backslope fan terraces/backslope	alluvium derived from granite	Somewhat excessively drained	Very low	No	6.1
177/177 bo	Cryorthents-Rock outcrop complex, 30 to 50% slopes	Complexes	Cryorthents	60	mountains/backslope	colluvium derived from granite and residuum weathered from granite	Well Drained	Very high	No	6.1
			Rock Outcrop	25	mountains/plateaus	granite	—	—	No	—

Source: SoilWeb 2021

Notes:

[1] Remaining portions of map units that do not equal 100% are unnamed and/or undescribed.

[2] Indicates whether a soil is classified as a "hydric soil". A hydric soil is a soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part. Hydric soils along with hydrophytic vegetation and wetland hydrology are used to define wetlands.

[3] Descriptive terms for reaction and their respective ranges in pH are:

4.5–5.0	Very strongly acid
5.1–5.5	Strongly acid
5.6–6.0	Moderately acid
6.1–6.5	Slightly acid

Table 4.7-3. Change in Reservoir/Lake Physical Data after 2012 Specifications

Reservoir/Lake	Surface Area (acres)	Gross Storage Volume (ac-ft)	Max Operating Water Surface Elevation/ High Water Mark (feet)	Shoreline Length (miles)	Substrate Composition
Waugh Lake					
Pre-2012 Specifications	185	5,277	9,415.6	4.57	Silt, Sand, Rock, Bedrock
Post-2012 Specifications	130	1,555	9,392.1	4.40	Silt, Sand, Rock, Bedrock
Change	55	3,722	23.5	0.17	–
Gem Lake					
Pre-2012 Specifications	282	17,228	9,051.6	4.53	Silt, Sand, Rock, Bedrock
Post-2012 Specifications	256	10,752	9,027.5	4.63*	Silt, Sand, Rock, Bedrock
Change	26	6476	24.1	0.10	–
Agnew Lake					
Pre-2012 Specifications	40	1,379	8,495.88	1.39	Silt, Sand, Rock, Bedrock
Post-2012 Specifications**	23	569	8,470	1.24	Silt, Sand, Rock, Bedrock
Change	17	810	25.88	0.15	–

* Greater shoreline length at lower capacity due to less uniform shoreline with additional appearance of islands.

** Under the seismic restrictions Agnew Lake is a natural lake with no usable storage.

This Page Intentionally Left Blank

FIGURES

This Page Intentionally Left Blank

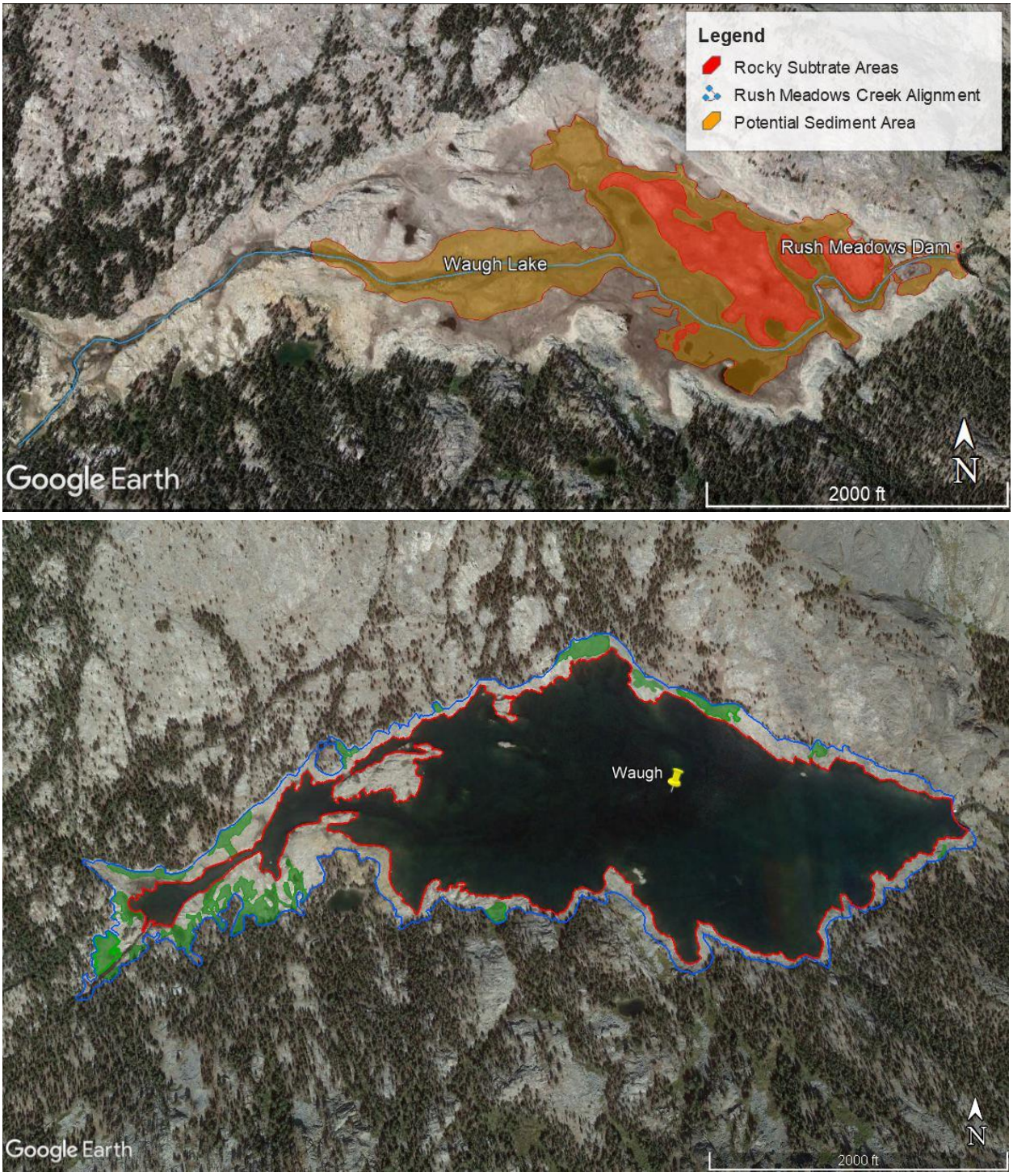


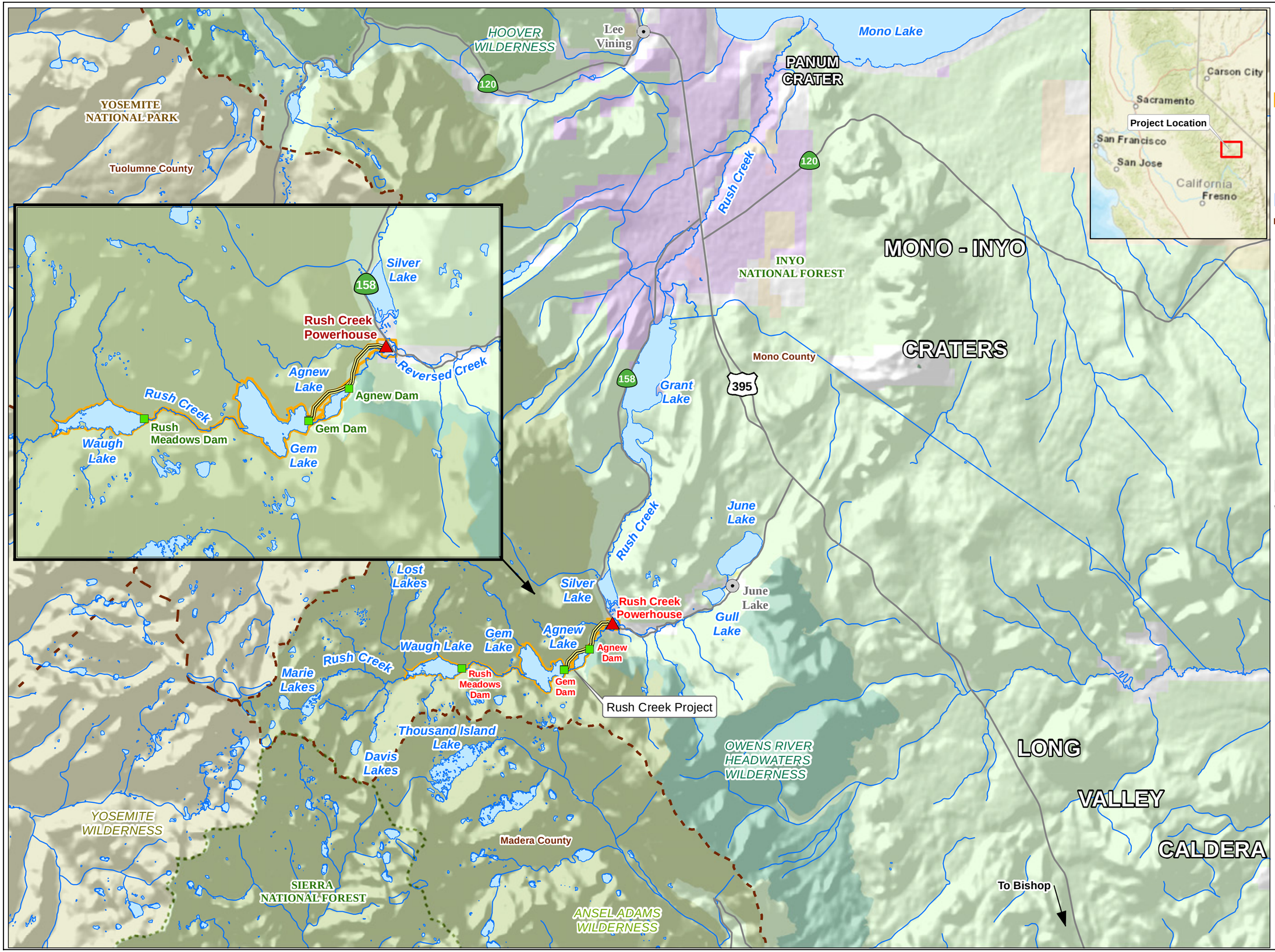
Figure 4.7-1. Waugh Lake footprint showing (top) the approximate outline of naturally revegetating areas (green) in the upper less frequently inundated varial zone due to the seismic restriction (water outlined in red is 9,394.2 feet) approximately 2.2 feet above the 9,392 seismic restriction and (bottom) areas of potential accumulated sediment.

Figure 4.7-2. Gem Lake varial zone showing some limited revegetation in the upper less frequently inundated zone due to the seismic restriction.

Figure 4.7-3. Agnew Lake varial zone revegetation in the inlet delta area due to the seismic restriction (left image 2013 and right image 2019).

MAPS

This Page Intentionally Left Blank



SCE Facilities

- Dam
- Powerhouse
- Flowline / Penstock
- FERC Boundary

Other Features

- Major City/Town
- Highway
- River/Stream
- Lake
- County Boundary

Land Jurisdiction and National Wilderness Areas/Parks*

- Local Government
- LADWP
- State Government
- Bureau of Land Management
- U.S. Forest Service
- Ansel Adams Wilderness (U.S. Forest Service)
- Hoover Wilderness (U.S. Forest Service)
- Owens River Headwaters Wilderness (U.S. Forest Service)
- Yosemite National Park / Yosemite Wilderness (National Park Service)
- Private (Blank)

*SOURCES: BLM, 2020.
Mono Co., 2019.
Wilderness.net, 2019.

SOUTHERN CALIFORNIA EDISON®
An EDISON INTERNATIONAL® Company

Rush Creek Project (FERC 1389)

Map 4.7-1

Overview of Vicinity of the Project

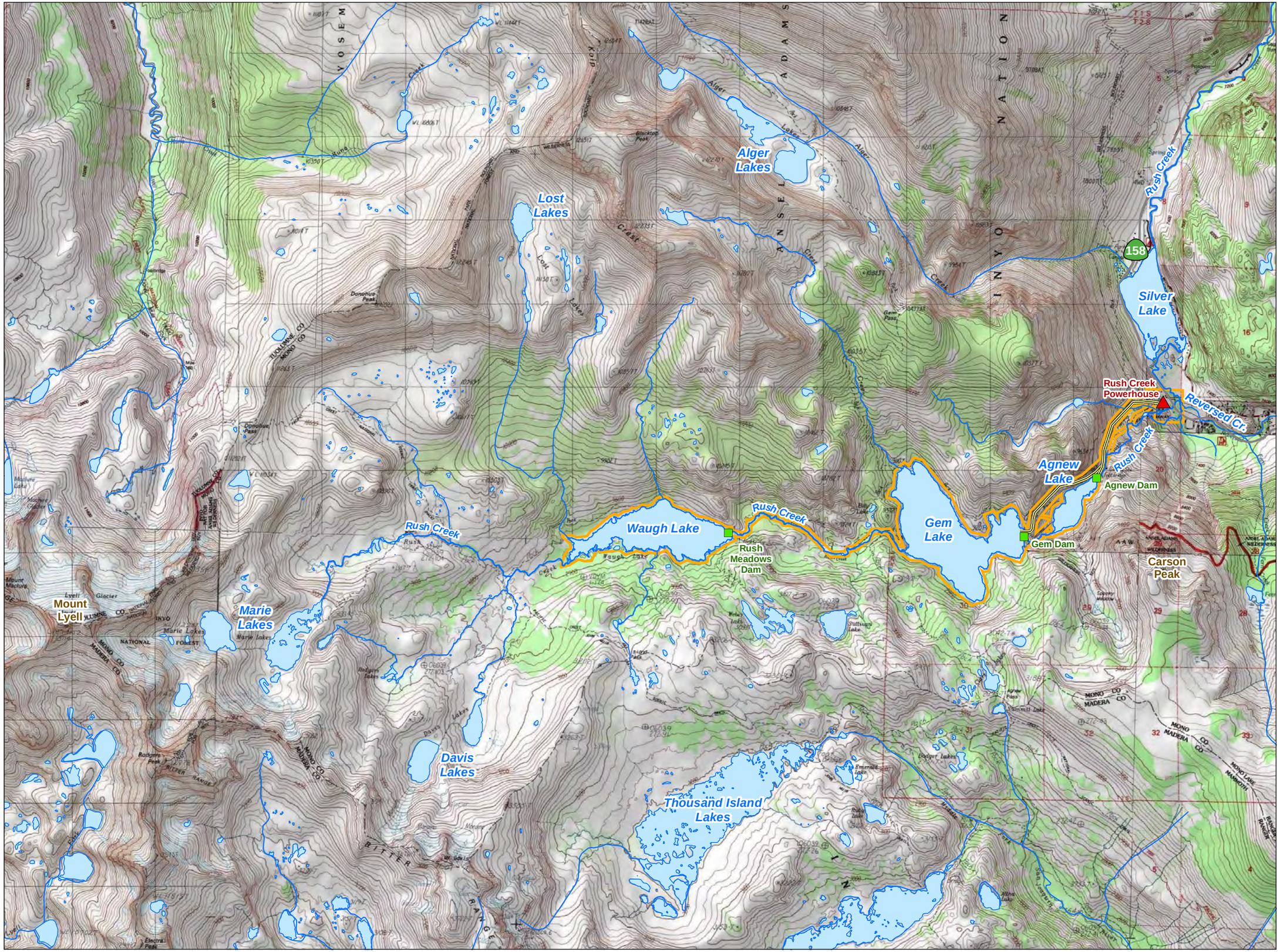
0 0.5 1 2 Miles

Date: 7/19/2021

Projection: UTM Zone 11
Datum: NAD 83

C:\GIS\Cardno\30735240_SCE_EasternHydro\map\Rush Creek\GeoMaps\SCE_RUSH_CREEK_Geo_Juris_17i11i_01.mxd

This Page Intentionally Left Blank



SCE Facilities

- Dam
- Powerhouse
- Flowline / Penstock
- FERC Boundary

Other Features

- Highway
- River/Stream
- Lake

SOUTHERN CALIFORNIA EDISON®
An EDISON INTERNATIONAL® Company

Eastern Hydro Generation

Map 4.7-2

Topography in the Vicinity of the Project

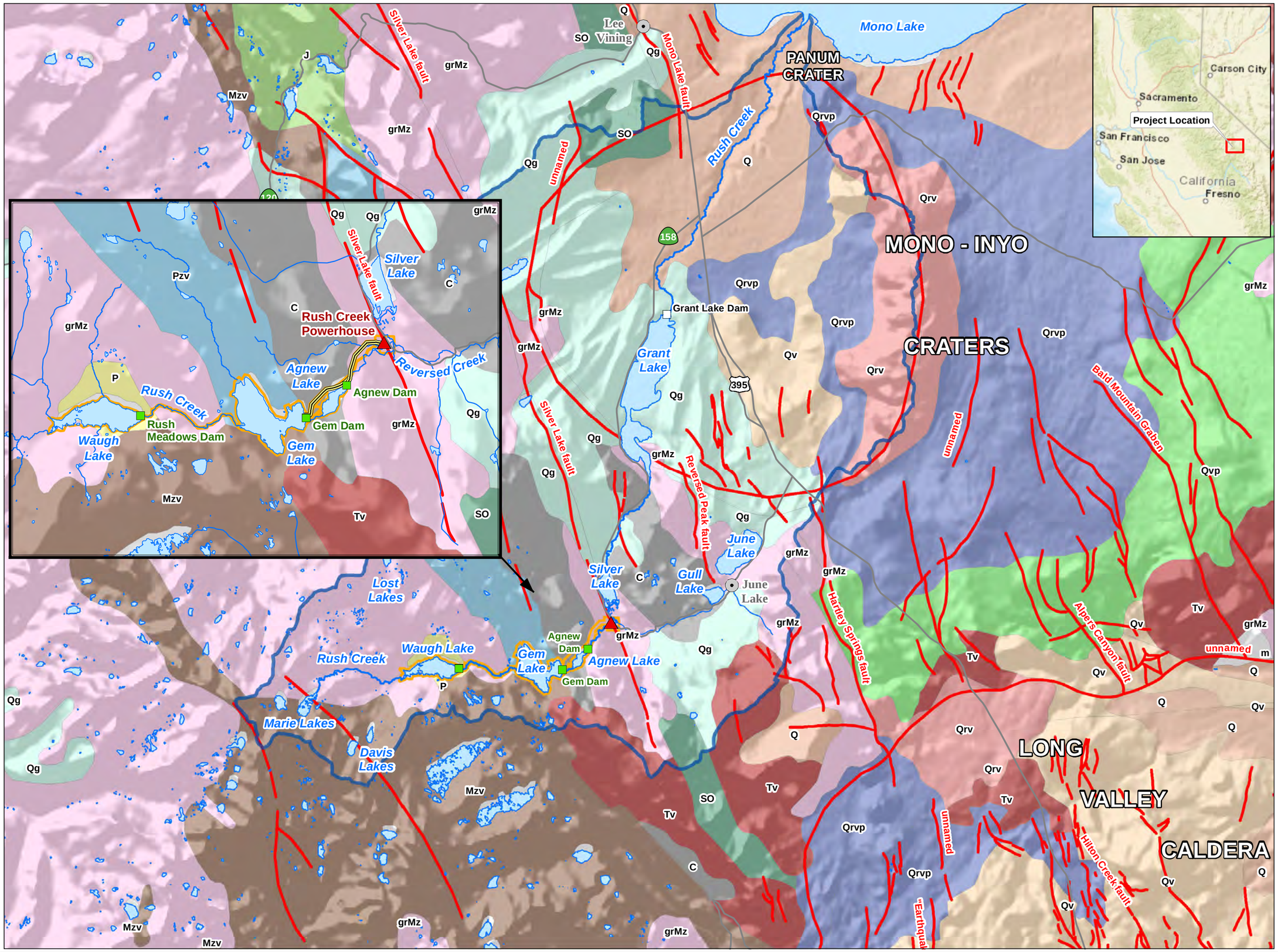
0 0.25 0.5 Miles

Projection: UTM Zone 11
Datum: NAD 83

Date: 7/19/2021

C:\GIS\Cardno\30735240_SCE_EasternHydro\map\Rush Creek\GeoMaps\SCE_RUSH_CREEK_Geo_Topo_17i11i_01.mxd

This Page Intentionally Left Blank



SCE Facilities

- Dam
- Powerhouse
- Flowline / Penstock
- FERC Boundary

Other Features

- Other Dam
- City/Town
- Highway
- River/Stream
- Lake
- Watershed Boundary

Fault Zone Data*

- Fault Line

*SOURCES: -- USGS, Earthquake Hazards Program, 2018
https://earthquake.usgs.gov/hazards/qfaults
-- California Geological Survey, 2010
https://maps.conservation.ca.gov/cgs/

Geologic Rock Types**

Cenozoic

- Q alluvium
- Qg glacial drift
- Qrv rhyolite
- Qrvp rhyolite
- Qv rhyolite
- Qvp rhyolite
- Tv tephrite (basanite)

Mesozoic

- grMz granodiorite
- J hornfels
- Mzv felsic volcanic rock
- P limestone
- Pzv intermediate volcanic rock

Paleozoic

- C argillite
- SO dolostone (dolomite)

**Source: Department of Conservation, California Geological Survey, 2010

SOUTHERN CALIFORNIA EDISON®
An EDISON INTERNATIONAL® Company

Rush Creek Project (FERC 1389)

Map 4.7-3

Geologic Rock Types and Faults in the Vicinity of the Project

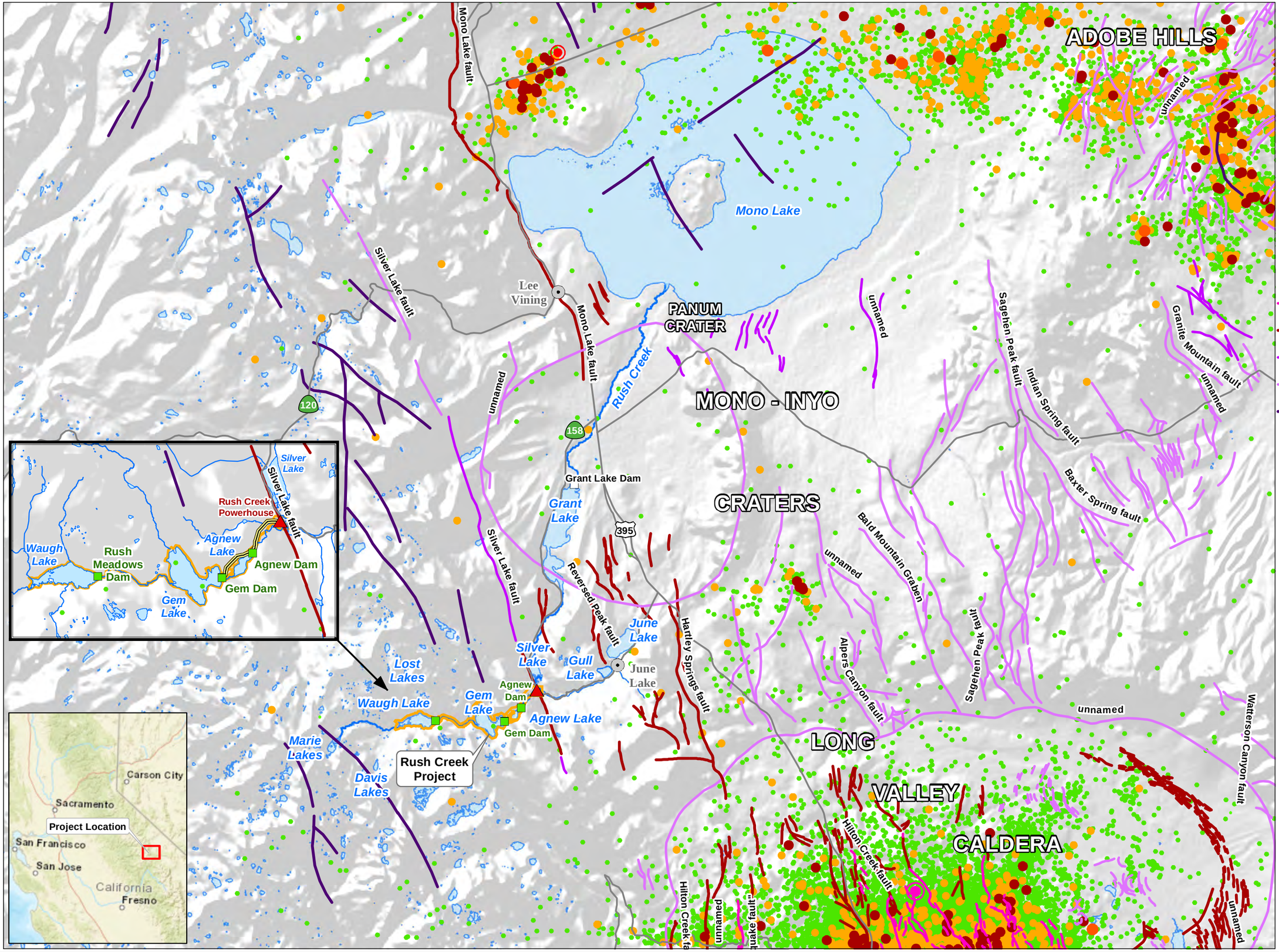
0 0.5 1 Miles

Projection: UTM Zone 11
Datum: NAD 83

Date: 7/19/2021

C:\GIS\Cardno\30735240_SCE_EasternHydro\map\Rush Creek\GeoMaps\SCE_RUSH_CREEK_Geo_Rock_Faults_17i11i_01.mxd

This Page Intentionally Left Blank



SCE Facilities

- Dam
- Powerhouse
- Flowline / Penstock
- FERC Boundary

Other Features

- Other Dam
- City/Town
- Highway
- River/Stream
- Lake
- Watershed Boundary

Fault Zone Data*

Fault Age:

- Historic Displacement (last 200 years)
- Holocene Displacement (last 11,000 years)
- Late Quaternary Displacement (last 750,000 years)
- Undivided Quaternary Displacement (last 1.6 million years)
- Pre-Quaternary Period (more than two million years ago)

*SOURCES: -- USGS, Earthquake Hazards Program, 2018 https://earthquake.usgs.gov/hazards/qfaults
-- California Geological Survey, 2010 https://maps.conservation.ca.gov/cgs/

Seismicity Data**

Magnitude:

- 6-7
- 5-6
- 4-5
- 3-4
- 2-3
- 0.5-2

*SOURCE: -- Northern California Earthquake Data Center (NCEDC), 2021

SOUTHERN CALIFORNIA EDISON®
An EDISON INTERNATIONAL® Company

Rush Creek Project (FERC 1389)

Map 4.7-4

Seismicity and Faults in the Vicinity of the Project

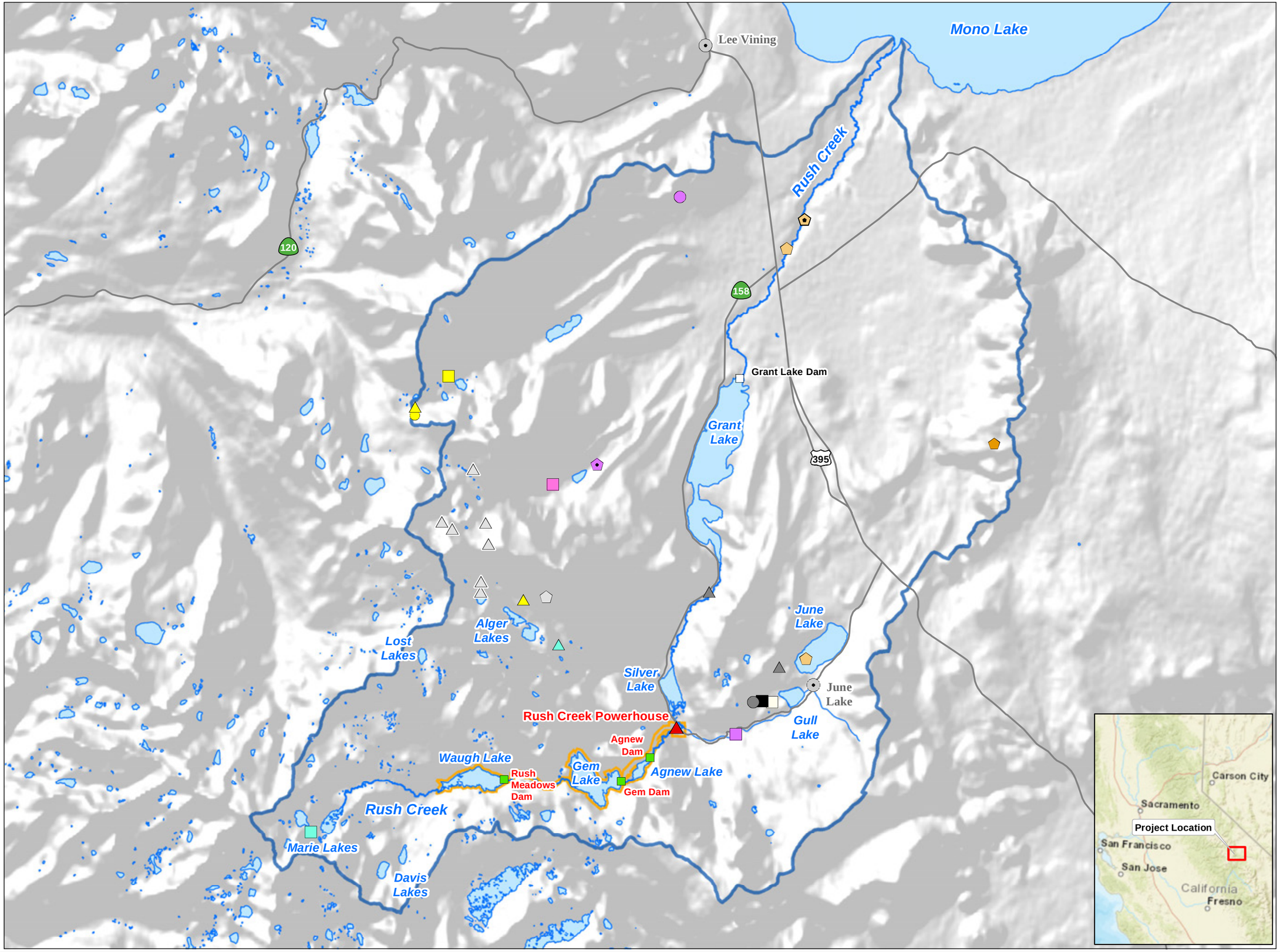
0 0.5 1 2 Miles

Projection: UTM Zone 11
Datum: NAD 83

Date: 7/16/2021

C:\GIS\Cardno\30735240_SCE_EasternHydro\map\Rush Creek\GeoMaps\SCE_RUSH_CREEK_Geo_Seismicity_Faults_17i11i_01.mxd

This Page Intentionally Left Blank



SCE Facilities

- Dam
- Powerhouse
- FERC Boundary

Other Features

- Other Dam
- City/Town
- Highway
- River/Stream
- Lake
- Watershed Boundary

Mining Data*

Material Mined

- Unknown
- Copper
- Gold
- Lead
- Lead, Zinc
- Pumice
- Quartz
- Sand and Gravel, Construction
- Silver
- Tungsten

Mine Status

- Occurrence
- Prospect
- Past Producer
- Unknown
- Producer

*SOURCE: USGS Mineral Resources Data System, 2021

SOUTHERN CALIFORNIA EDISON®
An EDISON INTERNATIONAL® Company

Rush Creek Project (FERC 1389)

Map 4.7-5

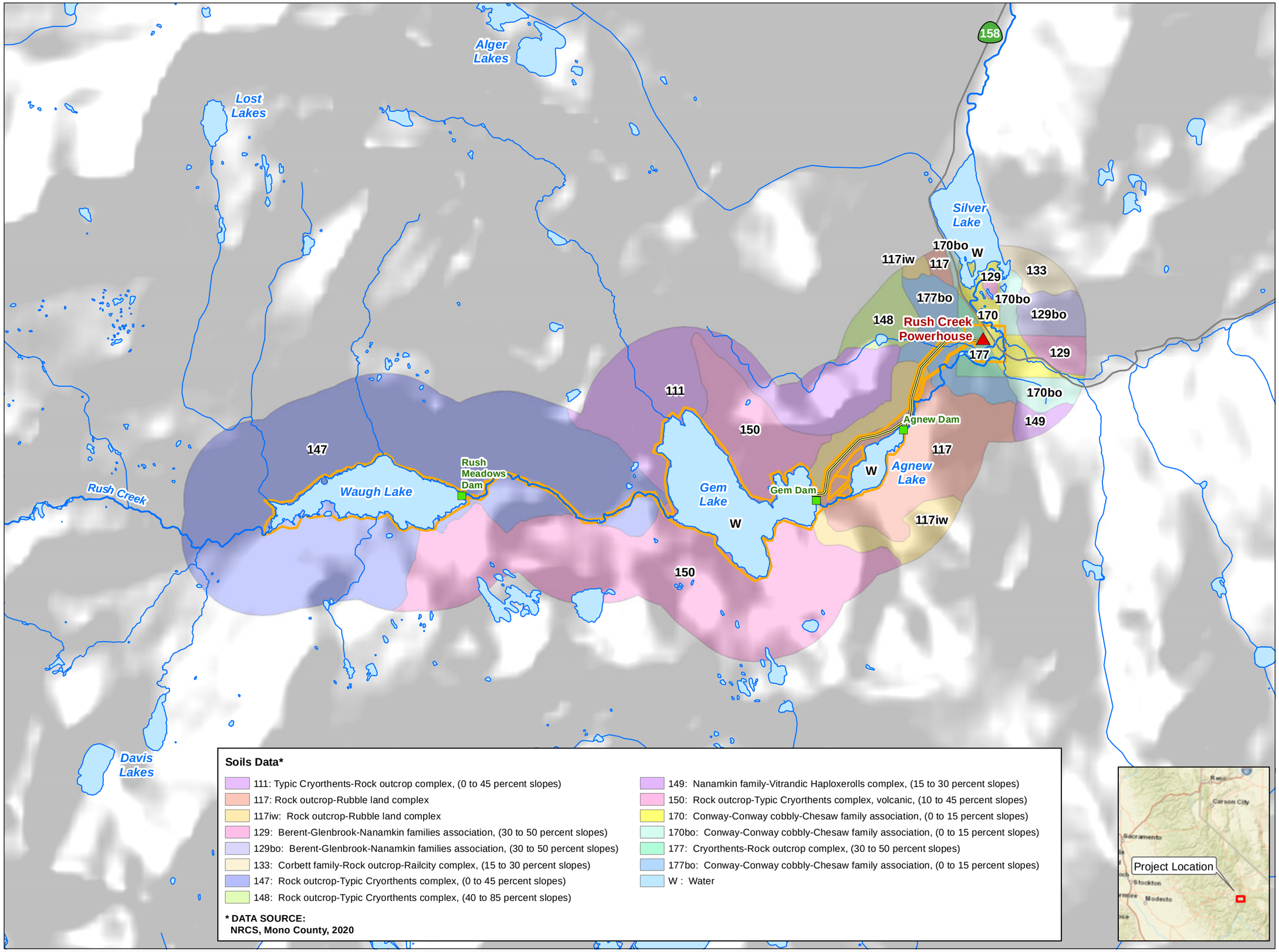
Historic and Current Mining Activity in the Vicinity of the Project

0 0.5 1 Miles

Date: 7/16/2021

Projection: UTM Zone 11
Datum: NAD 83

This Page Intentionally Left Blank



Soils Data*

- 111: Typic Cryorthents-Rock outcrop complex, (0 to 45 percent slopes)
- 117: Rock outcrop-Rubble land complex
- 117iw: Rock outcrop-Rubble land complex
- 129: Berent-Glenbrook-Nanamkin families association, (30 to 50 percent slopes)
- 129bo: Berent-Glenbrook-Nanamkin families association, (30 to 50 percent slopes)
- 133: Corbett family-Rock outcrop-Railcity complex, (15 to 30 percent slopes)
- 147: Rock outcrop-Typic Cryorthents complex, (0 to 45 percent slopes)
- 148: Rock outcrop-Typic Cryorthents complex, (40 to 85 percent slopes)
- 149: Nanamkin family-Vitrandic Haploxerolls complex, (15 to 30 percent slopes)
- 150: Rock outcrop-Typic Cryorthents complex, volcanic, (10 to 45 percent slopes)
- 170: Conway-Conway cobbly-Chesaw family association, (0 to 15 percent slopes)
- 170bo: Conway-Conway cobbly-Chesaw family association, (0 to 15 percent slopes)
- 177: Cryorthents-Rock outcrop complex, (30 to 50 percent slopes)
- 177bo: Conway-Conway cobbly-Chesaw family association, (0 to 15 percent slopes)
- W : Water

*** DATA SOURCE:**
NRCS, Mono County, 2020

SCE Facilities

- Dam
- Powerhouse
- Flowline / Penstock
- FERC Boundary

Other Features

- Highway
- River/Stream
- Lake

SOUTHERN CALIFORNIA EDISON®
An EDISON INTERNATIONAL® Company

Eastern Hydro Generation

Map 4.7-6

Soil Types within 0.5 Mile of the Rush Creek Project Boundary

0 0.25 0.5 Miles

Projection: UTM Zone 11
Datum: NAD 83

Date: 7/16/2021

This Page Intentionally Left Blank

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF MAPS

LIST OF ACRONYMS

Basin	Rush Creek Basin
FERC	Federal Energy Regulatory Commission
FRAP	Fire and Resource Assessment Program
Project	Rush Creek Project
RM	River Mile

4.8 GEOMORPHOLOGY

This section summarizes existing information regarding channel geomorphology and associated fluvial processes in the river reaches (Project-affected reaches) associated with Southern California Edison Company's Rush Creek Project (Project). The Federal Energy Regulatory Commission's (FERC) content requirements for this section are specified in Title 18 of the Code of Federal Regulations Chapter I § 5.6(d)(3)(ii), which includes a requirement to provide a description of streambanks, including steepness, composition, and vegetative cover; and existing erosion, mass soil movement, slumping or other forms of instability.

Channel geomorphology is a description of the channel form (morphology) including dimensions, gradient, planform, and pattern. Fluvial processes refer to the flow, sediment supply, and sediment transport characteristics that create and maintain the channel morphology. Information directly related to channel morphology and sediment transport are not specifically required by the FERC regulations, however, this information is important to understanding channel maintenance processes and the aquatic and riparian habitat in Project-affected reaches.

Descriptions and maps showing the existing geology, topography, and soils in the vicinity of the Project and potential erosion at Project facilities are included in Section 4.7, Geology and Soils. Section 4.9, Wetlands, Riparian, and Littoral Habitats includes a description of the vegetation cover along the streambanks and shorelines.

4.8.1 Information Sources

This section was developed using existing information available in the following primary sources. Additional references are cited in the text, as appropriate.

- Silver Lake Fault Evaluation (AMEC 2011);
- Aerial imagery (Google Earth Pro 2019);
- Channel reach morphology in mountain drainage basins (Montgomery and Buffington 1997);
- United States Geological Survey 1:24,000 Topography Maps and Digital Elevation Models; and
- California Fire Perimeters 1879–2019 Feature Layer (FRAP 2021).

4.8.2 General Geomorphic Setting

The Rush Creek Basin (Basin) is situated within the greater Mono Basin on the eastern slope of the Sierra Nevada (Map 4.2-1). Rush Creek generally flows west to east within the Sierra Nevada range, and begins to flow north, starting at the range front above Silver Lake (Map 4.2-2). The Basin is described in detail in Section 4.2, Rush Creek Basin. Rush Creek can be divided into an upper, higher elevation basin where the Project is located

that is generally upstream of the Reversed Creek confluence, and a lower elevation basin downstream of the Reversed Creek confluence. A general overview of elevation relief, stream gradient, sediment supply, and bank erosion in the Basin is provided below.

4.8.2.1 Elevation Relief

The Basin ranges in elevation from approximately 13,000 feet at the highest points to 6,400 feet at Mono Lake. In the vicinity of the Project, elevations range from 9,392 feet at Waugh Lake, to approximately 7,300 feet at the Rush Creek Powerhouse above Silver Lake (Figure 4.3-4 and Map 4.8-1). Rush Creek hydrology is described in Section 4.3, Water Use and Hydrology.

The geomorphology in the vicinity of the Project consists of the dramatic relief of the eastern Sierra Nevada escarpment as well as glacial landforms occurring as deeply incised U-shaped valleys and alluvial and colluvial deposits emanating from the Basin at the range front (AMEC 2011).

The upper Basin is characterized by steep, deeply incised channels within rugged canyons. These channels have limited geomorphic landform development, and are confined by narrow V-shaped channels and steep-side slopes with a prevalence of bedrock and coarse substrate. Channels with these characteristics are generally not sensitive to changes in flow and sediment regimes.

4.8.2.2 Stream Gradient

The longitudinal profile for Rush Creek is shown in Figure 4.3-4, Project-affected stream reaches are shown in Map 4.8-2, and the slopes for the Project-affected and non-Project stream reaches are shown in Table 4.2-3. The overall gradient of the upper Rush Creek Basin (above the confluence of Reversed Creek) is 8.6% from Waugh Lake (Rush Meadows Dam) to the Rush Creek Powerhouse, with localized reach gradients ranging from 3.5% to 31.8%. In the lower basin (Rush Creek from the Reversed Creek confluence near the Rush Creek Powerhouse downstream to Mono Lake), the gradient ranges from 0.6% to 1.8%.

4.8.2.3 Sediment Supply

Sediment supply sources in the upper Basin are relatively limited. Upstream of the confluence with Reversed Creek, the sediment sources are dominated by colluvium deposits at the base of steep slopes/cliffs (loose, heterogeneous soil/rock fragments deposited by rain wash/continuous downslope creep). Much of the colluvium consists of coarse talus deposits. Because of the bedrock nature of the upper basin, mass wasting along the creek is not evident. Historical construction of Project facilities (dams, tramways, buildings, penstocks, trails) has left some landscape scars, however, because of the bedrock/coarse colluvial nature of the upper Basin, these areas have limited potential to provide sediment supply to the creek. In addition, the reservoirs capture sediment and, therefore, limit sediment supply to the downstream reaches.

In the lower Basin, including the Reversed Creek drainage and Rush Creek downstream of Reversed Creek, more sediment supply is available to the creek (glacial and alluvial sediment). The Reversed Creek drainage, for example, is lower elevation with more developed soil horizons, including remnant materials from glacial activity. The drainage includes developments (housing/commercial), the June Mountain Ski Area, and roads/disturbance that provide anthropogenically derived sediment supply. The Rush Creek valley floor downstream of Reversed Creek consists of glacial till near Silver Lake and a terminal moraine in the vicinity of Grant Lake. Rush Creek passes through these glacial sediments and historical alluvial stream sediments. Some debris flows are also evident on the west side valley floor hillslope below Silver Lake (see Figure 4.8-1).

Fires that could contribute to erosion/sedimentation have been limited in the Basin. The Grant Fire, which burned 395 acres in the hillslope to the east of the Rush Creek below Silver Lake in 2017, is the only recent fire in the areas potentially contributing sediment to the Project-affected reaches (FRAP 2021).

4.8.2.4 Bank Erosion

Generally, the potential for bank erosion is very low. In upper Rush Creek the potential for bank erosion is very low due to the presence of bedrock and coarse boulder substrates that stabilize the streambed and banks. In lower Rush Creek, the potential for excessive bank erosion is also generally low because the streambanks are well-vegetated with riparian trees and shrubs and various grasses. The portion of Rush Creek downstream of Grant Lake historically experienced erosion/incision due to dewatering and loss of riparian vegetation (McBain & Trush 2010).

4.8.3 Channel Reach Geomorphology

A desktop geomorphology assessment using aerial and on the ground imagery was completed for Rush Creek to classify the creek into homogeneous reaches with similar fluvial geomorphic characteristics. The classification was based on Montgomery-Buffington (1997) and designed to help identify the sensitivity of the channels to Project-related changes in sediment supply or hydrology.

The classification delineates channel reaches into process-based categories that: (1) help elucidate the channel spatial linkages; (2) identify potential channel responses to disturbance; and (3) assist with interpretation of historical channel changes. The components of the process-based classification system include (Tables 4.8-1 and 4.8-2):

- Channel Type/Morphology
    - Primary channel type – colluvial, bedrock, cascade, step-pool, plane bed, pool-riffle, or dune-riffle.
    - Channel type diagnostic features - bed material, bedform pattern, roughness elements, sediment sources, sediment storage, confinement, and pool spacing (Table 4.8-1).

- Sediment Transport
    - Whether the channel type is primarily a source of sediment (e.g., hillslope debris flow) or transports sediment.
    - Whether the channel is sediment supply limited or transport limited (Figure 4.8-2).
- Responsiveness
    - Responsiveness of the channel (i.e., channel morphology responds to changes in sediment supply or hydrology).
    - Likely changes to the channel (e.g., width, depth, roughness, scour depth, grain size, slope, sediment storage) if sediment supply or hydrology is modified (Table 4.8-2).
- External Channel Morphology Influences
    - Other factors that affect channel morphology such as valley-wall confinement, bedrock, riparian vegetation, and large woody debris.

The results of the channel geomorphology assessment for each reach are provided in Table 4.8-3 (see Map 4.2-2 for locations).

4.8.4 References

AMEC (AMEC Geomatrix, Inc.). 2011. Silver Lake Fault Evaluation, Mono County, California. June.

FRAP (Fire and Resource Assessment Program). 2021. California Fire Perimeters 1879-2019 Feature Layer. Available at: https://www.arcgis.com/home/item.html?id=6fd0d8d6f47d414da7bcb1dcd0539999

Google Earth Pro. 2019. 7.3.3.7786. Gem Lake, California. 37°46’11.81”, 119°07’43.69” Available at: http://www.google.com/earth/index.html. Accessed September 13, 2019.

McBain and Trush, Inc. 2010. Mono Basin Stream Restoration and Monitoring Program: Synthesis of Instream Flow Recommendations to the State Water Resources Control Board and the Los Angeles Department of Water and Power. Final Report. April 30.

Montgomery, D.R. and J.M. Buffington. 1997. Channel-reach morphology in mountain drainage basins. GSA Bulletin May 1997, v.109, no. 5. pp.

TABLES

This Page Intentionally Left Blank

Table 4.8-1. Physical Characteristics of Montgomery-Buffington (1997) Channel Morphology Types

	Dune Ripple	Pool-Riffle	Plane Bed	Step-Pool	Cascade	Bedrock	Colluvial
Typical bed material	Sand	Gravel	Gravel-cobble	Cobble-boulder	Boulder	Rock	Variable
Bedform pattern	Multilayered	Laterally oscillatory	Featureless	Verically oscillatory	Random	Irregular	Variable
Dominant roughness elements	Sinuosity, bedforms (dunes, ripples, bars) grains, banks	Bedforms (bars, pools), grains, sinuosity, banks	Grains, banks	Bedforms (steps, pools), grains, banks	Grains, banks	Boundaries (bed and banks)	Grains
Dominant sediment sources	Fluvial, bank failure	Fluvial, bank failure	Fluvial, Bank failure, debris flows	Fluvial, hillslope, debris flows	Fluvial, hillslope, debris flows	Fluvial, hillslope, debris flows	Hillslope, debris flows
Sediment storage elements	Overbank, bedforms	Overbank, bedforms	Overbank	Bedforms	Lee and sloss sides of flow obstructions	Pockets	Bed
Typical confinement	Unconfined	Unconfined	Variable	Confined	Confined	Confined	Confined
Typical pool spacing (channel widths)	5 to 7	5 to 7	None	1 to 4	<1	Variable	Unknown

Source: Montgomery and Buffington 1997

Table 4.8-2. Interpreted Reach-level Channel Response Potential to Moderate Changes in Sediment Supply and Discharge Hydrology

	Reach-Level Morphology	Width	Depth	Roughness	Scour Depth	Grain Size	Slope	Sediment Storage
Response	dune-ripple	+	+	+	+	–	+	+
	pool-riffle	+	+	+	+	+	+	+
	plane bed	P	+	P	+	–	+	P
Transport	step-pool	–	P	P	P	P	P	P
	cascade	–	–	P	–	P	–	–
	bedrock	–	–	–	–	–	–	–
Source	colluvial	P	P	–	P	P	–	+

Source: Modified from Montgomery and Buffington 1997

Notes: – = unlikely to change
+ = likely to change
p = possible to change

Table 4.8-3. Geomorphic Assessment for Rush Creek Reaches Based on Montgomery and Buffington (1997)

Stream Reach	Gradient	Channel Type	Sediment Supply Sources	Sediment Transport	Response Type	External Influences	Discussion
Rush Creek Waugh Lake[1]	0.26%	pool-riffle	historical meadow deposits and currently some fine sediment from the presence of the reservoir	transport limited	adjustable, transport limited	currently inundated by Waugh Lake seasonally	Some sediment deposition has occurred in the reservoir footprint since dam construction (1925), but the amount of deposition is very small (Figure 4.8-3). Since 2012 Waugh Lake levels have been maintained at lower levels due to seismic restrictions and some natural revegetation of the reservoir footprint has started. In the future this stream reach may be suitable for restoration if the dam is removed, or water levels are maintained at a low level.
Rush Creek Below Rush Meadow Dam	3.47% (some lower and some steeper sections)	pool-riffle, step-pool	some of the lower gradient sections of stream have streambank sediment storage	mixed – transport limited in the low gradient sections and supply limited in the steeper gradient sections	mixed – adjustable in and lower gradient sections and non-adjustable in the steeper gradient sections	riparian vegetation and large woody debris in the low gradient sections and valley confinement / bedrock in the steeper gradient sections	This stream reach is a mix of low gradient pool-riffle and steep gradient step-pool sections (Figure 4.8-4). The lower gradient stream sections could adjust depending on future operational changes to Project hydrology or changes in sediment supply due to changes in the dam operations (e.g., removal).
Rush Creek Below Gem Dam	29.60%	bedrock, cascade	bedrock, limited sediment availability	supply limited	non-adjustable transport reach	valley confinement / bedrock	Very steep, confined bedrock reach (Figure 4.8-5). No changes in geomorphology anticipated with changes in Project hydrology or sediment supply.
Rush Creek Below Agnew Dam	11.65%	bedrock, cascade	bedrock, limited sediment availability	supply limited	non-adjustable transport reach	bedrock / valley confinement	Steep, confined bedrock reach (Figure 4.8-6). No changes in geomorphology anticipated with changes in Project hydrology or sediment supply.
Rush Creek Horsetail Falls	31.82%	bedrock, cascade	bedrock, limited sediment availability	supply limited	non-adjustable transport reach	bedrock	Very steep bedrock reach (Figure 4.8-7). No changes in geomorphology anticipated with changes in Project hydrology or sediment supply.
Rush Creek Above Silver Lake	1.83%	pool-riffle	streambank sediment storage	transport limited	adjustable depending on the hydrology and sediment regime	riparian vegetation and large woody debris	Lower gradient partially wooded and wetland stream reach flowing into Silver Lake (Figure 4.8-8).
Rush Creek Below Silver Lake	0.59%	pool-riffle	streambank sediment storage	transport limited	adjustable depending on the hydrology and sediment regime	riparian vegetation and large woody debris	Lower gradient stream reach flowing between Silver Lake and Grant Lake (Figure 4.8-1).
Rush Creek Below Grant Lake	1.44%	pool-riffle	streambank sediment storage	transport limited	adjustable depending on the hydrology and sediment regime	riparian vegetation and historic incision	This reach was historically dewatered, and incision and loss of riparian vegetation occurred. Currently, the channel Los Angeles Department of Water and Power (LADWP) provides flows in the reach and the channel is in a state of recovery.
South Rush Creek	13.62%	bedrock, cascade, pool-riffle	bedrock, limited sediment availability except in the lower portion of the reach near the Rush Creek Powerhouse where there is streambank storage of sediment	mixed – supply limited in the steeper gradient section and transport limited in the low gradient section near the Rush Creek Powerhouse	mostly non-adjustable transport reach except in the low gradient section near the Rush Creek Powerhouse, which is adjustable	bedrock in most of the reach, but riparian vegetation and large woody debris in the section near the Rush Creek Powerhouse	This is mostly a steep, bedrock stream that splits off of Rush Creek and rejoins Reversed Creek / Rush Creek near the Rush Creek Powerhouse (Figure 4.8-8). The low gradient section is in places filled / clogged with large woody debris (Figure 4.8-9).

Notes:

[1] This river reach is seasonally inundated by Waugh Lake.

This Page Intentionally Left Blank

FIGURES

This Page Intentionally Left Blank

Figure 4.8-1. Google Earth aerial imagery of debris flow near Rush Creek below Silver Lake (facing downstream) near River Mile [RM] 15.7 to RM 15.1

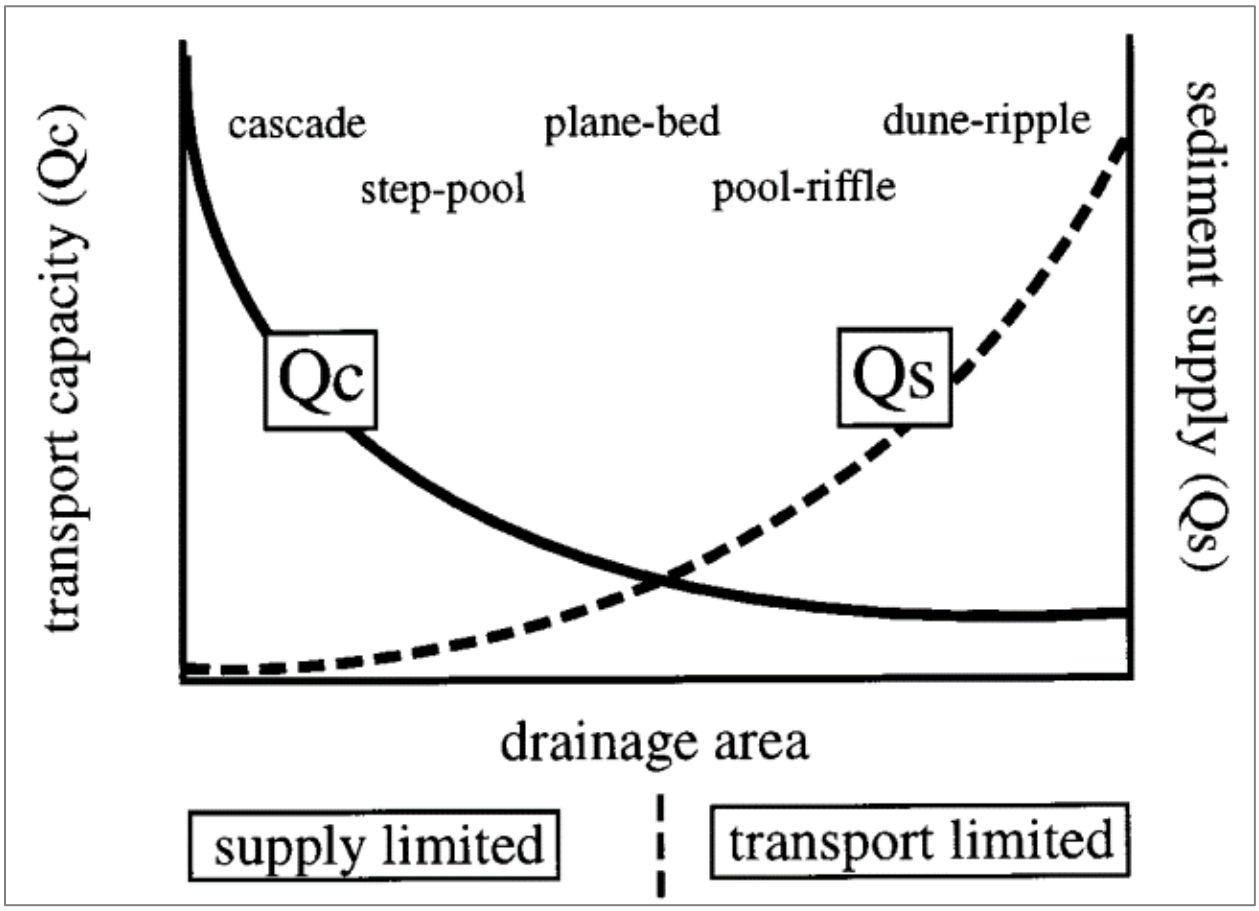


Figure 4.8-2. Schematic illustration of generalized relative trends in sediment supply (Qs) and transport capacity (Qc) in mountain drainage basins (Montgomery and Buffington 1997).

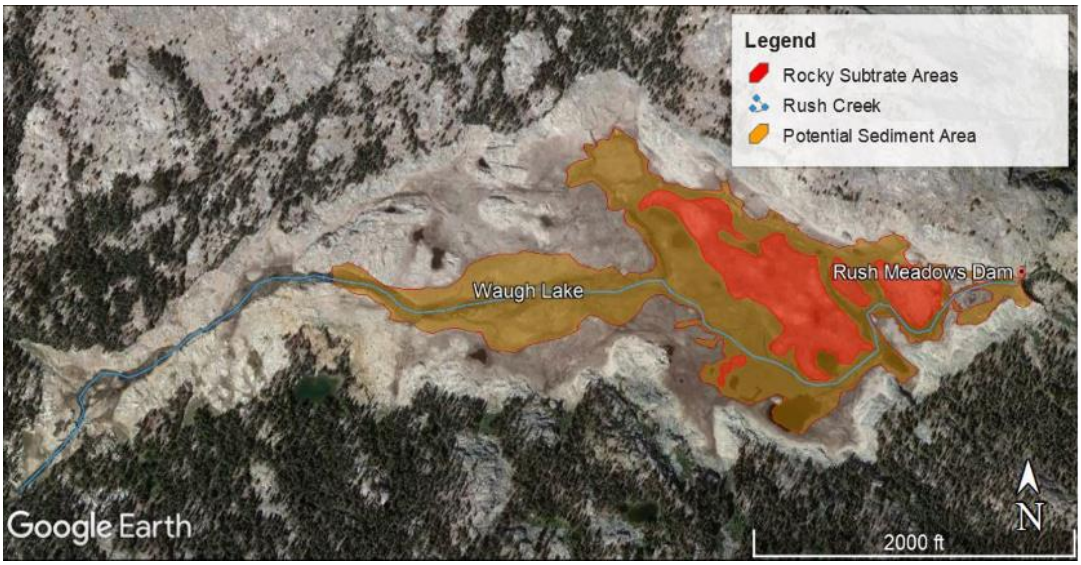


Figure 4.8-3. Rush Creek in Waugh Lake (when drawn down) showing limited historical sediment deposition since impoundment in 1925.

Figure 4.8-4. Lower gradient and a steeper gradient, confined section of Rush Creek below Rush Meadows Dam (top) and low gradient section of Rush Creek below Rush Meadows Dam (bottom).

Figure 4.8-5. Rush Creek below Gem Dam and above Agnew Lake.

Figure 4.8-6. Rush Creek below Agnew Dam.

Figure 4.8-7. Rush Creek Horsetail Falls reach including the South Rush Creek distributary.

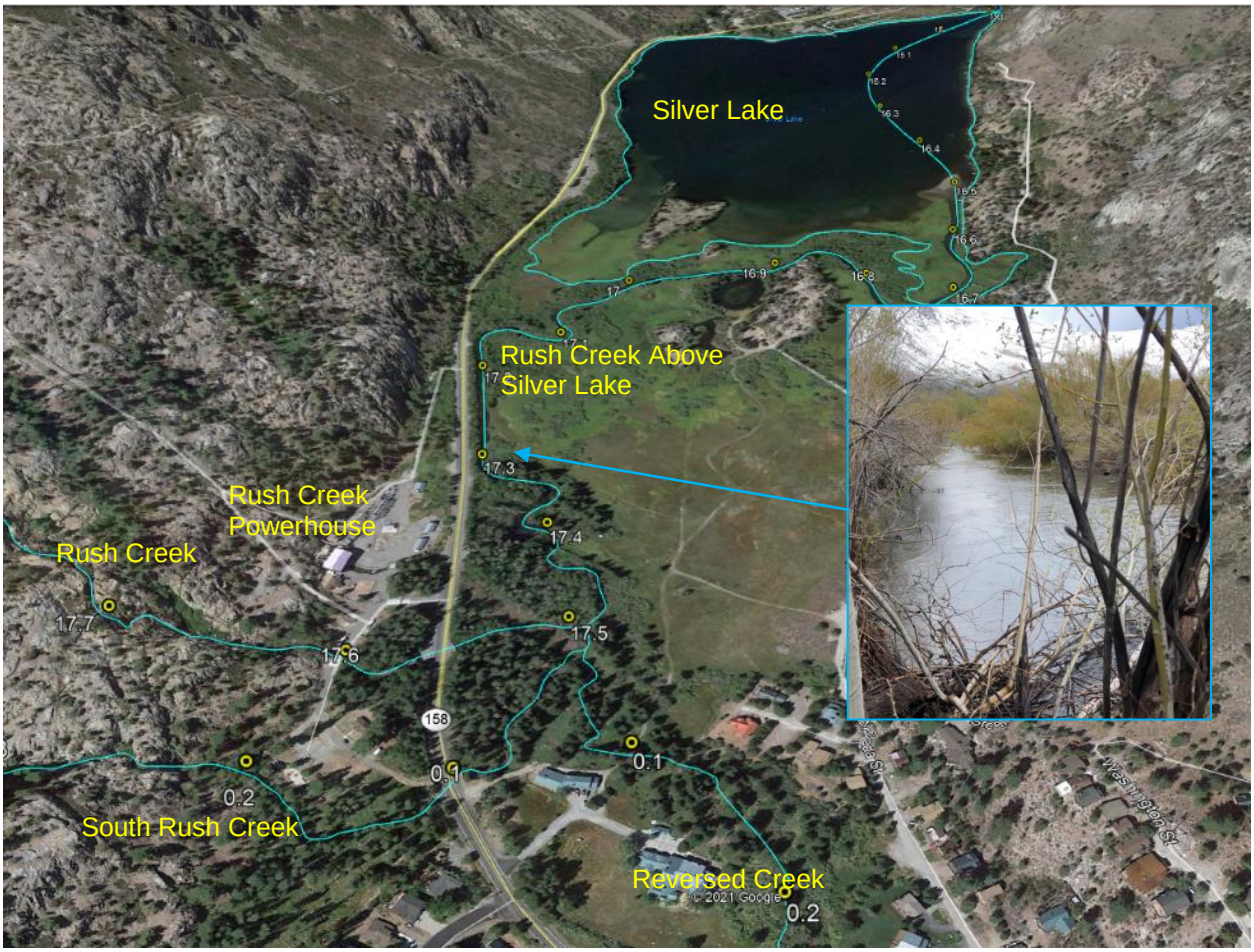


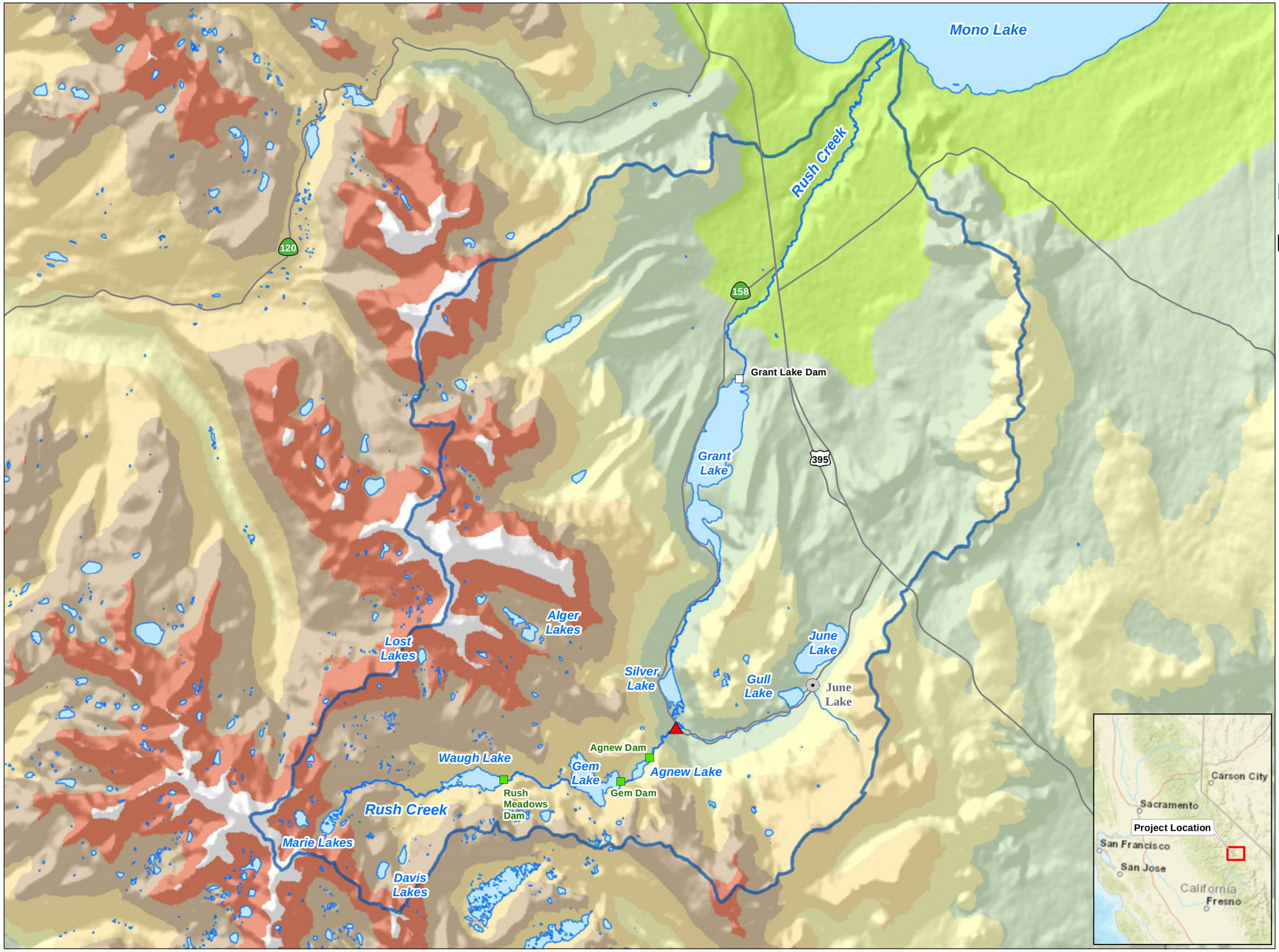
Figure 4.8-8. Rush Creek above Silver Lake including South Rush Creek and Reversed Creek.

Figure 4.8-9. Low gradient portion of South Rush Creek upstream of the highway (top) and downstream of the highway (bottom).

This Page Intentionally Left Blank

MAPS

This Page Intentionally Left Blank



SCE Facilities

- Dam
- Powerhouse

Other Features

- Other Dam
- City/Town
- Highway
- River/Stream
- Lake
- Rush Creek Watershed

Elevations

- 6000'-7000'
- 7000'-8000'
- 8000'-9000'
- 9000'-10,000'
- 10,000'-11,000'
- 11,000'-12,000'
- 12,000'-13,000'

SOUTHERN CALIFORNIA EDISON
An EDISON INTERNATIONAL Company

Rush Creek Project (FERC 1389)

Map 4.8-1

Topography in the Rush Creek Watershed

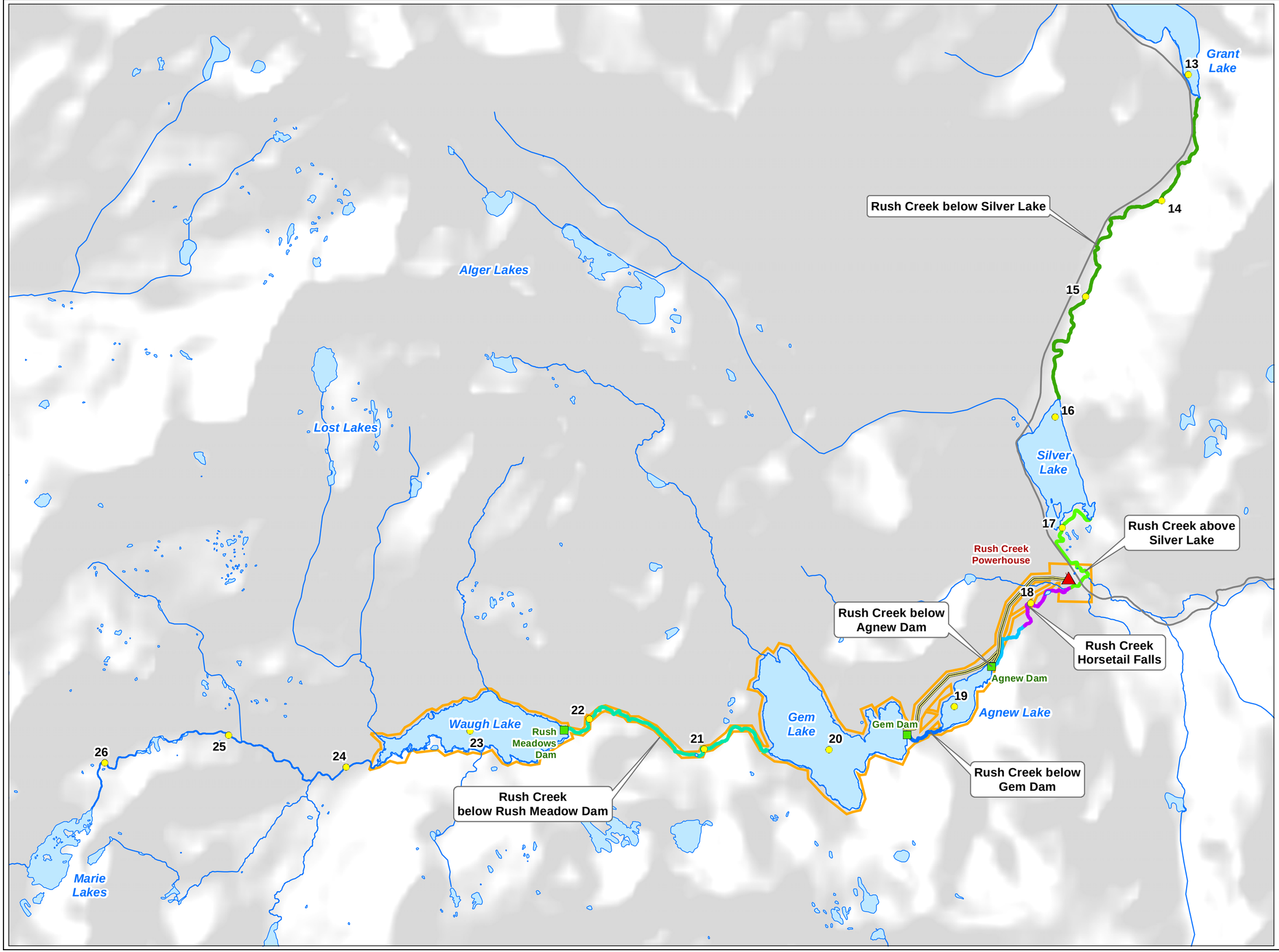
0 0.5 1 Miles

Projection: UTM Zone 11
Datum: NAD 83

Date: 6/24/2021

C:\GIS\Cardno\30735240_SCE_EasternHydro\map\Rush Creek\GeoMaps\SCE_RUSH_CREEK_Topo_17i11i_01.mxd

This Page Intentionally Left Blank



SCE Facilities

- Dam
- Powerhouse
- Flowline / Penstock
- FERC Boundary

Other Features

- Highway
- River/Stream
- Lake
- River Mile

Project-affected Reaches

- Rush Creek below Rush Meadow Dam
- Rush Creek below Gem Dam
- Rush Creek below Agnew Dam
- Rush Creek Horsetail Falls
- Rush Creek above Silver Lake
- Rush Creek below Silver Lake

SOUTHERN CALIFORNIA EDISON
An EDISON INTERNATIONAL Company

Rush Creek Project (FERC 1389)

Map 4.8-2

Rush Creek
Project-affected Reaches

0 0.25 0.5 Miles

Projection: UTM Zone 11
Datum: NAD 83

Date: 4/30/2021

C:\GIS\Cardno\30735240_SCE_EasternHydro\map\Rush Creek\GeoMaps\SCE_RUSH_CREEK_ProjAffReaches_17i11i_01.mxd

This Page Intentionally Left Blank

TABLE OF CONTENTS

LIST OF TABLES

LIST OF MAPS

LIST OF ACRONYMS

CALVEG	Classification and Assessment with LANDSAT of Visible Ecological Groupings
DSOD	Division of Safety of Dams
FERC	Federal Energy Regulatory Commission
Forest Service	United States Forest Service
GIS	Geographic Information Systems
LANDSAT	land satellite
NWI	National Wetlands Inventory
Project	Rush Creek Project
RM	River Mile
SCE	Southern California Edison Company
USFWS	United States Fish and Wildlife Service

4.9 WETLAND, RIPARIAN, AND LITTORAL HABITATS

This section describes floodplains along Project-affected stream reaches, and littoral zones associated with Project reservoirs and Silver Lake (a natural lake) in the vicinity of Southern California Edison Company's (SCE) Rush Creek Project (Project). The section also describes wetland and riparian habitats associated with the floodplains and littoral zones. The content requirements for this section are specified in Title 18 of the Code of Federal Regulations Chapter I § 5.6(d)(3)(vi). The Federal Energy Regulatory Commission (FERC) regulations require a description of the floodplain, wetlands, riparian, and littoral habitats in the vicinity of the Project, which must include: (1) a list of plant and animal species, including invasive species, that use the wetland, littoral, and riparian habitat; (2) a map showing these habitats; and (3) estimates of acreage for each type of wetland, riparian, or littoral habitat, including variability in such availability as a function of storage at a project that is not operated in run-of-river mode. This section also describes vegetation cover along the streambanks and reservoir shorelines, specified in § 5.6(d)(3)(ii)(C).

A floodplain is a relatively flat lowland adjacent to a river, underlain by unconsolidated alluvial deposits, and subject to periodic inundation by the river. The littoral zone occurs in the near-shore areas of lakes/reservoirs where sunlight penetrates to the bottom of the waterbodies such that aquatic plants are able to grow. (Note that, in this section, discussion of the littoral zone associated with Project reservoirs and Silver Lake is broadened to include wetland and riparian habitats that occur on the margins of/upslope of the inundated areas of the reservoir/lake).

Wetland and riparian habitats may occur within the floodplain alongside a stream or within the littoral zone of a reservoir/lake. Hydrologic conditions (including water table elevations, the annual hydrograph, and overbanking flows/reservoir fluctuations) and soil types present define the location wetland and riparian habitats within the floodplains/littoral zones. Wetlands are areas that are inundated or saturated by surface or groundwater at a sufficient frequency and duration to support vegetation that is adapted to these hydrologic and saturated soil conditions. Meadows are a type of wetland found in moist areas that are typically seasonally or temporarily flooded. Riparian habitat is located in transitional areas between the aquatic and terrestrial landscapes regularly influenced by fresh water, and normally extend from the edges of waterbodies (e.g., streams, rivers, and lakes) to the edges of the upland communities.

The study area in this section is defined to include the full extent of wetland and riparian habitats associated with the floodplains along Project-affected reaches and the littoral zones associated with Project reservoirs and Silver Lake. Refer to Table 4.9-1 for a list of Project-affected stream reaches, reservoirs, and Silver Lake. Wetland and riparian habitats associated with drainages that feed into Project-affected reaches, Project reservoirs, and Silver Lake are also identified.

4.9.1 Information Sources

Existing information on floodplains, littoral zones, and associated wetland and riparian habitats in the study area includes published reports associated with previous studies, geographic information system (GIS) data, aerial imagery, and management plans and policies that describe desired conditions for riparian systems. Documents and studies that were reviewed in the development of this section include:

- Classification of Wetlands and Deepwater Habitats of the United States (Cowardin et al. 1979);
- Environmental Assessment for Hydropower License, Rush Creek, FERC Project No. 1389-001, California (FERC 1992);
- Baseline Riparian Monitoring of Lee Vining and Rush Creeks, Year 1 (1999) Annual Report (Psomas 2000);
- Rush and Lee Vining Creeks Riparian Monitoring Baseline Summary (Psomas 2004);
- Biological Resources Evaluation Technical Report for the Southern California Edison South Lake Dam, Agnew Lake Dam, Saddlebag Lake Dam, and Tioga Lake Dam, and Auxiliary Dam Maintenance and Geo-membrane Lining Projects (Psomas 2010);
- Analysis of Riparian Vegetation Phase 2 (Year 1) and Comparison to Baseline (Read 2010);
- Vegetation Transect Survey Memorandum for California Department of Fish and Wildlife Temporary Variance of License Article 401 Curtailing Water Level Requirements for Gem and Waugh Lakes for Seismic Concerns, SCE Rush Creek Hydroelectric Project (Psomas 2017);
- Rush Creek Emergency Project (FERC No. 1389) Pre-release Survey and Assessment Report (SCE 2017a);
- Rush Creek (Phase II) Project (FERC No. 1389) Pre-construction Biological Survey and Assessment Report Rush Meadows Dam Project Area (SCE 2017b); and
- Analysis of Riparian Vegetation and Aquatic Habitat: 2018 Field Season and Comparison to Previous Years (Read and Salamunovich 2019).

The following sources were used to develop maps and to quantify the acres of wetland and riparian habitats within floodplains along Project-affected stream reaches and the littoral zones associated with Project reservoirs and Silver Lake:

- The Classification and Assessment with land satellite (LANDSAT) imagery of Visible Ecological Groupings (CALVEG) (United States Forest Service [Forest Service] 2018).

- The United States Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI)[1] (USFWS 2021).

- Data layers developed as part of surveys conducted in 2017 (SCE 2017a, 2017b).

4.9.2 Floodplains

This section provides a description of the floodplains along Project-affected stream reaches associated with Rush Creek and South Rush Creek, including a description of wetland and riparian habitats within the floodplains and along adjacent drainages.

Maps 4.9-1a through 4.9-1f display existing information on the spatial extent of wetland and riparian habitats in the vicinity of the Project. These maps are based primarily on CALVEG and NWI GIS layers, with additional GIS layers from SCE (2017a and 2017b) which provide additional detail on wetland/riparian habitat along portions of Rush Creek below Rush Meadows Dam and below Agnew Dam. Note that the CALVEG and NWI GIS layers are based primarily on aerial imagery and often do not capture small-scale wetland/riparian habitats and/or riparian/wetland habitats that are obscured by overhead vegetation.

Table 4.9-2 provides a description of CALVEG and NWI wetland and riparian habitat types occurring in vicinity of the Project, grouped according to classification system (e.g., CALVEG, NWI). Table 4.9-3 quantifies the extent of wetland and riparian habitats in the vicinity of the Project based on available information shown in Maps 4.9-1a through 4.9-1f. The following provides a description of each Project-affected stream reach.

4.9.2.1 Rush Creek

Rush Creek Below Rush Meadows Dam

The Rush Creek below Rush Meadows Dam Reach includes both lower-gradient and steeper-gradient sections. The lower-gradient sections are less confined and support a broader floodplain (relative to the downstream sections). The steeper-gradient sections are confined within bedrock and have a very narrow floodplain.

[1] This is the official USFWS wetland classification system and the Federal standard for wetland classification. See 61 Federal Register 39465. Wetlands are classified by trained analysts at the USFWS that identify and classify wetland habitat from aerial imagery. Riparian and wetland mapping within the vicinity of the Project was based on 1985 imagery.

CALVEG and NWI do not identify any wetland or riparian habitat along this reach, likely because riparian habitat occurs as an understory of the pine-dominated forest (refer to the results of long-term monitoring, below). One 1.45-acre freshwater wetland was identified (USFWS 2021) adjacent to the floodplain. This wetland appears to be associated with a drainage that feeds into Rush Creek from the north near river mile (RM) 20.7.

Additional information on wetland/riparian habitat associated with the floodplain of Rush Creek below Rush Meadows Dam was obtained from the following studies:

- Long-term riparian monitoring was conducted at three monitoring sites along this reach, as required under Forest Service 4(e) Condition No. 7 of the FERC license for the Rush Creek Project (FERC 1997). The monitoring was conducted in 1999, 2000, 2001 (Psomas 2000, 2004), 2009 (Read 2010), and 2018 (Read and Salamunovich 2019). The three monitoring sites are shown on Map 4.9-2. Abiotic and vegetation attributes were monitored at two of the sites according to parameters specified in Forest Service 4(e) Condition No. 7 (FERC 1997). The third site was a photo point monitoring location only.

- SCE mapped vegetation communities along Rush Creek below Rush Meadows Dam in advance of lowering water levels and initiating spillway modifications (SCE 2017a, 2017b).

Based on the results of the long-term monitoring, woody riparian vegetation populates the entire floodplain in the vicinity of the three monitoring sites. Willow species, which were the only riparian shrub species present in sufficient abundance for sampling, were used as an indicator of the presence of riparian habitat for these studies (Psomas 2000). The dominant riparian shrub was Sierra willow (*Salix orestra*), with lesser amounts of mountain willow (*S. eastwoodiae*) and tea-leaved willow (*S. planifolia*). Riparian vegetation at the monitoring sites occurred as an understory of a lodgepole pine (*Pinus contorta* ssp. *murrayana*) forest and thus habitat along the reach was described as a “mixed lodgepole pine–willow riparian community” (Psomas 2000). The width of the riparian corridor from the streambank ranged between 13 and 97 feet, with an average width of 51 feet within the monitoring area (Psomas 2000). Canopy cover of the overstory forest increased from baseline (1999) through 2018, while cover by riparian and upland herbaceous species declined.

As stated previously, SCE mapped vegetation communities along Rush Creek to approximately 600 feet below Rush Meadows Dam (upstream of the three long-term monitoring sites) (SCE 2017b). Approximately 3.96 acres of one riparian habitat type, mixed willow riparian forest (as classified by Holland 1986), was mapped (refer to Map 4.9-1a). Mountain willow was identified as the dominant species in this portion of the reach.

Rush Creek Below Gem Dam

The Rush Creek below Gem Dam Reach is a steep mountain stream which is confined in bedrock and with a very narrow floodplain. Riparian vegetation along this reach is distributed discontinuously in patches along the stream; rocky granitic sections lack riparian vegetation (refer to Map 4.9-1d). CALVEG identifies 3.96 acres of willow (shrub) habitat along this reach.

Rush Creek Below Agnew Dam

The Rush Creek below Agnew Dam Reach is a steep mountain stream which is confined in bedrock with a very narrow floodplain. CALVEG and NWI data do not indicate the presence of wetland/riparian habitats along this reach. In 2017, SCE mapped vegetation communities along Rush Creek from Agnew Dam downstream approximately 1,500 feet (SCE 2017a). Based on this information, approximately 2.80 acres of riparian habitat is present immediately below the dam and discontinuously distributed along the remaining portion of the reach. This habitat is characterized as mixed willow riparian habitat, dominated by mountain willow and dogwood (*Cornus* sp.) (refer to Map 4.9-1d).

Rush Creek Horsetail Falls

The Rush Creek Horsetail Falls Reach is a very high-gradient stream dominated by a waterfall with a very narrow floodplain. CALVEG and NWI identified approximately 0.66 acre of quaking aspen habitat distributed along drainages entering this reach (refer to Map 4.9-1d).

Rush Creek Above Silver Lake

The Rush Creek above Silver Lake Reach is a low-gradient meadow stream. The stream and associated floodplain are mostly confined within bedrock from just below RM 17.7 to RM 17.5, at which point it meanders through a relatively wide floodplain to its confluence with Silver Lake (refer to Map 4.9-1e). NWI identifies approximately 23.19 acres of freshwater emergent wetland and 37.20 acres of freshwater forested/shrub wetlands occurring along the banks of the creek (USFWS 2021). CALVEG data indicate that there are approximately 33.55 acres of wet meadow habitat and 26.05 acres of willow-dominated riparian habitat within the broader floodplain along this reach.[2]

Rush Creek Below Silver Lake

The Rush Creek below Silver Lake Reach is a low-gradient stream that gently meanders for approximately 2.7 miles to its confluence with Grant Lake (refer to Map 4.9-1f). CALVEG identifies 37.10 acres of quaking aspen and 6.38 acres of willow (shrub) habitat

[2] Rush Creek above Silver Lake and Silver Lake itself are contained within one broad floodplain, with several additional inputs (e.g., Reversed Creek). For the purpose of quantification, we attributed all wetland/riparian habitats occurring upstream of the southern shoreline of Silver Lake to Rush Creek. All wetland/riparian habitats occurring downstream of the southern shoreline of Silver Lake are attributed to Silver Lake.

adjacent to the reach. NWI identifies 25.21 acres of freshwater forested/shrub wetland along this reach.

4.9.2.2 South Rush Creek

South Rush Creek

South Rush Creek diverges from Rush Creek near RM 17.8 and converges with it again at near RM 17.5. South Rush Creek is mostly a steep, bedrock stream with a very narrow floodplain; however, the downstream-most portion of the creek is lower-gradient with a broader floodplain. CALVEG identifies approximately 0.49 acre of forested/shrub wetland habitat along the downstream portion of the reach; NWI does not indicate the presence of wetland/riparian habitat along any portion of the reach.

4.9.3 Littoral Zones

This section provides a discussion of littoral zones associated with Project reservoirs and Silver Lake, including a description of wetland and riparian habitats that occur on the margins of/upslope of the inundated areas of the reservoir/lake. This section also describes wetland and riparian habitats occurring along drainages feeding into Project reservoirs and Silver Lake.

Refer to Maps 4.9-1a through 4.9-1f for existing information on the spatial extent of these wetland and riparian habitats. As described previously, these maps are based primarily on CALVEG and NWI GIS layers, with additional GIS layers from SCE (2017a, 2017b) which provided more detail on wetland/riparian habitat along the shoreline of Waugh Lake and Agnew Lake. Table 4.9-2 provides a description of CALVEG and NWI wetland and riparian habitat types associated with Project reservoirs and Silver Lake, grouped according to classification system. Table 4.9-3 quantifies the extent of wetland and riparian habitats associated with Project reservoirs and Silver Lake as shown in Maps 4.9-1a through 4.9-1f.

4.9.3.1 Waugh Lake

Waugh Lake is a man-made reservoir impounded by Rush Meadows Dam. Beginning in 2012, in consultation with FERC and Division of Safety of Dams (DSOD), SCE reduced reservoir storage in response to seismic concerns associated with the dam. Waugh Lake maximum operating elevation was 9,416 feet prior to 2012. Since 2012, the maximum operating elevation is 9,392 feet. Prior to 2012, the reservoir had a shoreline length of 4.57 miles and a water surface area of 185 acres. Currently, under the seismic restriction limitation, Waugh Lake has shoreline length of 4.40 miles and a water surface area of 130 acres.

CALVEG does not provide any data regarding wetland/riparian habitats within the littoral zone associated with Waugh Lake (as described previously, CALVEG maps are based on aerial imagery and typically do not capture smaller-scale habitat patches). NWI maps indicate that freshwater emergent wetland habitat and/or freshwater forested/shrub

habitat is present along three unnamed drainages that feed into the lake, one from the north and two from the south (refer to Map 4.9-1a).

SCE collected baseline data on nine transects established along the shoreline of Waugh Lake in 2012 (Map 4.9-2), and then revisited the transects in 2013, 2014, 2015, 2016, and 2017 to assess changes in littoral zone vegetation resulting from lowered water levels (Psomas 2017). The results of these studies comprise the primary source of information about wetland/riparian habitat associated with Waugh Lake.

As described by Psomas (2017), prior to dewatering, the littoral community within/adjacent to the ordinary high water mark of Waugh Lake was characterized by barren rock, sand, silt, and woody debris. Since dewatering, the newly exposed shoreline has been partially colonized by herbaceous species, with high species richness and no dominant species (Psomas 2017). Rushes (*Juncaceae*), sedges (*Cyperaceae*), and grasses (*Poaceae*) colonized in high numbers compared to surrounding habitats (Psomas 2017). Willows and lodgepole pines are gradually colonizing these areas, but none are large enough to be in the canopy layer.

Riparian habitats along Waugh Lake are patchily distributed and confined to drainages or shallow bowls along the historic shoreline, characterized in the Psomas report (2017) as aspen riparian forest and mixed willow riparian forest. Each of these habitat types are described below:

- The aspen riparian forest adjacent to Waugh Lake is dominated by quaking aspen with an understory of willows, grasses, and annuals. There are also intermittent limber pine (*Pinus flexilis*), lodgepole pine, and mountain hemlock (*Tsuga mertensiana*) in the canopy. The understory was abundant in most areas and included rushes (*Juncus balticus*, *Juncus* spp.), bulrush (*Scirpus* spp.), sedges (*Carex* spp.), willow herb (*Epilobium angustifolium*), meadow rue (*Thalictrum fendleri*), western mugwort (*Artemisia ludoviciana*), angelica (*Angelica lineariloba*), currants (*Ribes* spp.), mountain phacelia (*Phacelia hastata* var. *hastata*), buckwheats (*Eriogonum* spp.), dogbane (*Apocynum androsaemifolium*), mountain monardella (*Monardella odoratissima*), thistle (*Circium andersonii*), grasses (*Elymus elymoides*, *Deschampsia elongata*, *Poa* spp., *Agrostis* spp., among others), beaked penstemon (*Penstemon rostriflorus*), alpine pussy toes (*Antennaria media*),and Sierra penstemon (*Penstemon heterodoxus*), among others.

- The mixed willow riparian forest is dominated by willows (*Salix lutea*, *S. lemmonii*, *S. geyeriana*, *S. drummoidiana*, and/or *S. arctica*), with intermittent lodgepole pine, quaking aspen, mountain hemlock, and limber pine. The understory was sparse in most areas due to the density of the willows; however, in the openings, rushes, bulrush, sedges, willow herb, meadow rue, western mugwort, angelica, currants, mountain phacelia, buckwheats, dogbane, mountain monardella, thistle, grasses, beaked penstemon, alpine pussy toes, and Sierra penstemon, among others, were observed.

4.9.3.2 Gem Lake

Gem Lake is a man-made reservoir impounded by Gem Dam. Beginning in 2012, in consultation with FERC and DSOD, SCE also reduced reservoir storage in response to seismic concerns associated with the dam. Gem Lake maximum operating elevation was 9,052 feet prior to 2012. Since 2012, the maximum operating elevation is 9,027.5 feet. Prior to 2012, Gem Lake had a shoreline length of 4.53 miles and a water surface area of 282 acres. Currently, under the seismic restriction limitation, the shoreline length is 4.63 miles (with the increase resulting from a less uniform shoreline and the appearance of islands) and a water surface area of 256 acres.

As shown on Map 4.9-2, SCE collected baseline data on six transects established along the shoreline of Gem Lake in 2012. These transects were revisited in 2013, 2014, 2015, 2016, and 2017 to assess any changes in the riparian and littoral communities in response to lowered lake levels. The results of these studies comprise the primary source of information about wetland/riparian habitat associated with Gem Lake. CALVEG documents only one stand of quaking aspen riparian habitat (approximately 5.05 acres) associated with two small drainages entering the southernmost shore of Gem Lake. NWI maps indicates that freshwater emergent wetland and freshwater forested/shrub wetland is present along these drainages (refer to Map 4.9-1c).

Similar to Waugh Lake, dewatering of Gem Lake has resulted in a transition in the littoral habitats from barren shoreline to communities dominated by sedges, rushes, and grasses (Psomas 2017). Stands of aspen riparian forest and mixed willow riparian forest adjacent to the reservoir are found primarily along drainages entering the reservoir. These habitats are the same as those described for Waugh Lake; however, mountain hemlock was absent from the riparian habitats at Gem Lake.

4.9.3.3 Agnew Lake

Agnew Lake is a natural lake that was impounded (by Agnew Dam) to provided additional storage for hydro generation and facilitate transport of equipment and personnel across the reservoir by barge. As described previously for Waugh and Gem lakes, beginning in 2012, in consultation with FERC and DSOD, SCE also reduced reservoir storage in Agnew Lake in response to seismic concerns associated with the dam. Agnew Lake maximum operating elevation was 8,496 feet prior to 2012. Currently, under the seismic restriction, the dam does not impound water and the maximum elevation of the remaining natural lake is 8,470 feet. Prior to 2012, Agnew Lake had a shoreline length of 1.39 miles and a water surface area of 40 acres. Under the seismic restrictions, Agnew Lake is again a natural lake (no usable storage) with a shoreline length of 1.24 miles, and a water surface area of 23 acres.

Agnew Lake contains discontinuous patches of riparian vegetation along the shoreline, most of which are associated with shallow basins or drainages that flow into the lake (Map 4.9-1d). Adjacent to the shoreline, CALVEG identifies 33.83 acres of willow (shrub) habitat, and NWI identifies freshwater emergent wetland occurring along a drainage entering the south side of the reservoir, near the inflow of Rush Creek. SCE mapped

vegetation communities along the portion of Agnew Lake within approximately 600 feet of the dam (SCE 2017a). Approximately 0.41 acre of mixed willow riparian forest was mapped along the northwestern shore of the reservoir (refer to Map 4.9-1d).

4.9.3.4 Silver Lake

Silver Lake is a natural lake set in a relatively shallow basin approximately 1 river mile below Rush Creek Powerhouse which receives water from Rush Creek, Reversed Creek, Alger Creek, and other smaller local drainages. CALVEG indicates that there are approximately 5.27 acres of quaking aspen habitat occurring along the shoreline.[3] During periods of high runoff (i.e., 2017), the entire wetland south of the lake to State Route 158 can become inundated.

4.9.4 Plant and Wildlife Species that Use Wetland and Riparian Habitats

Wetland and riparian habitats within the floodplains and littoral zones of the Project-affected stream reaches, Project reservoirs, and Silver Lake (as well as along tributary drainages) provide habitat for a variety of special-status plant and wildlife species, and invasive plants. Riparian corridors provide valuable habitat for riparian nesting birds and provide covered travel corridors for a multitude of wildlife species. Refer to Table 4.9-3 for a list of special-status plants, special-status wildlife species, and invasive plants that are known to occur or may potentially utilize wetland and riparian habitats. Fish and other aquatic species that use or are influenced by wetland and riparian habitats are described in Section 4.5, Fish and Aquatic Resources.

4.9.5 References

Cowardin, L.M., V. Cater, F.C. Golet, and E.T. LaRoe. 1979 Classification of Wetlands and Deepwater Habitats of the United States. Reprinted in 1991. FWS/OBS-17/31. Performed for the U.S. Department of Interior, Fish and Wildlife Service, Office of Biological Service. 132 pp.

FERC (Federal Energy Regulatory Commission). 1992. Environmental Assessment for Hydropower License. Rush Creek (FERC Project No. 1389-001), California. May.

———. 1997. Order Issuing New License, Rush Creek Project. FERC Accession No. 19970210-0301. 78 FERC ¶ 61,109. February.

Forest Service (United States Forest Service). 2018. Pacific Southwest Region. Vegetation Classification and Mapping. CALVEG. Available at https://www.fs.usda.gov/detail/r5/landmanagement/resourcemanagement/?cid=stelprdb5347192

Holland, R.F. 1986. Preliminary Description of the Terrestrial Natural Communities of California. State of California, the Resources Agency, Nongame Heritage Program, California Department of Fish and Game, Sacramento, California. October 1986.

Psomas. 2000. Baseline Riparian Monitoring of Lee Vining and Rush Creeks, Year 1 (1999), Annual Report. Prepared for Southern California Edison, Hydro Generation Division. Draft February 2, 2000.

———. 2004. Rush and Lee Vining Creek Riparian Monitoring Baseline Summary (Draft). Prepared for Southern California Edison, Hydro Generation Division. May 2004.

———. 2010. Biological Resources Evaluation Technical Report for the Southern California Edison South Lake Dam, Agnew Lake Dam, Saddlebag Lake Dam, and Tioga Lake Dem, and Auxiliary Dam Maintenance and Geo-Membrane Lining Projects. Prepared for Southern California Edison, Eastern Hydro Division. November 2010.

———. 2017. Vegetation Transect Survey Memorandum for California Department of Fish and Wildlife Temporary Variance of License Article 401 Curtailing Water Level Requirements for Gem and Waugh Lakes for Seismic Concerns, Southern California Edison Rush Creek Hydroelectric Project (FERC Project No. 1389). November 21, 2017.

Read, E. 2010. Analysis Riparian Vegetation Phase 2 (Year 1) and Comparison to Baseline, Rush Creek Project (FERC Project No. 1389). Prepared by E Read and Associates, Inc. for Southern California Edison Co., Eastern Hydro Division.

Read, E. and T. Salamunovich. 2019. Analysis of Riparian Vegetation and Aquatic Habitat: 2018 Field Season and Comparison to Previous Years, Rush Creek Project (FERC Project No. 1389). Prepared by E Read and Associates, Inc. and Normandeau Associates for Southern California Edison Co, Eastern Hydro Division.

SCE (Southern California Edison). 2017a. Pre-release Survey and Assessment Report, Rush Creek Emergency Project (FERC No. 1389). June 2017.

———. 2017b. Pre-Construction Biological Survey and Assessment Report, Rush Meadows Dam Project Area. Rush Creek (Phase II) Project (FERC No. 1389). August 2017.

USFWS (United States Fish and Wildlife Service). 2021. National Wetlands Inventory. Online database. U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C. Available at https://www.fws.gov/wetlands/data/mapper.html

TABLES

This Page Intentionally Left Blank

Table 4.9-1. Project-Affected Stream Reaches, Project Reservoirs, and Natural Lakes.

Reach Name	Stream Reach Length (miles)	Elevation Range (feet) (% gradient)	Type of Stream Reach	Description
Rush Creek				
Waugh Lake	1.51 (RM 22.24–23.75)	9,392[1]	—	Project Reservoir
Rush Creek Below Rush Meadow Dam	1.83 (RM 20.41–22.24)	9,036–9,371.6 (3.47%)	Project-affected Stream Reach	Moderate Gradient Mountain Stream
Gem Lake	0.93 (RM 19.48–20.41)	9,027.5[1]	—	Project Reservoir
Rush Creek Below Gem Dam	0.30 (RM 19.18–19.48)	8,539.2–9,008 (29.60%)	Project-affected Stream Reach	Steep Mountain Stream
Agnew Lake	0.58 (RM 18.60–19.18)	8,470[1]	—	Project Reservoir
Rush Creek Below Agnew Dam	0.40 (RM 18.2–18.60)	8,214–8,460 (11.65%)	Project-affected Stream Reach	Steep Mountain Stream
Rush Creek Horsetail Falls	0.54 (RM 17.66–18.2)	7,306.8–8,214 (31.82%)	Project-affected Stream Reach	Steep Mountain Stream
Rush Creek Above Silver Lake	0.94 (RM 16.72–17.66)	7,216.2–7,306.8 (1.83%)	Project-affected Stream Reach	Low-Gradient Meadow Stream[3]
Silver Lake	0.83 (RM 15.89–16.72)	7,215[2]	—	Natural Lake
Rush Creek Below Silver Lake	2.69 (RM 13.20–15.89)	7,131–7,214.7 (0.59%)	Project-affected Stream Reach	Low-Gradient Stream
South Rush Creek				
South Rush Creek	0.46 (RM 0.0–0.46)	7,221–7,551.7 (13.62%)	Project-affected Stream Reach	Steep Mountain Stream[3]

Notes: RM = River Mile

[1] Maximum seismic restriction elevation

[2] Approximate ordinary high water mark

[3] This stream reach has some very low gradient and some steeper gradient sections

Table 4.9-2. Wetland and Riparian Community Types Along/Associated with Project-Affected Stream Reaches, Project Reservoirs, and Natural Lakes.

Riparian/Wetland Community Types and Description
Forest Service CALVEG Alliances (Forest Service 2018)
Wet Meadows Alliance (HJ) This Alliance is partially composed of Sedges (*Carex* spp.), Rushes (*Juncus* spp.) and Spikerushes (*Eleocharis* spp.) and designates yearlong water availability, as in lakeshore, stream bank, perched water tables, and seep areas. Perennial forbs such as Western Bistort (*Polygonum bistortoides*), Monkeyflower (*Mimulus primuloides*) and Corn Lily (*Veratrum californicum*), shrub Willows (*Salix* spp.), Mountain Alder (*Alnus incana* ssp. *tenuifolia*) and Lodgepole Pine (*Pinus contorta* ssp. *murrayana*) may be associated with this high elevation montane alliance. Grasses and grasslike species such as King's Ricegrass (*Ptilagrostis kingii*), Intermediate Oatgrass (*Danthonia intermedia*), Weak Mannagrass (*Torreyochloa pallida*), Hairy Woodrush (*Luzula orestra*), Reedgrass (*Calamagrostis canadensis*) and Bentgrass (*Agrostis idahoensis*) may also be indicators of this type in the southern Sierras.
Willow Alliance (QO) This Alliance is dominated by mixed or single species of tree Willow (*Salix* spp.). It has been mapped most frequently on the east side of the Sierra Nevada where stream or pond conditions provide sufficient moisture in seven subsections at low to moderate elevations, mostly from about 2,600 to 7,400 ft (792 to 2,256 m). Riparian hardwoods such as Water Birch (*Betula occidentalis*) and Fremont Cottonwood (*Populus fremontii*) often occur in close proximity to these areas, while Great Basin upland shrub species such as Rabbitbrush (*Chrysothamnus* spp.), Interior Rose (*Rosa woodsii*), and Big Sagebrush (*Artemisia tridentata*) may occur in narrow canyons adjacent to this Alliance.
Quaking Aspen Alliance (QQ) Quaking Aspen (*Populus tremuloides*) forms clonal stands and dominates the hardwoods in this Alliance. In the southern Sierras, it occurs at high elevations as an indicator of moist conditions in association with Red Fir (*Abies magnifica*), Lodgepole Pine (*Pinus contorta* ssp. *murrayana*), Whitebark Pine (*Pinus albicaulis*), and Jeffrey Pine (*Pinus jeffreyi*). The Quaking Aspen Alliance has been mapped with some frequency in the Eastern Slopes Subsection, generally above an elevation of about 4,600 ft (1,402 m). In this eastside region, its associated shrubs have Great Basin affinities: Mountain Sagebrush (*Artemisia tridentata* ssp. *vaseyana*), Curlleaf Mountain Mahogany (*Cercocarpus ledifolius*) and Low Sagebrush (*Artemisia arbuscula*). It also occurs less commonly in seven other subsections. At higher elevations and under exposed conditions, Quaking Aspen stands may maintain a shrub-like form and never reach tree sizes.
Willow (Shrub) Alliance (WL) Shrub Willows (*Salix* spp.) may dominate stretches of low to high elevation streams, springs and seeps in the southern Sierras. Depending on location and elevation, species may include Geyer's (*Salix geyeriana*), Gray-leaved Sierra (*Salix orestera*), Lemmon's (*Salix lemmonii*), Narrow-leaved (*Salix exigua*), Shining (*Salix lucida*), Yellow (*Salix lutea*), or other Willows. This type has been mapped extensively over ten subsections, most frequently in the Glaciated Batholith, Eastern Slopes, Glaciated Batholith and Volcanic Flows, and Upper Batholith Subsections. On the eastside, it is often found adjacent to upland Great Basin types such as Low, Mountain and Big Sagebrushes (*Artemisia arbuscula*, *Artemisia tridentata* var. *vaseyana*, *Artemisia tridentata*), subalpine and upper montane trees such as Lodgepole Pine (*Pinus contorta* ssp. *murrayana*), Western White Pine (*Pinus monticola*), Red Fir (*Abies magnifica*), Whitebark Pine (*Pinus albicaulis*), Mountain Hemlock (*Tsuga mertensiana*) and Quaking Aspen (*Populus tremuloides*). Mesic shrubs of these elevations, such as Huckleberry Oak (*Quercus vaccinifolia*) also are often found near the Shrub Willow Alliance. As this type may occupy the wettest upland sites, the Wet Meadows Alliance is very frequently associated with it, as are riparian shrubs such as Blue Elderberry (*Sambucus mexicana*), White-stemmed Gooseberry (*Ribes inerme*) and California Blackberry (*Rubus ursinus*). The mapped elevation range of this alliance is extremely broad, ranging from about 3,000 to 12,000 ft (915 to 3,660 m).

USFWS NWI Cowardin Wetland Types (USFWS 2021)	
Freshwater Emergent Wetland	
PEM1C; PEM1F	• **System Palustrine (P)**: The Palustrine System includes all nontidal wetlands dominated by trees, shrubs, persistent emergents, emergent mosses or lichens, and all such wetlands that occur in tidal areas where salinity due to ocean-derived salts is below 0.5 parts per trillion. It also includes wetlands lacking such vegetation, but with all of the following four characteristics: (1) area less than 8 hectares (20 acres); (2) active wave-formed or bedrock shoreline features lacking; (3) water depth in the deepest part of basin less than 2.5 meters (8.2 feet) at low water; and (4) salinity due to ocean-derived salts less than 0.5 parts per trillion. • **Class Emergent (EM)**: Characterized by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. This vegetation is present for most of the growing season in most years. These wetlands are usually dominated by perennial plants. • **Subclass Persistent (1)**: Dominated by species that normally remain standing at least until the beginning of the next growing season. This subclass is found only in the Estuarine and Palustrine systems. • **Water Regime Seasonally Flooded (C)**: Surface water is present for extended periods especially early in the growing season, but is absent by the end of the growing season in most years. The water table after flooding ceases is variable, extending from saturated to the surface to a water table well below the ground surface. • **Water Regime Semipermanently Flooded (F)**: Surface water persists throughout the growing season in most years. When surface water is absent, the water table is usually at or very near the land surface.
Freshwater Forested/Shrub Wetland	
PFOA; PFOC	• **System Palustrine (P)**: The Palustrine System includes all nontidal wetlands dominated by trees, shrubs, persistent emergents, emergent mosses or lichens, and all such wetlands that occur in tidal areas where salinity due to ocean-derived salts is below 0.5 parts per trillion. It also includes wetlands lacking such vegetation, but with all of the following four characteristics: (1) area less than 8 hectares (20 acres); (2) active wave-formed or bedrock shoreline features lacking; (3) water depth in the deepest part of basin less than 2.5 meters (8.2 feet) at low water; and (4) salinity due to ocean-derived salts less than 0.5 parts per trillion. • **Class Forested (FO)**: Characterized by woody vegetation that is 6 meters tall or taller. • **Water Regime Temporary Flooded (A)**: Surface water is present for brief periods (from a few days to a few weeks) during the growing season, but the water table usually lies well below the ground surface for most of the season. • **Water Regime Seasonally Flooded (C)**: Surface water is present for extended periods especially early in the growing season, but is absent by the end of the growing season in most years. The water table after flooding ceases is variable, extending from saturated to the surface to a water table well below the ground surface.

Freshwater Forested/Shrub Wetland (continued)	
PSSB, PSSC, PSSCh	• **System Palustrine (P)**: The Palustrine System includes all nontidal wetlands dominated by trees, shrubs, persistent emergents, emergent mosses or lichens, and all such wetlands that occur in tidal areas where salinity due to ocean-derived salts is below 0.5 parts per trillion. It also includes wetlands lacking such vegetation, but with all of the following four characteristics: (1) area less than 8 hectares (20 acres); (2) active wave-formed or bedrock shoreline features lacking; (3) water depth in the deepest part of basin less than 2.5 meters (8.2 feet) at low water; and (4) salinity due to ocean-derived salts less than 0.5 parts per trillion. • **Class Scrub-Shrub (SS)**: Includes areas dominated by woody vegetation less than 6 meters (20 feet) tall. The species include true shrubs, young trees (saplings), and trees or shrubs that are small or stunted because of environmental conditions. • **Water Regime Seasonally Saturated (B):** The substrate is saturated at or near the surface for extended periods during the growing season, but unsaturated conditions prevail by the end of the season in most years. Surface water is typically absent, but may occur for a few days after heavy rain and upland runoff. • **Water Regime Seasonally Flooded (C)**: Surface water is present for extended periods especially early in the growing season, but is absent by the end of the growing season in most years. The water table after flooding ceases is variable, extending from saturated to the surface to a water table well below the ground surface. • **Special Modifier Diked/Impounded (h)**: These wetlands have been created or modified by a man-made barrier or dam that obstructs the inflow or outflow of water.

Table 4.9-3. Acreage of CALVEG Riparian Habitats, NWI Wetland Types, and Other Wetland/Riparian Habitats.

Project-affected Reach/Project Reservoirs/Silver Lake	CALVEG Riparian Habitats (Forest Service 2018)				NWI Wetland Types (USFWS 2021)		Other Riparian Habitats as Documented in SCE Studies
	HJ: Wet Meadows Alliance	QO: Willow Alliance	QQ: Quaking Aspen Alliance	WL: Willow (Shrub) Alliance	Freshwater Emergent Wetland	Freshwater Forested/ Shrub Wetland	
Rush Creek							
Waugh Lake	—	—	—	—	Present[1]	Present[1]	Present[2]
Rush Creek Below Rush Meadow Dam	—	—	—	—	1.45	—	3.96
Gem Lake	—	—	5.05	—	Present[1]	Present[1]	Present[2]
Rush Creek Below Gem Dam	—	—	—	3.96	—	—	—
Agnew Lake	—	—	—	33.83	Present[1]	—	0.41
Rush Creek Below Agnew Dam	—	—	—	—	—	—	2.80
Rush Creek Horsetail Falls	—	—	0.66	—	—	—	—
Rush Creek Above Silver Lake[3]	33.55	26.05			23.19	37.20	—
Silver Lake[3]	—	—	5.27	—	—	—	—
Rush Creek Below Silver Lake	—	—	37.10	6.38	—	25.21	—
South Rush Creek							
South Rush Creek	—	—	—	—	—	0.49	—

Notes: — = Indicates that the extent of wetland or riparian habitat is unknown/undetermined based on existing information.

[1] NWI identifies thin bands of freshwater emergent and/or freshwater forested/shrub wetlands along small drainages entering Waugh Lake, Gem Lake, and Agnew Lake.

[2] SCE identified riparian habitat along transects within the littoral zone of Waugh and Gem Lake (Psomas 2017). Habitat was not mapped or quantified. Refer to Section 4.9.3 for a description of the habitat; and to Map 4.9-2 for a depiction of the area in which the transect studies were implemented.

[3] Rush Creek above Silver Lake and Silver Lake itself are contained within one broad floodplain, with several additional inputs (e.g., Reversed Creek). For the purpose of quantification, we attributed all wetland/riparian habitats occurring upstream of the southern shoreline of Silver Lake to Rush Creek. All wetland/riparian habitats occurring downstream of the southern shoreline of Silver Lake are attributed to Silver Lake.

Table 4.9-4. Riparian and Wetland Special-Status Plants, Invasive Plants, and Special-Status Wildlife Known to Occur or Potentially Occurring along the Project-Affected Stream Reaches and Associated with Project Reservoirs and Silver Lake.

Scientific Name Common Name	Status	Potential for Occurrence		Riparian and Wetland Habitat Types Previously Documented						
				CALVEG Riparian Habitats (Forest Service 2018)				NWI Wetland Types (USFWS 2021)		
		Known to Occur	May Potentially Occur	HJ: Wet Meadows Alliance	QO: Willow Alliance	QQ: Quaking Aspen Alliance	WL: Willow (Shrub) Alliance	Freshwater Emergent Wetland	Freshwater Forested/Shrub Wetland	Other Riparian Habitats as Documented in SCE Studies
Special-Status Plants										
Agrostis humilis alpine bentgrass	FSCC, 2B.3		X	X				X		
Astragalus lemmonii Lemmon's milk-vetch	FSCC, 1B.2		X	X				X		
Botrychium crenulatum scalloped moonwort	FSCC, 2B.2		X	X	X	X	X	X	X	X
Botrychium lineare slender moonwort	FSCC, 1B.1		X	X	X	X	X	X	X	X
Botrychium lunaria common moonwort	2B.3		X	X	X	X	X	X	X	X
Botrychium paradoxum paradox moonwort	2B.1		X	X				X		

Scientific Name Common Name	Status	Potential for Occurrence		Riparian and Wetland Habitat Types Previously Documented						
				CALVEG Riparian Habitats (Forest Service 2018)				NWI Wetland Types (USFWS 2021)		
		Known to Occur	May Potentially Occur	HJ: Wet Meadows Alliance	QO: Willow Alliance	QQ: Quaking Aspen Alliance	WL: Willow (Shrub) Alliance	Freshwater Emergent Wetland	Freshwater Forested/Shrub Wetland	Other Riparian Habitats as Documented in SCE Studies
Bruchia bolanderi Bolander's bruchia	FSCC, 4.2		X	X	X	X	X	X	X	X
Carex idahoa Idaho sedge	FSCC, 2B.3		X	X	X	X	X	X	X	X
Carex petasata Liddon's sedge	FSCC, 2B.3		X	X				X		
Carex praticola northern meadow sedge	FSCC, 2B.2		X	X				X		
Carex scirpoidea ssp. *pseudoscirpoidea* western single-spiked sedge	FSCC, 2B.2		X	X	X	X	X	X	X	X
Carex stevenii Steven’s sedge	FSCC, 2B.2		X	X	X	X	X	X	X	X
Carex vallicola western valley sedge	FSCC, 2B.3		X	X	X	X	X	X	X	X
Cinna bolanderi Bolander's woodreed	FSCC, 1B.2		X	X	X	X	X	X	X	X

Scientific Name Common Name	Status	Potential for Occurrence		Riparian and Wetland Habitat Types Previously Documented						
				CALVEG Riparian Habitats (Forest Service 2018)				NWI Wetland Types (USFWS 2021)		Other Riparian Habitats as Documented in SCE Studies
		Known to Occur	May Potentially Occur	HJ: Wet Meadows Alliance	QO: Willow Alliance	QQ: Quaking Aspen Alliance	WL: Willow (Shrub) Alliance	Freshwater Emergent Wetland	Freshwater Forested/Shrub Wetland	
Draba praealta tall draba	2B.3		X	X	X	X	X	X	X	X
Festuca minutiflora small-flowered fescue	2B.3		X	X	X	X	X	X	X	X
Helodium blandowii Blandow's bog moss	FSCC, 2B.3		X	X				X		
Kobresia myosuroides (= bellardii) seep kobresia	2B.2		X	X	X	X	X	X	X	X
Lupinus lepidus var. *culbertsonii* Hockett Meadows lupine	1B.3		X	X	X	X	X	X	X	X
Lupinus padre-crowleyi Father Crowley's lupine	SR, FSCC, 1B.2		X		X	X	X		X	X
Meesia longiseta long seta hump moss	2B.3		X	X	X	X	X	X	X	X
Meesia uliginosa broad-nerved hump moss	2B.2		X	X				X		

Scientific Name Common Name	Status	Potential for Occurrence		Riparian and Wetland Habitat Types Previously Documented						
				CALVEG Riparian Habitats (Forest Service 2018)				NWI Wetland Types (USFWS 2021)		
		Known to Occur	May Potentially Occur	HJ: Wet Meadows Alliance	QO: Willow Alliance	QQ: Quaking Aspen Alliance	WL: Willow (Shrub) Alliance	Freshwater Emergent Wetland	Freshwater Forested/Shrub Wetland	Other Riparian Habitats as Documented in SCE Studies
Parnassia parviflora small-flowered grass-of-Parnassus	2B.2		X	X	X	X	X	X	X	X
Pedicularis crenulata scalloped-leaved lousewort	2B.2		X	X	X	X	X	X	X	X
Pohlia tundrae tundra thread moss	2B.3		X	X				X		
Polyctenium williamsiae Williams' combleaf	FSCC, 1B.2		X	X	X	X	X	X	X	X
Potamogeton praelongus white-stemmed pondweed	2B.3		X	X				X		
Potamogeton robbinsii Robbins' pondweed	2B.3		X	X				X		
Ranunculus hydrocharoides frog's-bit buttercup	FSCC, 2B.1		X	X	X	X	X	X	X	X
Sabulina stricta bog sandwort	2B.3	X		X	X	X	X	X	X	X

Scientific Name Common Name	Status	Potential for Occurrence		Riparian and Wetland Habitat Types Previously Documented						
				CALVEG Riparian Habitats (Forest Service 2018)				NWI Wetland Types (USFWS 2021)		
		Known to Occur	May Potentially Occur	HJ: Wet Meadows Alliance	QO: Willow Alliance	QQ: Quaking Aspen Alliance	WL: Willow (Shrub) Alliance	Freshwater Emergent Wetland	Freshwater Forested/Shrub Wetland	Other Riparian Habitats as Documented in SCE Studies
Salix brachycarpa var. *brachycarpa* short-fruited willow	2B.3		X	X	X	X	X	X	X	X
Sphaeromeria potentilloides var. *nitrophila* fivefinger chickensage (alkali tansy-sage)	FSCC, 2B.2		X	X				X		
Thelypodium integrifolium ssp. *complanatum* foxtail thelypodium	FSCC, 2B.2		X	X				X		
Trichophorum pumilum little bulrush	FSCC, 2B.2		X	X	X	X	X	X	X	X
Trifolium bolanderi Bolander's clover	1B.2		X	X	X	X	X	X	X	X
Triglochin palustris marsh arrow-grass	2B.3		X	X	X	X	X	X	X	X
Viola pinetorum ssp. *grisea* gray-leaved violet	1B.2		X	X	X	X	X	X	X	X

Scientific Name Common Name	Status	Potential for Occurrence		Riparian and Wetland Habitat Types Previously Documented						
				CALVEG Riparian Habitats (Forest Service 2018)				NWI Wetland Types (USFWS 2021)		
		Known to Occur	May Potentially Occur	HJ: Wet Meadows Alliance	QO: Willow Alliance	QQ: Quaking Aspen Alliance	WL: Willow (Shrub) Alliance	Freshwater Emergent Wetland	Freshwater Forested/Shrub Wetland	Other Riparian Habitats as Documented in SCE Studies
Invasive Plants										
Acroptilon repens Russian knapweed	High/ Eradicate		X		X	X	X		X	X
Ailanthus altissima tree-of-heaven	Moderate/ Eradicate		X		X	X	X		X	X
Bassia hyssopifolia five-hook bassia (bassia)	Low/Contain		X	X	X	X	X	X	X	X
Bromus madritensis ssp*. rubens* red brome	Locally high; generally low/Contain		X		X	X	X		X	X
Centaurea stoebe ssp*. micranthos (= maculosa)* spotted knapweed	High/ Eradicate		X		X	X	X		X	X
Cirsium vulgare bull thistle	Moderate/ Eradicate		X	X	X	X	X	X	X	X
Descurainia sophia tansy mustard	Very low/ Contain		X		X	X	X		X	X

Scientific Name Common Name	Status	Potential for Occurrence		Riparian and Wetland Habitat Types Previously Documented						
				CALVEG Riparian Habitats (Forest Service 2018)				NWI Wetland Types (USFWS 2021)		
		Known to Occur	May Potentially Occur	HJ: Wet Meadows Alliance	QO: Willow Alliance	QQ: Quaking Aspen Alliance	WL: Willow (Shrub) Alliance	Freshwater Emergent Wetland	Freshwater Forested/Shrub Wetland	Other Riparian Habitats as Documented in SCE Studies
Elaeagnus angustifolia Russian olive	Moderate/ Eradicate		X		X	X	X		X	X
Iris missouriensis western blue flag	— (on list)		X	X	X	X	X	X	X	X
Lepidium chalepense (=Cardaria chalepensis) *l*ens-podded hoary cress	High/ Eradicate		X	X	X	X	X	X	X	X
Lepidium draba (=Cardaria draba) heart-podded hoary cress	High/ Eradicate		X	X	X	X	X	X	X	X
Lepidium latifolium perennial pepperweed	High/ Eradicate		X	X	X	X	X	X	X	X
Lotus corniculatus birdfoot trefoil	Moderate/ Eradicate		X	X	X	X	X	X	X	X
Melilotus albus white sweet clover	Moderate/ Contain		X		X	X	X		X	X

Scientific Name Common Name	Status	Potential for Occurrence		Riparian and Wetland Habitat Types Previously Documented						
				CALVEG Riparian Habitats (Forest Service 2018)				NWI Wetland Types (USFWS 2021)		
		Known to Occur	May Potentially Occur	HJ: Wet Meadows Alliance	QO: Willow Alliance	QQ: Quaking Aspen Alliance	WL: Willow (Shrub) Alliance	Freshwater Emergent Wetland	Freshwater Forested/Shrub Wetland	Other Riparian Habitats as Documented in SCE Studies
Sisymbrium irio London rocket	Very low/ Contain		X		X	X	X		X	X
Spartium junceum Spanish broom	High/ Eradicate		X		X	X	X		X	X
Tamarix aphylla athel	High/ Eradicate		X		X	X	X		X	X
Tamarix chinensis Chinese tamarisk	High/ Eradicate		X		X	X	X		X	X
Tamarix parviflora smallflower tamarisk	High/ Eradicate		X		X	X	X		X	X
Tamarix ramosissima saltcedar	High/ Eradicate		X		X	X	X		X	X
Taraxacum officinale dandelion	Very low/ Contain		X		X	X	X		X	X
Trifolium repens white clover	Low/Contain		X	X	X	X	X	X	X	X

Scientific Name Common Name	Status	Potential for Occurrence		Riparian and Wetland Habitat Types Previously Documented						
				CALVEG Riparian Habitats (Forest Service 2018)				NWI Wetland Types (USFWS 2021)		
		Known to Occur	May Potentially Occur	HJ: Wet Meadows Alliance	QO: Willow Alliance	QQ: Quaking Aspen Alliance	WL: Willow (Shrub) Alliance	Freshwater Emergent Wetland	Freshwater Forested/Shrub Wetland	Other Riparian Habitats as Documented in SCE Studies
Verbascum thapsus woolly (common) mullein	Moderate/ Contain		X	X	X	X	X	X	X	X
Special-Status Wildlife										
Rana sierrae Sierra Nevada yellow-legged frog	FE, ST	X		X	X	X	X	X	X	X
Anaxyrus canorus Yosemite toad	FT, CSC	X		X	X	X	X	X	X	X
Empidonax traillii brewsteri little willow flycatcher	BCC, FSCC, SE	X		X	X	X	X	X	X	X
Speyeria nokomis apacheana apache fritillary butterfly	FSCC		X	X	X	X	X	X	X	X
Falco peregrinus anatum American peregrine falcon	BCC, CFP		X	X	X	X	X	X	X	X
Asio flammeus short-eared owl	CSC (nesting)		X	X				X		
Asio otus long-eared owl	CSC (nesting)		X		X	X	X		X	X

Scientific Name Common Name	Status	Potential for Occurrence		Riparian and Wetland Habitat Types Previously Documented						
				CALVEG Riparian Habitats (Forest Service 2018)				NWI Wetland Types (USFWS 2021)		
		Known to Occur	May Potentially Occur	HJ: Wet Meadows Alliance	QO: Willow Alliance	QQ: Quaking Aspen Alliance	WL: Willow (Shrub) Alliance	Freshwater Emergent Wetland	Freshwater Forested/Shrub Wetland	Other Riparian Habitats as Documented in SCE Studies
Cypseloides niger black swift	BCC, CSC (nesting)		X	X	X	X	X	X	X	X
Stellula calliope calliope hummingbird	BCC		X	X	X	X	X	X	X	X
Haliaeetus leucocephalus bald eagle	Eagle Act, BCC, FSCC, SE, CFP	X		X	X	X	X	X	X	X
Setophaga petechia yellow warbler	CSC (nesting)		X	X	X	X	X	X	X	X
Empidonax traillii brewsteri little willow flycatcher	BCC, FSCC, SE	X		X	X	X	X	X	X	X
Haemorhous cassinii Cassin's finch	BCC,		X	X	X	X	X	X	X	X
Sorex lyelli Mt. Lyell shrew	CSC		X		X	X	X		X	X
Lepus americanus tahoensis Sierra Nevada snowshoe hare	CSC		X		X	X	X		X	X

Scientific Name Common Name	Status	Potential for Occurrence		Riparian and Wetland Habitat Types Previously Documented						
				CALVEG Riparian Habitats (Forest Service 2018)				NWI Wetland Types (USFWS 2021)		
		Known to Occur	May Potentially Occur	HJ: Wet Meadows Alliance	QO: Willow Alliance	QQ: Quaking Aspen Alliance	WL: Willow (Shrub) Alliance	Freshwater Emergent Wetland	Freshwater Forested/Shrub Wetland	Other Riparian Habitats as Documented in SCE Studies
Aplodontia rufa californica Sierra Nevada mountain beaver	CSC		X		X	X	X		X	X
Bassariscus astutus ringtail	CFP		X		X	X	X		X	X

Federal Status

BCC = Birds of Conservation Concern
Eagle Act = Bald and Golden Eagle Protection Act
FC = Candidate Species
FE = Federal Endangered
FSCC = Inyo National Forest Service Species of Conservation Concern
FT = Federal Threatened

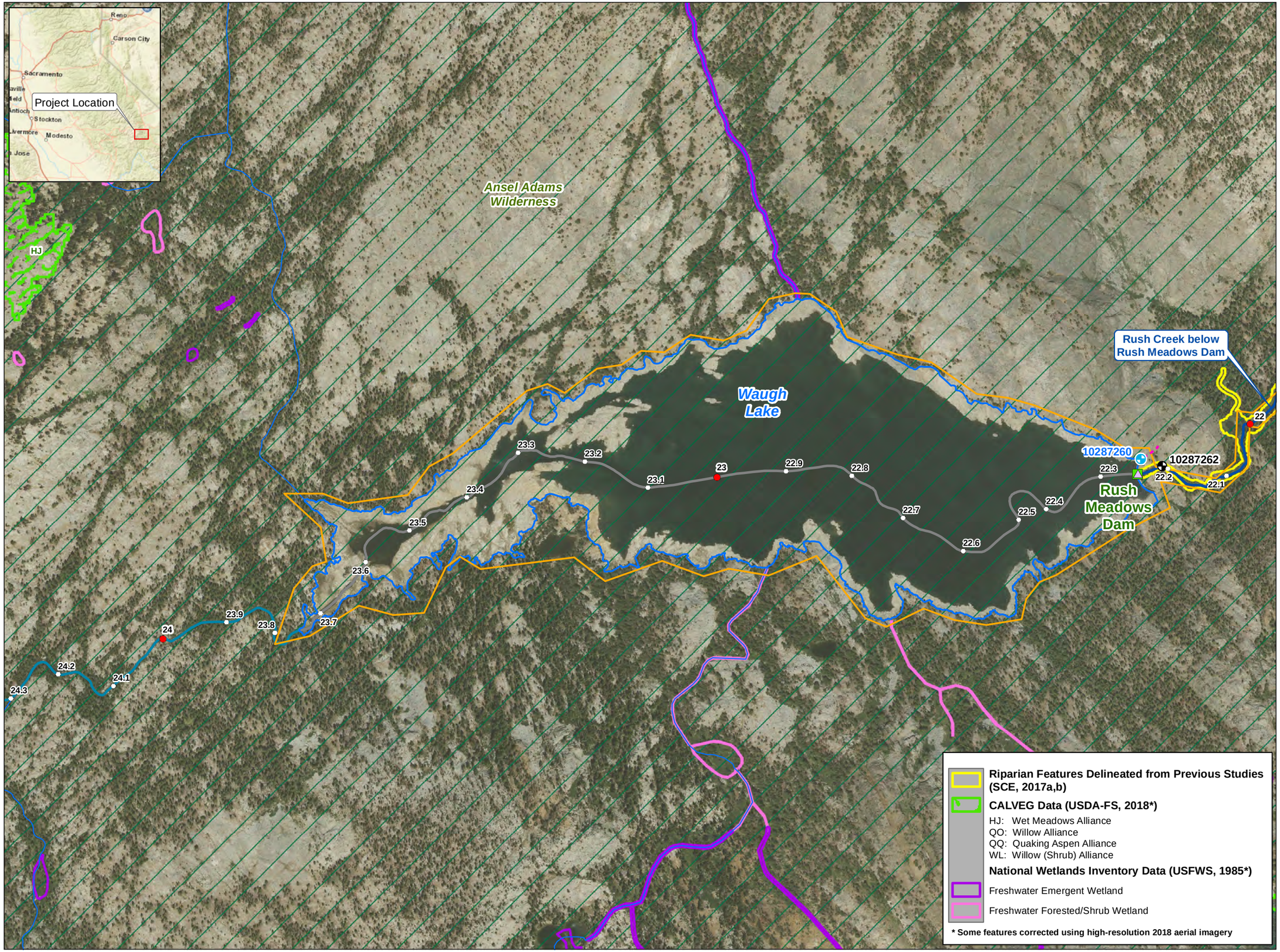
State Status

CFP = California Fully Protected
CSC = California Species of Special Concern
SR = California Rare
ST = California Threatened
SE = California Endangered

CRPR = California Native Plant Society Rare Plant Rank
1B = rare, threatened or endangered in California and elsewhere
2B = rare in California but more common elsewhere
3 = need more information
4 = plants of limited distribution, a watch list
_.1 = Seriously threatened in California (over 80% of occurrences threatened/high degree and immediacy of threat)
_.2 = Moderately threatened in California (20 – 80% of occurrences threatened)
_.3 = Not very threatened in California (less than 20% of occurrences threatened or no current threats known)

MAPS

This Page Intentionally Left Blank



SCE Facilities

- Powerhouse
- Dam
- Stream Gage
- Reservoir Gage
- Ancillary Facility
- Helicopter Landing Site
- Water Conveyance Feature
- Tailrace
- Flowline / Penstock
- Power or Communication Line
- Tramway
- Project Road
- Project Trail
- FERC Project Boundary

Other Features

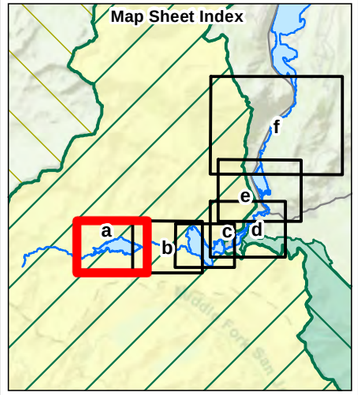
- Watercourse
- Water Body
- River Mile / 10th Mile

Land Management

National Wilderness Area**

- Ansel Adams Wilderness
- Owens River Headwaters Wilderness

**NOTE: Ansel Adams Wilderness and Owens River Headwaters Wilderness are located on USFS Lands



SOUTHERN CALIFORNIA EDISON®
An EDISON INTERNATIONAL® Company

Rush Creek Project (FERC 1389)

Map 4.9-1a

Floodplains Along Project-Affected Stream Reaches and Littoral Zones Associated with Project Reservoirs and Natural Lakes

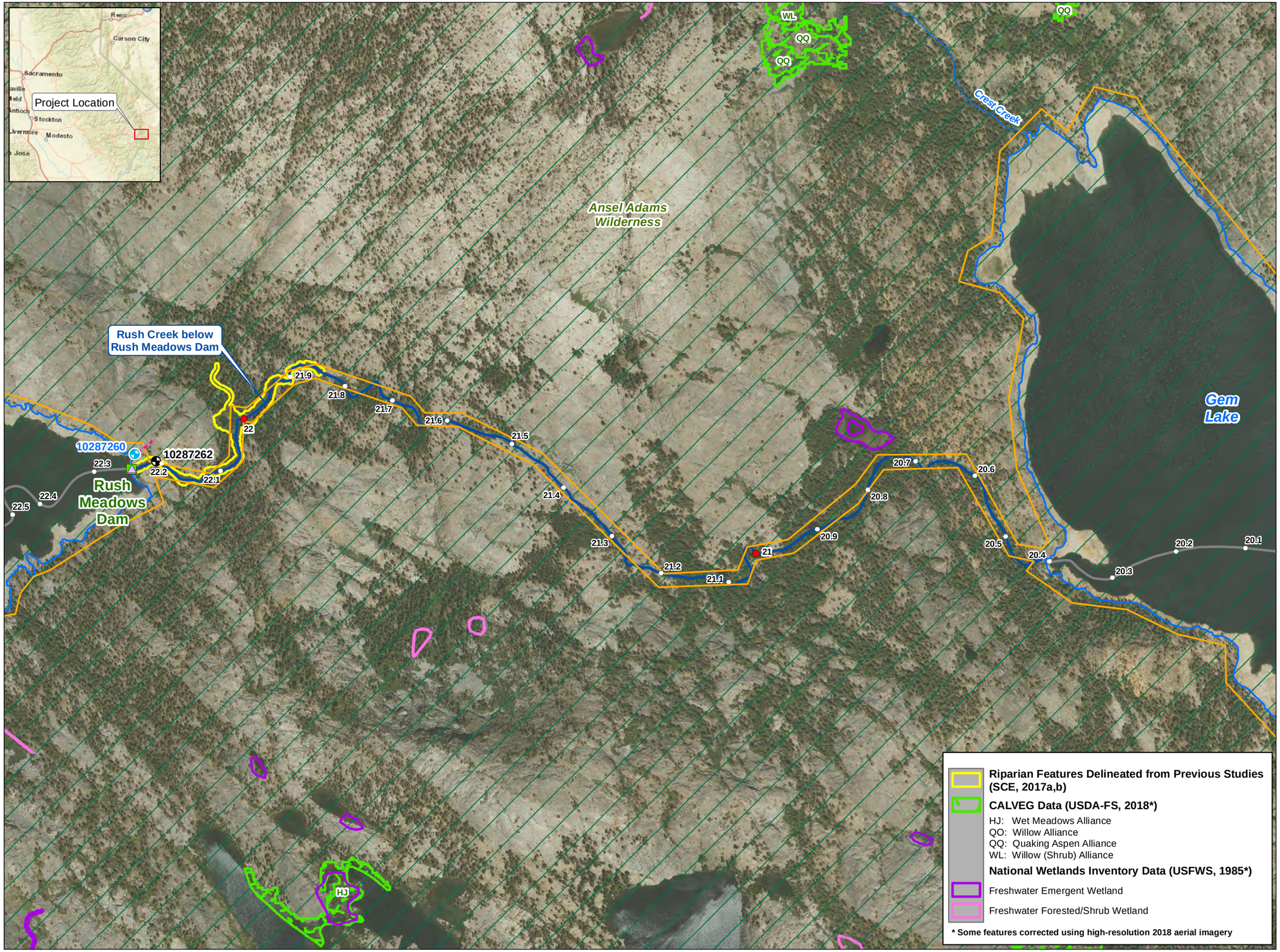
0 250 500 Feet

Date: 8/18/2021

Projection: UTM Zone 11
Datum: NAD 83

C:\GIS\Cardno\30735240_SCE_EasternHydro\map\Rush Creek\TerrestrialMaps\SCE_RUSH_CREEK_Floodplains_ProjReaches_LittoralZones_17i11i_01.mxd

This Page Intentionally Left Blank



SCE Facilities

- Powerhouse
- Dam
- Stream Gage
- Reservoir Gage
- Ancillary Facility
- Helicopter Landing Site
- Water Conveyance Feature
- Tailrace
- Flowline / Penstock
- Power or Communication Line
- Tramway
- Project Road
- Project Trail
- FERC Project Boundary

Other Features

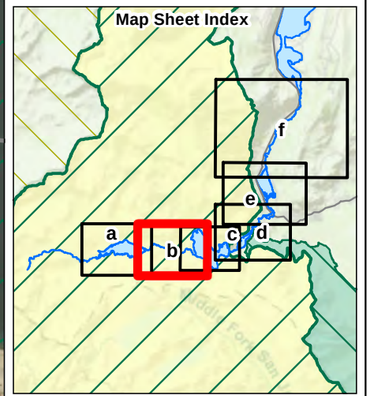
- Watercourse
- Water Body
- River Mile / 10th Mile

Land Management

National Wilderness Area**

- Ansel Adams Wilderness
- Owens River Headwaters Wilderness

**NOTE: Ansel Adams Wilderness and Owens River Headwaters Wilderness are located on USFS Lands



SOUTHERN CALIFORNIA EDISON®
An EDISON INTERNATIONAL® Company

Rush Creek Project (FERC 1389)

Map 4.9-1b

Floodplains Along Project-Affected Stream Reaches and Littoral Zones Associated with Project Reservoirs and Natural Lakes

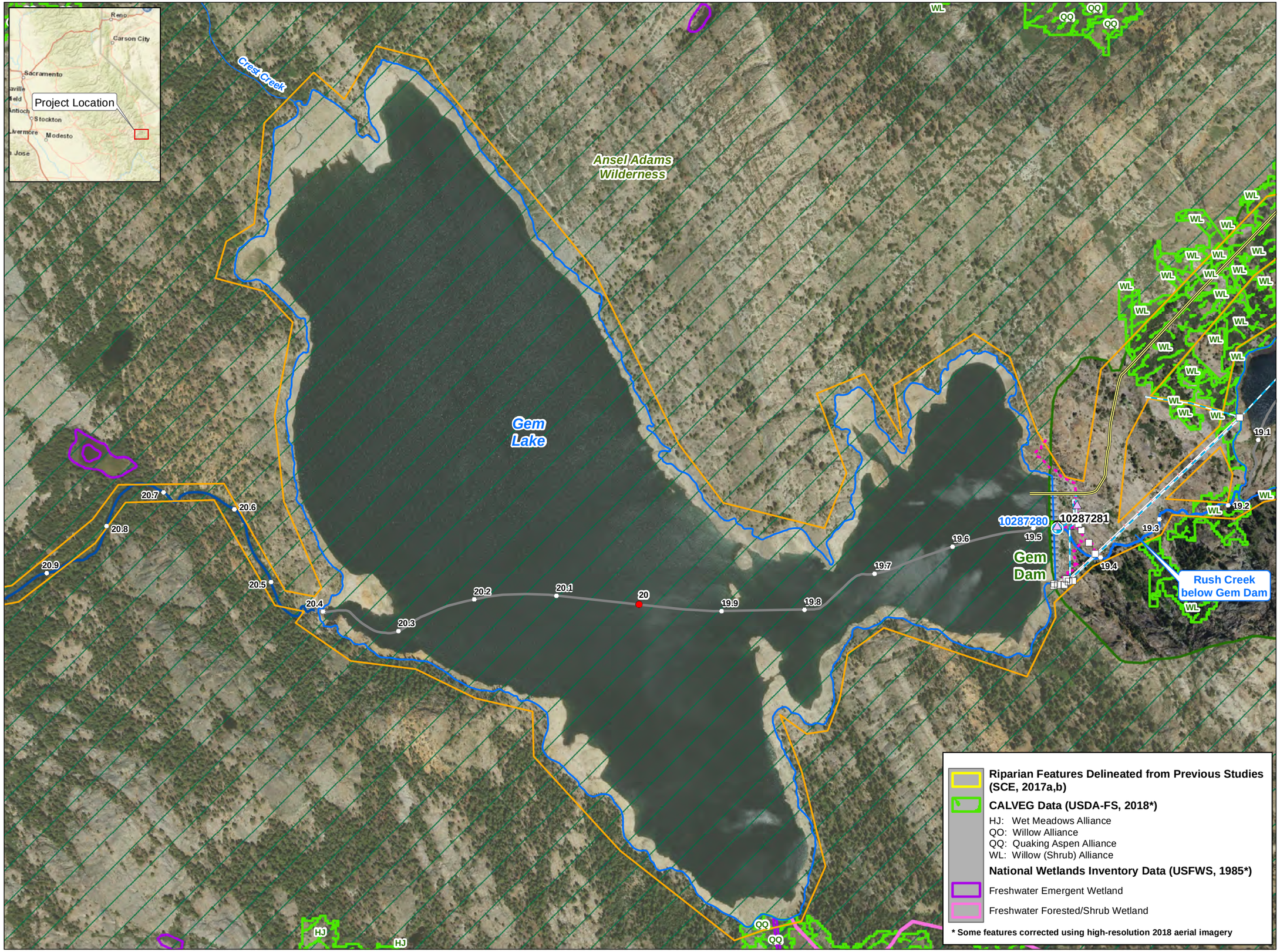
0 250 500 Feet

Date: 8/18/2021

Projection: UTM Zone 11
Datum: NAD 83

C:\GIS\Cardno\30735240_SCE_EasternHydro\map\Rush Creek\TerrestrialMaps\SCE_RUSH_CREEK_Floodplains_ProjReaches_LittoralZones_17i11i_01.mxd

This Page Intentionally Left Blank



SCE Facilities

- Powerhouse
- Dam
- Stream Gage
- Reservoir Gage
- Ancillary Facility
- Helicopter Landing Site
- Water Conveyance Feature
- Tailrace
- Flowline / Penstock
- Power or Communication Line
- Tramway
- Project Road
- Project Trail
- FERC Project Boundary

Other Features

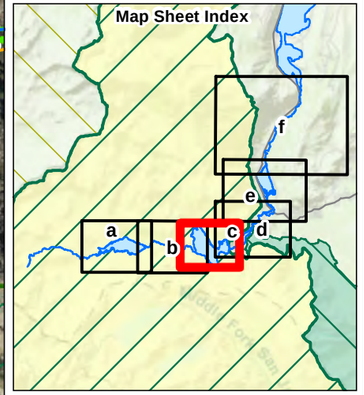
- Watercourse
- Water Body
- River Mile / 10th Mile

Land Management

National Wilderness Area**

- Ansel Adams Wilderness
- Owens River Headwaters Wilderness

**NOTE: Ansel Adams Wilderness and Owens River Headwaters Wilderness are located on USFS Lands



Riparian Features Delineated from Previous Studies (SCE, 2017a,b)

CALVEG Data (USDA-FS, 2018*)

HJ: Wet Meadows Alliance
QO: Willow Alliance
QQ: Quaking Aspen Alliance
WL: Willow (Shrub) Alliance

National Wetlands Inventory Data (USFWS, 1985*)

Freshwater Emergent Wetland

Freshwater Forested/Shrub Wetland

*** Some features corrected using high-resolution 2018 aerial imagery**

SOUTHERN CALIFORNIA EDISON®
An EDISON INTERNATIONAL® Company

Rush Creek Project (FERC 1389)

Map 4.9-1c

Floodplains Along Project-Affected Stream Reaches and Littoral Zones Associated with Project Reservoirs and Natural Lakes

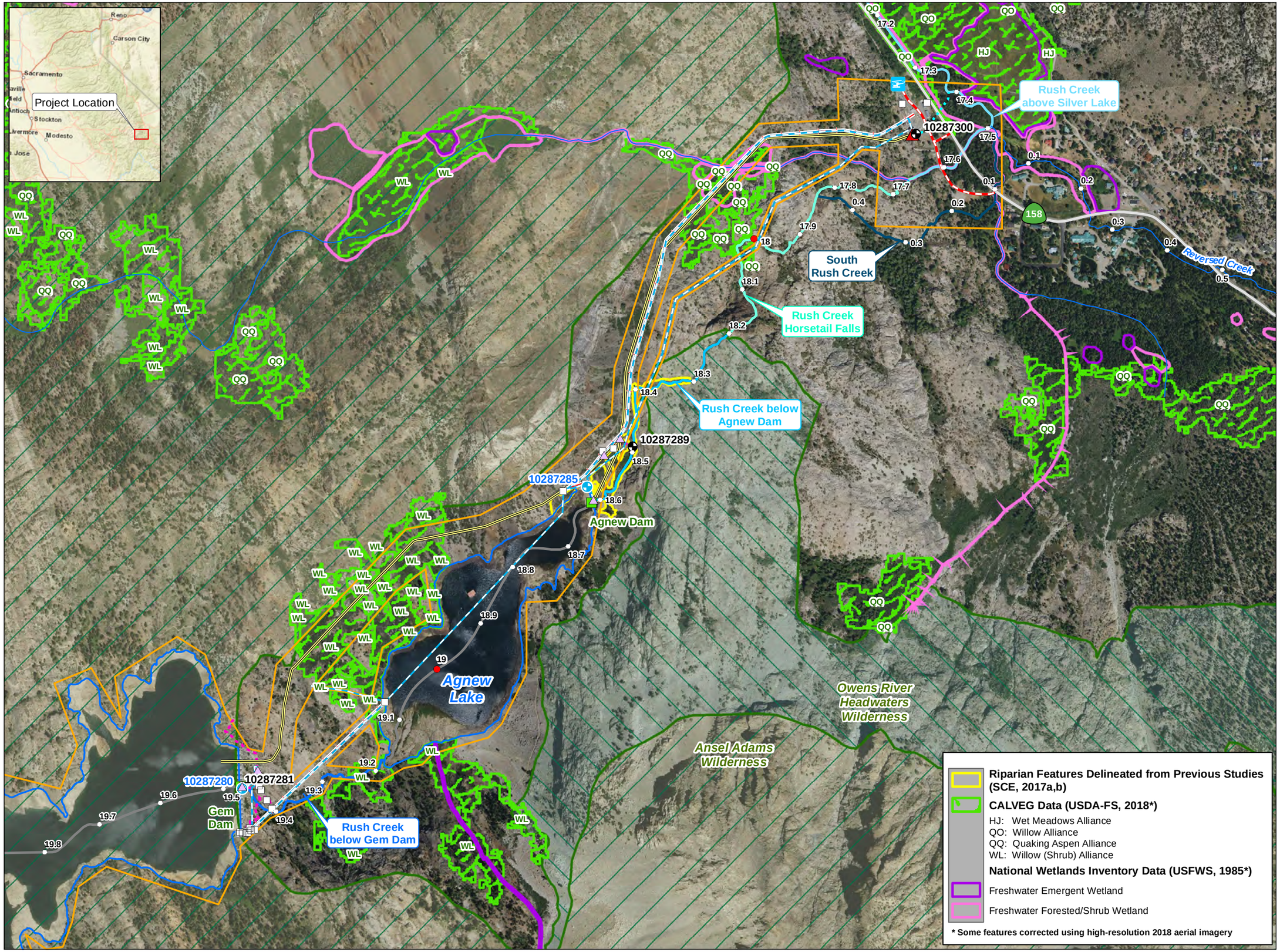
0 250 500 Feet

Date: 8/18/2021

Projection: UTM Zone 11
Datum: NAD 83

C:\GIS\Cardno\30735240_SCE_EasternHydro\map\Rush Creek\TerrestrialMaps\SCE_RUSH_CREEK_Floodplains_ProjReaches_LittoralZones_17i11i_01.mxd

This Page Intentionally Left Blank



SCE Facilities

- Powerhouse
- Dam
- Stream Gage
- Reservoir Gage
- Ancillary Facility
- Helicopter Landing Site
- Water Conveyance Feature
- Tailrace
- Flowline / Penstock
- Power or Communication Line
- Tramway
- Project Road
- Project Trail
- FERC Project Boundary

Other Features

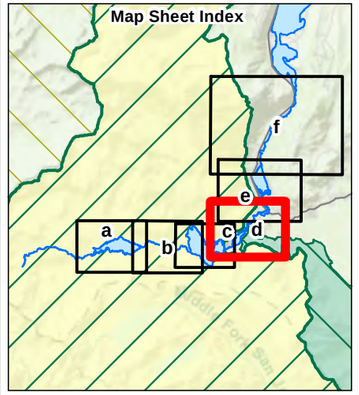
- Watercourse
- Water Body
- River Mile / 10th Mile

Land Management

National Wilderness Area**

- Ansel Adams Wilderness
- Owens River Headwaters Wilderness

**NOTE: Ansel Adams Wilderness and Owens River Headwaters Wilderness are located on USFS Lands



Riparian Features Delineated from Previous Studies (SCE, 2017a,b)

CALVEG Data (USDA-FS, 2018*)

HJ: Wet Meadows Alliance
QO: Willow Alliance
QQ: Quaking Aspen Alliance
WL: Willow (Shrub) Alliance

National Wetlands Inventory Data (USFWS, 1985*)

Freshwater Emergent Wetland

Freshwater Forested/Shrub Wetland

*** Some features corrected using high-resolution 2018 aerial imagery**

SOUTHERN CALIFORNIA EDISON®
An EDISON INTERNATIONAL® Company

Rush Creek Project (FERC 1389)

Map 4.9-1d

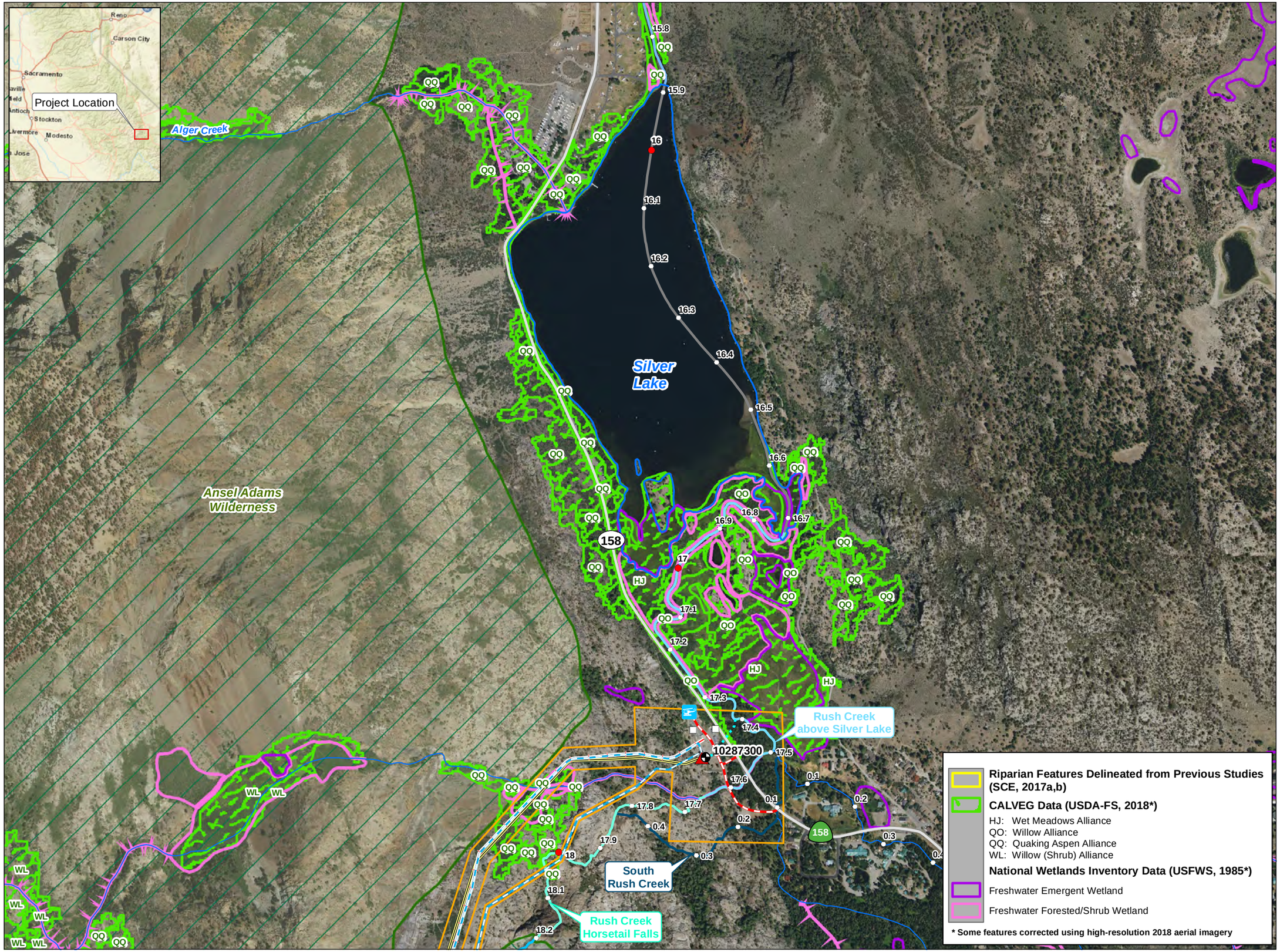
Floodplains Along Project-Affected Stream Reaches and Littoral Zones Associated with Project Reservoirs and Natural Lakes

0 250 500 Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 8/18/2021

This Page Intentionally Left Blank



SCE Facilities

- Powerhouse
- Dam
- Stream Gage
- Reservoir Gage
- Ancillary Facility
- Helicopter Landing Site
- Water Conveyance Feature
- Tailrace
- Flowline / Penstock
- Power or Communication Line
- Tramway
- Project Road
- Project Trail
- FERC Project Boundary

Other Features

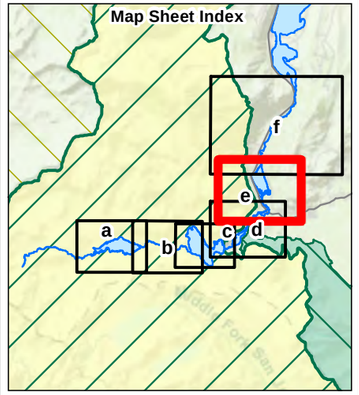
- Watercourse
- Water Body
- River Mile / 10th Mile

Land Management

National Wilderness Area**

- Ansel Adams Wilderness
- Owens River Headwaters Wilderness

**NOTE: Ansel Adams Wilderness and Owens River Headwaters Wilderness are located on USFS Lands



Riparian Features Delineated from Previous Studies (SCE, 2017a,b)

CALVEG Data (USDA-FS, 2018*)

HJ: Wet Meadows Alliance
QO: Willow Alliance
QQ: Quaking Aspen Alliance
WL: Willow (Shrub) Alliance

National Wetlands Inventory Data (USFWS, 1985*)

Freshwater Emergent Wetland

Freshwater Forested/Shrub Wetland

*** Some features corrected using high-resolution 2018 aerial imagery**

SOUTHERN CALIFORNIA EDISON®
An EDISON INTERNATIONAL® Company

Rush Creek Project (FERC 1389)

Map 4.9-1e

Floodplains Along Project-Affected Stream Reaches and Littoral Zones Associated with Project Reservoirs and Natural Lakes

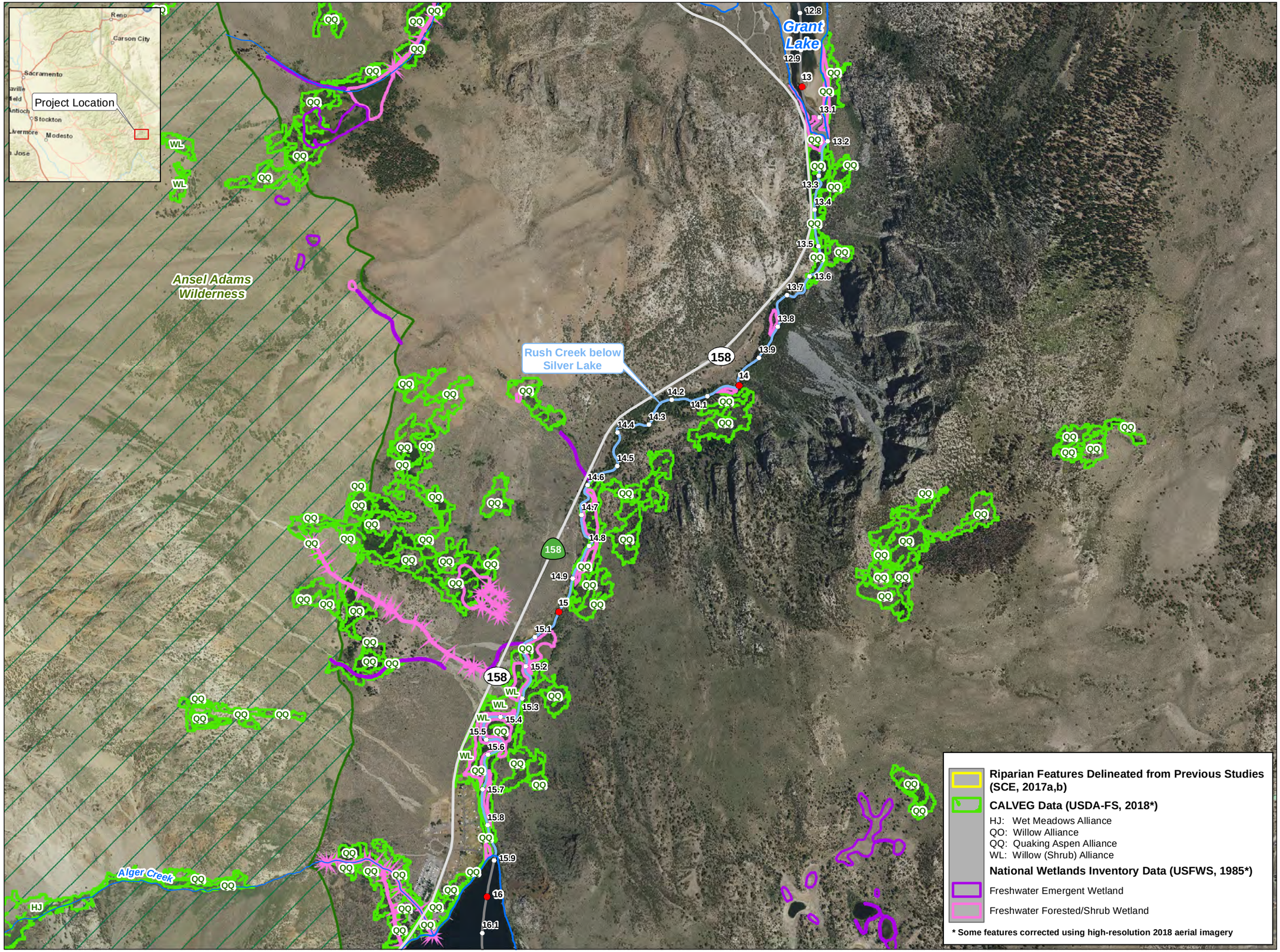
0 250 500 Feet

Date: 8/18/2021

Projection: UTM Zone 11
Datum: NAD 83

C:\GIS\Cardno\30735240_SCE_EasternHydro\map\Rush Creek\TerrestrialMaps\SCE_RUSH_CREEK_Floodplains_ProjReaches_LittoralZones_17i11i_01.mxd

This Page Intentionally Left Blank



Riparian Features Delineated from Previous Studies (SCE, 2017a,b)

CALVEG Data (USDA-FS, 2018*)

HJ: Wet Meadows Alliance
QO: Willow Alliance
QQ: Quaking Aspen Alliance
WL: Willow (Shrub) Alliance

National Wetlands Inventory Data (USFWS, 1985*)

Freshwater Emergent Wetland

Freshwater Forested/Shrub Wetland

*** Some features corrected using high-resolution 2018 aerial imagery**

SCE Facilities

- Powerhouse
- Dam
- Stream Gage
- Reservoir Gage
- Ancillary Facility
- Helicopter Landing Site
- Water Conveyance Feature
- Tailrace
- Flowline / Penstock
- Power or Communication Line
- Tramway
- Project Road
- Project Trail
- FERC Project Boundary

Other Features

- Watercourse
- Water Body
- River Mile / 10th Mile

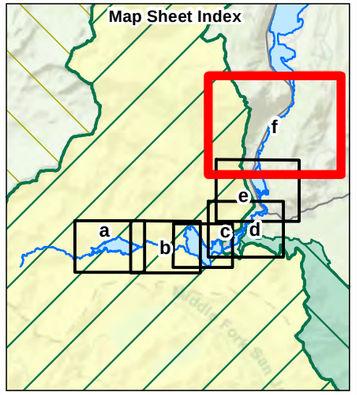
Land Management

National Wilderness Area**

- Ansel Adams Wilderness
- Owens River Headwaters Wilderness

**NOTE: Ansel Adams Wilderness and Owens River Headwaters Wilderness are located on USFS Lands

Map Sheet Index



SOUTHERN CALIFORNIA EDISON®
An EDISON INTERNATIONAL® Company

Rush Creek Project (FERC 1389)

Map 4.9-1f

Floodplains Along Project-Affected Stream Reaches and Littoral Zones Associated with Project Reservoirs and Natural Lakes

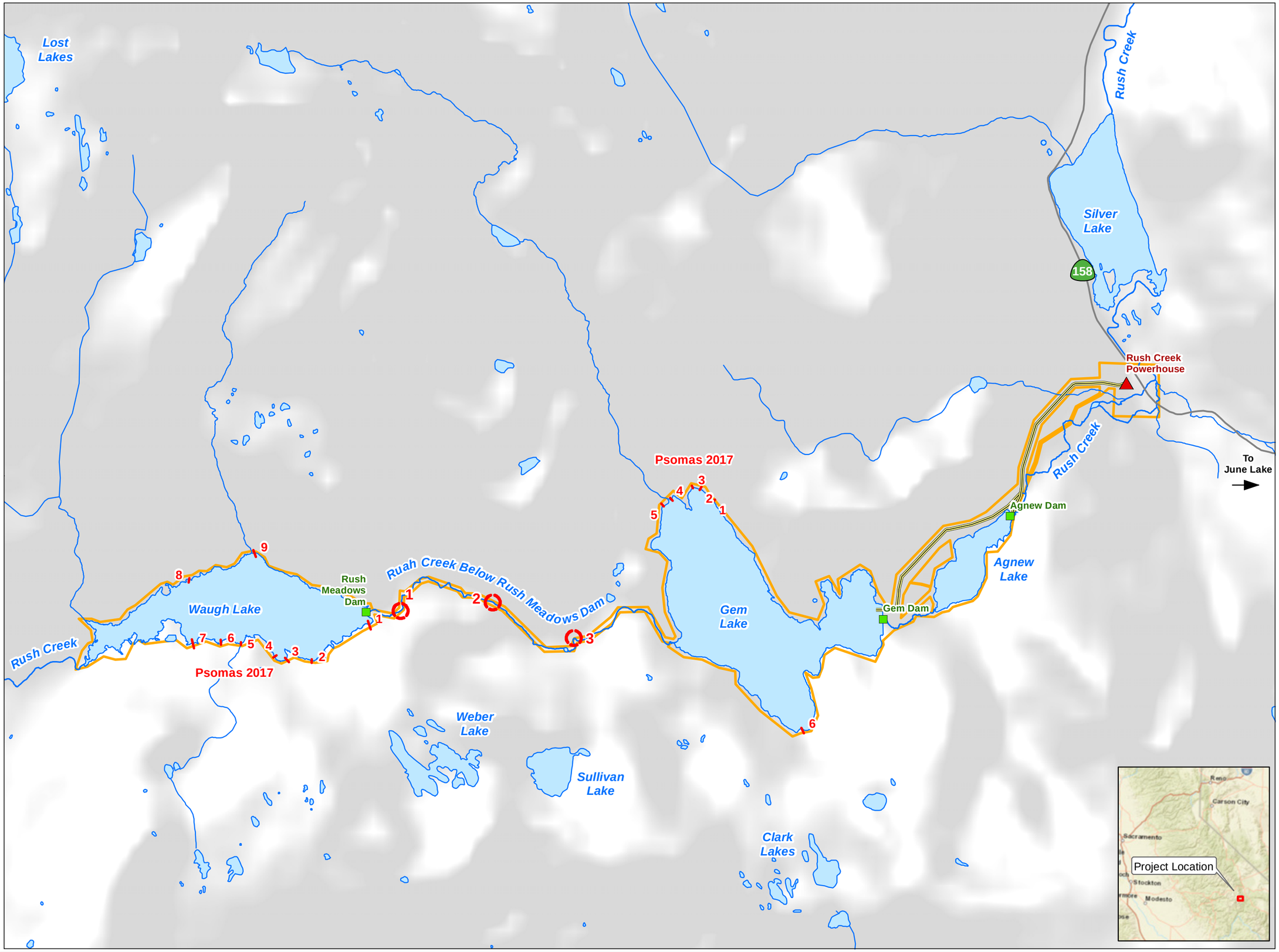
0 250 500 Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 8/18/2021

C:\GIS\Cardno\30735240_SCE_EasternHydro\map\Rush Creek\TerrestrialMaps\SCE_RUSH_CREEK_Floodplains_ProjReaches_LittoralZones_17i11i_01.mxd

This Page Intentionally Left Blank



SCE Facilities

- Dam
- Powerhouse
- Flowline / Penstock
- FERC Boundary

Other Features

- Highway
- River/Stream
- Water Body

Previous Riparian Studies

- Previous Riparian Lake Transects (Psomas, 2017)
- Previous Long-term Riparian Monitoring Sites (Psomas 2000, Psomas 2004, Read 2010, Read and Salamunovich 2019)

SOUTHERN CALIFORNIA EDISON®
An EDISON INTERNATIONAL® Company

Rush Creek Project (FERC 1389)

Map 4.9-2

Previous Riparian Studies Conducted along Rush Creek Project-Affected Reaches and Project Reservoirs

0 0.25 0.5 Miles

Projection: UTM Zone 11
Datum: NAD 83

Date: 8/18/2021

This Page Intentionally Left Blank

TABLE OF CONTENTS

LIST OF TABLES

LIST OF MAPS

LIST OF ACRONYMS

Area Plan	June Lake Area Plan
Caltrans	California Department of Transportation
CDFW	California Department of Fish and Wildlife
CFR	Code of Federal Regulations
FERC	Federal Energy Regulatory Commission
FHWA	Federal Highway Administration
Forest Service	United States Forest Service
General Plan	Mono County General Plan
kV	kilovolt
NPS	National Park Service
PCT	Pacific Crest Trail
Project	Rush Creek Project
SCE	Southern California Edison Company
UNESCO	United Nations Educational, Scientific and Cultural Organization

4.10 LAND USE

This section describes land use in the vicinity of Southern California Edison Company's (SCE) Rush Creek Project (Project). The Federal Energy Regulatory Commission's (FERC) content requirements for this section are specified in Title 18 of the Code of Federal Regulations (CFR) Chapter I § 5.6(d)(3)(viii).

The FERC regulations require the applicant to provide information regarding both land use and recreation. This section focuses on describing land uses and pertinent land management plans and policies that govern land uses within and adjacent to the FERC Project boundary. A description of recreation resources is described in Section 4.11, Recreation Resources.

4.10.1 Information Sources

This section was developed using existing information available in the following primary sources. Additional references are cited in the text, as appropriate.

- FERC Order Issuing New License, Rush Creek Project. FERC Accession No. 19970210-0301 (FERC 1997);
- Land Management Plan for the Inyo National Forest (Forest Service 2019a);
- Wilderness Management Plan for the Ansel Adams, John Muir, and Dinkey Lakes Wildernesses, Inyo and Sierra National Forests (Forest Service 2001);
- Mono County General Plan (Mono County 2015);
- Mono County General Plan, Land Use Element 2020 (Mono County 2020); and
- Mono County June Lake Area Plan, Community Development Element and Plan Safety Element 2010 (Mono County 2010).

4.10.2 Setting

The Project is located on Rush Creek on the eastern slope of the Sierra Nevada in Mono County, California. The Project is situated approximately 4 miles southwest of the unincorporated community of June Lake and approximately 14 miles upstream from Mono Lake. The area around the Rush Creek Powerhouse is located on SCE-owned lands. However, the majority of the Project facilities occupy federal lands within the Inyo National Forest, which is under the jurisdiction of the United States Forest Service (Forest Service). A portion of the Project (Rush Meadows Dam, Waugh Lake, Gem Lake, and the upstream side of Gem Dam) is located within the Ansel Adams Wilderness Area.[1]

[1] Construction of the Project was completed in the early 1900s before Congress' establishment of the Ansel Adams Wilderness Area. Ansel Adams Wilderness Area was originally established by Congress as part of the original Wilderness Act in 1964. At that time, it was designated as the Minarets Wilderness. In 1984, after Ansel Adams' death, the area was renamed in his memory.

Northeast of Agnew Dam, a 135-foot section of the 4 kilovolt (kV) power line, which connects Rush Creek Powerhouse to Agnew Dam, crosses the Owens River Headwaters Wilderness Area,[2] however no poles/towers are located within the wilderness area.

The Yosemite National Park boundary is located approximately 4 miles west of Rush Meadows Dam and encompasses the Yosemite Wilderness Area. The primary Project facilities and land jurisdictions are shown on Map 4.10-1. There are no Project facilities located within Yosemite National Park.

United States Route 395 (US-395) is the primary north-south travel route in the region. State Route 158 (SR-158), also known as the June Lake Loop, intersects US-395 at two locations approximately 6 miles apart. The 16-mile June Lake Loop follows a horseshoe shaped canyon containing four lakes – June, Gull, Silver, and Grant – and the community of June Lake. The June Lake area is popular for both summer and winter recreation. There are several public campgrounds in the area, a small ski resort (June Mountain), and numerous RV parks, motels, and lodges; several cafes and restaurants; grocery and fishing tackle stores; and ski rental shops.

SR-158 provides access to the Rush Creek Powerhouse which is located directly adjacent to SR-158 and south of Silver Lake. The remaining Project facilities are accessible via the Agnew and Gem trams (SCE only) and on foot via the Rush Creek Trail (non-Project, Forest Service trail). Five short Project access trails intersect the Rush Creek Trail (refer to Section 2.0, Project Description).

4.10.3 Land Use and Management within the FERC Project Boundary

The existing FERC Project boundary encompasses a total of approximately 688 acres of land, which is comprised of private land owned by SCE and public lands managed by the Forest Service. Land use within the FERC Project boundary includes hydropower generation and dispersed recreation.

Lands located on private property are subject to the provisions contained in the Mono County General Plan (General Plan) (Mono County 2015) and the June Lake Area Plan (Area Plan) (Mono County 2010), which supplements the General Plan. Public lands under Forest Service jurisdiction are subject to the desired conditions and management direction contained in the Land Management Plan for the Inyo National Forest (Forest Service 2019a). In addition, Project facilities located within the Ansel Adams Wilderness are subject to the Wilderness Management Plan for the Ansel Adams, John Muir, and Dinkey Lakes Wildernesses, Inyo and Sierra National Forests (Forest Service 2001). These management plans are briefly described below.

[2] The Owens River Headwaters Wilderness Area was designated by Congress on March 31, 2009.

4.10.3.1 Mono County General Plan

The purpose of the Mono County General Plan is to establish policies to guide decisions on future growth, development, and conservation of natural resources in the unincorporated area of the county. The General Plan consists of seven elements, including the Land Use Element. The purpose of the Land Use Element is to correlate all land use issues into a set of coherent development policies. The Land Use Element describes the type and intensity of development that can occur on private lands in the unincorporated area of the County. The Land Use Element discusses countywide and community specific constraints, policies, and provides land use designations. The element also contains specific policies for the community planning areas in the county, including the June Lake Community Planning Area (Mono County 2015).

4.10.3.2 June Lake Area Plan

The June Lake Area Plan serves as a comprehensive, integrated and internally consistent guide for policy decisions and development in June Lake. The Area Plan summarizes existing conditions, identifies community issues and potentials, and specific goals, objectives and policies to guide community development over the next 20 years. The Area Plan supplements the county General Plan by providing area-specific directives. The plan identifies five areas that form the foundation of the June Lake Loop Community. The Rush Creek Powerhouse Complex is located within the Silver Lake Meadow Area and is identified as an existing public facility (Mono County 2010).

4.10.3.3 Land Management Plan for the Inyo National Forest

Every national forest managed by the Forest Service is required to have a Land Management Plan that is consistent with the National Forest Management Act of 1976[3] and other laws. The Inyo National Forest is one of 18 national forests in California and encompasses approximately 2 million acres. The Land Management Plan for the Inyo National Forest identifies long-term and overall desired conditions and provides general direction for achieving those desired conditions. The Land Management Plan for the Inyo National Forest includes six components that guide future Project and activity decision-making: desired conditions, objectives, standards, guidelines, suitability of lands, and goals. Area-specific desired conditions and management directions are identified for designated areas, which include wilderness areas (Forest Service 2019a).

4.10.3.4 Ansel Adams Wilderness Plan

A portion of the Project (Rush Meadows Dam, Waugh Lake, Gem Lake, and the upstream side of Gem Dam) is located within the Ansel Adams Wilderness.[1] The Ansel Adams Wilderness Plan provides specific direction that amends and supplements the wilderness management direction in the Land Management Plan for the Inyo National Forest (Forest Service 2001).

[3] 16 U.S.C. 1604 – National Forest System Land and Resource Management Plans

4.10.3.5 Shoreline Buffer Zones

The FERC Project boundary represents a buffer zone around the Project reservoirs. These buffer zones serve two purposes – to ensure public access to Project lands and waters and to help protect the recreation and aesthetic values of the Project reservoirs and their shorelines. All land around the Project reservoirs is public land managed by the Forest Service. Public access to the reservoir shorelines is not restricted by the Forest Service, however access to portions of the reservoirs is limited due to steep terrain.

4.10.3.6 Shoreline Management Plans

There are no permitted public piers, boat docks, landings, bulkheads, or other shoreline facilities associated with any of the Rush Creek Project reservoirs. Therefore, SCE does not maintain a shoreline management plan.

4.10.4 Land Use and Management Adjacent to the FERC Project Boundary

Land use adjacent to the FERC Project boundary includes resource management and natural habitat protection. June Lake, the community nearest to the Project, has land uses of residential, commercial, and commercial lodging (Mono County 2021). Land located adjacent to the FERC Project boundary consists of private land managed by Mono County and public land managed by the Forest Service. Plans that pertain to private land and public land are described above.

4.10.5 Specially-Designated Areas

Several specially-designated management areas are present in the vicinity of the Project. These specially-designated areas are briefly described below.

4.10.5.1 National Wild and Scenic Rivers

The National Wild and Scenic Rivers System was created by Congress in 1968 to preserve certain rivers with outstanding natural, cultural, and recreational values in a free-flowing condition for the enjoyment of present and future generations. The Wild and Scenic Rivers Act,[4] which established the system, is notable for safeguarding the special character of these rivers, while recognizing the potential for their appropriate use and development.

Rush Creek and its tributaries are not designated by Congress as Wild and Scenic Rivers in the Wild and Scenic Rivers System. There are no officially designated rivers within the Rush Creek Watershed (NPS 2021).

However, a river inventory was conducted as part of revising the Inyo National Forest Land Management Plan (Forest Service 2019a) that recognized the inclusion of multiple segments of Rush Creek and Crest Creek (tributary to Rush Creek) for Wild and Scenic River eligibility. While the Land Management Plan does not *designate* these river

[4] Public Law 90-542; 16 U.S.C. 1271 et seq.

segments as part of the National Wild and Scenic Rivers System, it recognizes them as eligible for future designation due to their outstanding natural, cultural, or recreational values. Wild and Scenic River eligibility affects future management decisions on the Inyo and it opens the possibility for future designation by Congress (Forest Service 2019b). In accordance with the 2012 Planning Rule[5], the Forest Service manages the eligible river segments to protect the values that support their inclusion in the National Wild and Scenic Rivers System until Congress makes a final determination on their designation.

Refer to Table 4.10-1 for information related to the river segments determined to be eligible for inclusion in the National Wild and Scenic Rivers System and Map 4.10-2 for a depiction of their location.

4.10.5.2 State Protected River Segments

There are no segments of Rush Creek that are designated as sensitive aquatic communities, or otherwise have special designation (CDFW 2021). In addition, none of the rivers in the Watershed are included in the California Wild and Scenic River System (State of California 2021).

4.10.5.3 National Trail System

The National Trails System is the network of scenic, historic, and recreation trails created by the National Trails System Act of 1968 (as amended). The nearest national trail to the Project is the Pacific Crest Trail (PCT), which traverses the crest of the Sierra Nevada crossing through Yosemite National Park, west of the Project. At its closest point, the PCT is located approximately 1.2 miles southwest of Rush Meadows Dam (Map 4.10-3).[6] With a few exceptions, the PCT is one continuous trail that extends more than 2,650 miles from Mexico to Canada (Forest Service 2021).

4.10.5.4 National Parks

The Yosemite National Park boundary is located approximately 4 miles west of Rush Meadows Dam (Map 4.10-3). Designated by Congress in 1890, Yosemite covers an area of 747,956 acres along the central western slope of the Sierra Nevada in east-central California. Designated a United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage Site in 1984, Yosemite is internationally recognized for its spectacular granite cliffs, waterfalls, clear streams, giant sequoia groves, and biological diversity. More than 94% of the park is designated wilderness and 135 miles of the Tuolumne and Merced Rivers have been designated as part of the National Wild and Scenic Rivers System. Yosemite contains one of the largest and least fragmented habitat blocks in the Sierra Nevada, and the park supports a diversity of plants and animals. Park elevations range from approximately 2,000 feet to more than 13,000 feet and support five major vegetation zones: chaparral/oak woodland, lower montane forest, upper montane forest, subalpine zone, and alpine (NPS 2016).

[5] 36 CFR 219.7(c)(2)(vi)

[6] Refer to Map 4.11-2 for other trails in the vicinity of the Project.

4.10.5.5 National Forests and Scenic Areas

Inyo National Forest

The majority of the Project occupies federal lands within the Inyo National Forest (Map 4.10-3). The Inyo National Forest was established in 1907 for the purposes of protecting lands needed to build the Los Angeles Aqueduct. The Inyo includes 2 million acres that cover parts of the eastern Sierra Nevada of California and the White Mountains of California and Nevada, and spans portions of Fresno, Inyo, Madera, Mono, and Tulare counties of California, and Esmeralda and Mineral counties of western Nevada. The Inyo National Forest has diverse ecosystems including portions of the Great Basin, Mojave Desert, and Sierra Nevada bioregions. Elevations range from 3,800 feet in Owens Valley to 14,495 feet at the peak of Mount Whitney, the highest point in the contiguous United States. Mono Lake is within a designated national scenic area on the Inyo, and its waters cover approximately 37,000 acres (Forest Service 2019a).

Sierra National Forest

The Sierra National Forest is located south of the Project (Map 4.10-3). The Sierra National Forest is located on the western slope of the central Sierra Nevada mountain range, covering approximately 1.3 million acres within eastern portions of Mariposa, Madera and Fresno Counties. Elevations vary from 900 feet at Pine Flat Reservoir, to nearly 14,000 feet at the summit of Mount Humphreys along the Sierra Crest. The combination of extreme elevation changes with the variability in aspect and slope, variety of geology and soils, and the amount and timing of precipitation creates a high diversity of ecosystems, ranging from grasslands to subalpine meadows (Forest Service 2019c).

Mono Basin National Forest Scenic Area

The Mono Basin National Forest Scenic Area is located within the Inyo National Forest and downstream of the Project (Map 4.10-3). In 1984, Congress designated the Mono Basin National Forest Scenic Area within the California Wilderness Act to protect the geologic, ecologic, and cultural resources within the 116,274-acre scenic area surrounding Mono Lake. The legislation also specified that management would provide for recreation use and interpretative facilities (such as trails and campgrounds), permit full use for scientific study or research, and other measures. A comprehensive Mono Basin Scenic Management Plan was completed in 1989 and includes specific management guidance, zoned management mapping of the scenic area, and other management direction (Forest Service 2019a).

4.10.5.6 Wilderness Areas

Ansel Adams Wilderness

A portion of the Project (Rush Meadows Dam, Waugh Lake, Gem Lake, and the upstream side of Gem Dam) is located within the Ansel Adams Wilderness Area[1] (Map 4.10-3). Originally established as the Minarets Wilderness in 1964 and enlarged by 119,000 acres and renamed in 1984 by the California Wilderness Act, the Ansel Adams Wilderness is

administered by the Inyo and Sierra National Forests. There are 78,775 acres administered by the Inyo National Forest. The Ansel Adams Wilderness extends from State Route 120 (SR-120) in the north to Lake Thomas Edison to the south. The Ansel Adams Wilderness is contiguous with Yosemite National Park to its north, and the John Muir Wilderness to its south. Elevations range from 3,500 feet along its western boundary to 13,157 feet at the summit of Mt. Ritter. The wide range of elevations and location on both the east and west sides of the Sierra Nevada contribute to the tremendous ecosystem diversity in this wilderness. The higher elevations along the Sierra Crest are in glaciated terrain that is dotted with lakes and alpine meadows, and the Ritter Range contains several active glaciers. From the Ritter Range, the North and Middle Forks of the San Joaquin River combine to form the San Joaquin River, which has carved a deep canyon through the southwest portion of the wilderness (Wilderness Connect 2021a).

Owens River Headwaters Wilderness

Northeast of Agnew Dam, a 135-foot section of the 4-kV power line, which connects Rush Creek Powerhouse to Agnew Dam, crosses the Owens River Headwaters Wilderness Area, however no poles/towers are located within the wilderness area. The Owens River Headwaters Wilderness is located east of the Project (Map 4.10-3). The Owens River Headwaters Wilderness was established as part of the Omnibus Public Lands Management Act on March 31, 2009. This 14,721 acre wilderness protects the headwaters of the Owens River, an area of forested mountains and alpine meadows on the east side of the crest of the Sierra Nevada Mountains between June Lake and Mammoth Lakes, California. This area contains exceptionally diverse landforms and habitat including the expansive subalpine Glass Creek Meadow, and the region’s largest old growth red fir forest. The San Joaquin Ridge forms the western boundary of the wilderness, which is contiguous with the Ansel Adams Wilderness. The relatively low elevation ridge allows moisture from Pacific storms to carry over the mountains. The abundant moisture has created an island of wet meadows and forested ridges on the dry side of the Sierra Nevada (Wilderness Connect 2021b).

Yosemite Wilderness

The Yosemite Wilderness is encompassed within Yosemite National Park which is described in Section 4.10.5.4. There are no Project facilities located within Yosemite Wilderness Area.

4.10.5.7 Scenic Highways and Byways

The National Scenic Byways Program was established by Congress in 1991, and recognizes historic, scenic, and culturally important roads. The program is administered through the Federal Highway Administration (FHWA). In order to apply for a National Scenic Byway designation, a road must first be distinguished as a state scenic byway (FHWA 2021).

California's Scenic Highway Program was created by the state legislature in 1963 and is managed by the Department of Transportation (Caltrans). Its purpose is to protect and enhance the natural scenic beauty of California highways and adjacent corridors, through special conservation treatment (Caltrans 2021).

Six road segments in the vicinity of the Project are either officially designated or eligible for inclusion in the National Scenic Byways Program or the California Scenic Highway Program, including portions of SR-120, SR-158, and US-395. Table 4.10-2 provides a description, begin and end points, and official designation and Map 4.10-4 depicts their location.

4.10.6 References

Caltrans (California Department of Transportation). 2021. State Scenic Highway Program. Available at: https://dot.ca.gov/programs/design/lap-landscape-architecture-and-community-livability/lap-liv-i-scenic-highways.

CDFW (California Department of Fish and Wildlife. 2021. California Natural Diversity Database (CNDDB). Version dated: April 2, 2021. Available at: https://wildlife.ca.gov/Data/CNDDB/Maps-and-Data.

FERC (Federal Energy Regulatory Commission). 1997. Order Issuing New License, Rush Creek Project. FERC Accession No. 19970210-0301. 78 FERC ¶ 61,109. February.

FHWA (Federal Highway Administration). 2021. National Scenic Byways Program. Available at: https://www.fhwa.dot.gov/byways/byways/2302.

Forest Service (United States Forest Service). 2001. Ansel Adams, John Muir, and Dinkey Lakes Wilderness Management Plans. Available at: https://www.fs.usda.gov/detailfull/inyo/landmanagement/planning/?cid=FSBDEV3_003888&width=full.

———. 2019a. Land and Resources Management Plan for the Inyo National Forest. Available at: https://www.fs.usda.gov/main/inyo/landmanagement/planning.

———. 2019b. Final Environmental Impact Statement for Revision of the Inyo National Forest Land Management Plan. Volume 2 – Appendix C: Wild and Scenic Rivers Evaluation for the Inyo National Forest. September.

———. 2019c. Revised Draft Land Management Plan for the Sierra National Forest Fresno, Madera, and Mariposa Counties, California. Available at: https://www.fs.usda.gov/nfs/11558/www/nepa/3403_FSPLT3_4658767.pdf.

———. 2021. Pacific Crest National Scenic Trail. Available at: https://www.fs.usda.gov/pct.

Mono County. 2010. June Lake Area Plan. Community Development Element. Plan Safety Element. Available at: https://monocounty.ca.gov/planning/page/june-lake-area-plan.

———. 2015. Mono County General Plan Update. Available at: https://monocounty.ca.gov/planning/page/general-plan.

———. 2020. Mono County General Plan. Land Use Element. Available at: https://monocounty.ca.gov/sites/default/files/fileattachments/planning_division/page/9617/2020_land_use_element_final_1-9-20.pdf.

———. 2021. Mono County Parcel Land Use Designation Application. Available at: https://gis.mono.ca.gov/apps/pv/.

NPS (National Park Service). 2016. Foundation Document, Yosemite National Park, California. December.

———. 2021. Nationwide Rivers Inventory. Available at: https://www.nps.gov/subjects/rivers/nationwide-rivers-inventory.htm.

State of California. 2021. Public Resources Code, Division 5, Parks and Monuments [5001-5873]. Chapter 1.4, California Wild and Scenic Rivers Act [5093.50-5093.71].

Wilderness Connect. 2021a. Description of the Ansel Adams Wilderness. Available at: https://wilderness.net/visit-wilderness/?ID=12.

———. 2021b. Description of the Owens River Headwaters Wilderness. Available at: https://wilderness.net/visit-wilderness/?ID=735.

This Page Intentionally Left Blank

TABLES

This Page Intentionally Left Blank

Table 4.10-1. Inyo National Forest River Segments Determined to be Eligible for Inclusion in the National Wild and Scenic Rivers System

River Name	Segment ID No.(s)	Length (miles)	Preliminary Classification	Beginning Point	End Point	Outstandingly Remarkable Values
Crest Creek	1.031.1	3.3	Wild	Headwaters	Inlet to Gem Lake	History
Rush Creek	1.165.1	3.7	Wild	Headwaters	Inlet of Waugh Lake	Scenery, Recreation, Wildlife Populations
Rush Creek	1.165.2	1.9	Wild	Outlet of Waugh Lake below dam	Inlet to Gem Lake	Scenery, Recreation, History, Prehistory
Rush Creek	1.165.8	0.3	Recreational	Outlet of Gem Lake below dam	Inlet to Agnew Lake	History
Rush Creek	1.165.4	0.1	Recreational	Small dam structure 600 feet below Agnew Lake dam	Owens River Headwaters Wilderness boundary	History
Rush Creek	1.165.7	0.2	Wild	Owens River Headwaters Wilderness boundary	Owens River Headwaters Wilderness boundary	History
Rush Creek	1.165.6	0.7	Recreational	Owens River Headwaters Wilderness boundary	Confluence with Reversed Creek	History

Source: Forest Service 2019a and 2019b

Table 4.10-2. Scenic Highways and Byways in the Vicinity of the Project

Highway	Description	Post Mile Begin	Post Mile End	Designation
National Scenic Byways Program				
120	From eastern boundary of Yosemite (Tioga Pass) to Big Oak Flat	13.4	77.4	Federal Byway (September 19,1996)
State Scenic Highway Program				
120	From Route 395 south of Lee Vining to eastern boundary of Yosemite (Tioga Pass)	0.0	13.4	Eligible
158	From Route 395 near June Lake to Route 395 south of Lee Vining	0.0	15.8	Eligible
395	From 1.1 mile north of Route 203 to Route 120	26.9	50.7	Officially Designated (June 5, 2000)
395	From Route 120 to north of Lee Vining[1]	50.7	52	Eligible
395	From north of Lee Vining to Evans Tract (south of Bridgeport)	52	74.5	Officially Designated (June 5, 2000)

Source: FHWA 2021; Caltrans 2021

[1] Eligible segment through the town of Lee Vining is part of a larger segment of 395 extending from post mile 29.7 (Route 14) to post mile 117 (near Coleville).

MAPS

This Page Intentionally Left Blank

HOOVER WILDERNESS
Lee Vining
Mono Lake
120
Rush Creek
Tuolumne County
Mono County
158
Grant Lake
395
YOSEMITE WILDERNESS
ANSEL ADAMS WILDERNESS
YOSEMITE NATIONAL PARK
INYO NATIONAL FOREST
Alger Lakes
June Lake
Lost Lakes
Silver Lake
Gull Lake
June Lake
Rush Creek Powerhouse
Reversed Creek
Gem Lake
Agnew Lake
Agnew Dam
Waugh Lake
Rush Creek
Marie Lakes
Rush Meadows Dam
Gem Dam
Rush Creek Project
To Bishop
Thousand Island Lake
Davis Lakes
Madera County
OWENS RIVER HEADWATERS WILDERNESS
SIERRA NATIONAL FOREST

SCE Facilities
- Dam
- Powerhouse
- Flowline / Penstock
- FERC Boundary

Other Features
- Major City/Town
- Highway
- River/Stream
- Lake
- County Boundary

Land Jurisdiction and National Wilderness Areas/Parks*
- Local Government
- LADWP
- State Government
- Bureau of Land Management
- U.S. Forest Service
- Ansel Adams Wilderness (U.S. Forest Service)
- Hoover Wilderness (U.S. Forest Service)
- Owens River Headwaters Wilderness (U.S. Forest Service)
- Yosemite National Park / Yosemite Wilderness (National Park Service)
- Private (Blank)

*SOURCES: BLM, 2020.
Mono Co., 2019.
Wilderness.net, 2019.

SOUTHERN CALIFORNIA EDISON®
An EDISON INTERNATIONAL® Company

Rush Creek Project (FERC 1389)

Map 4.10-1

Land Jurisdictions

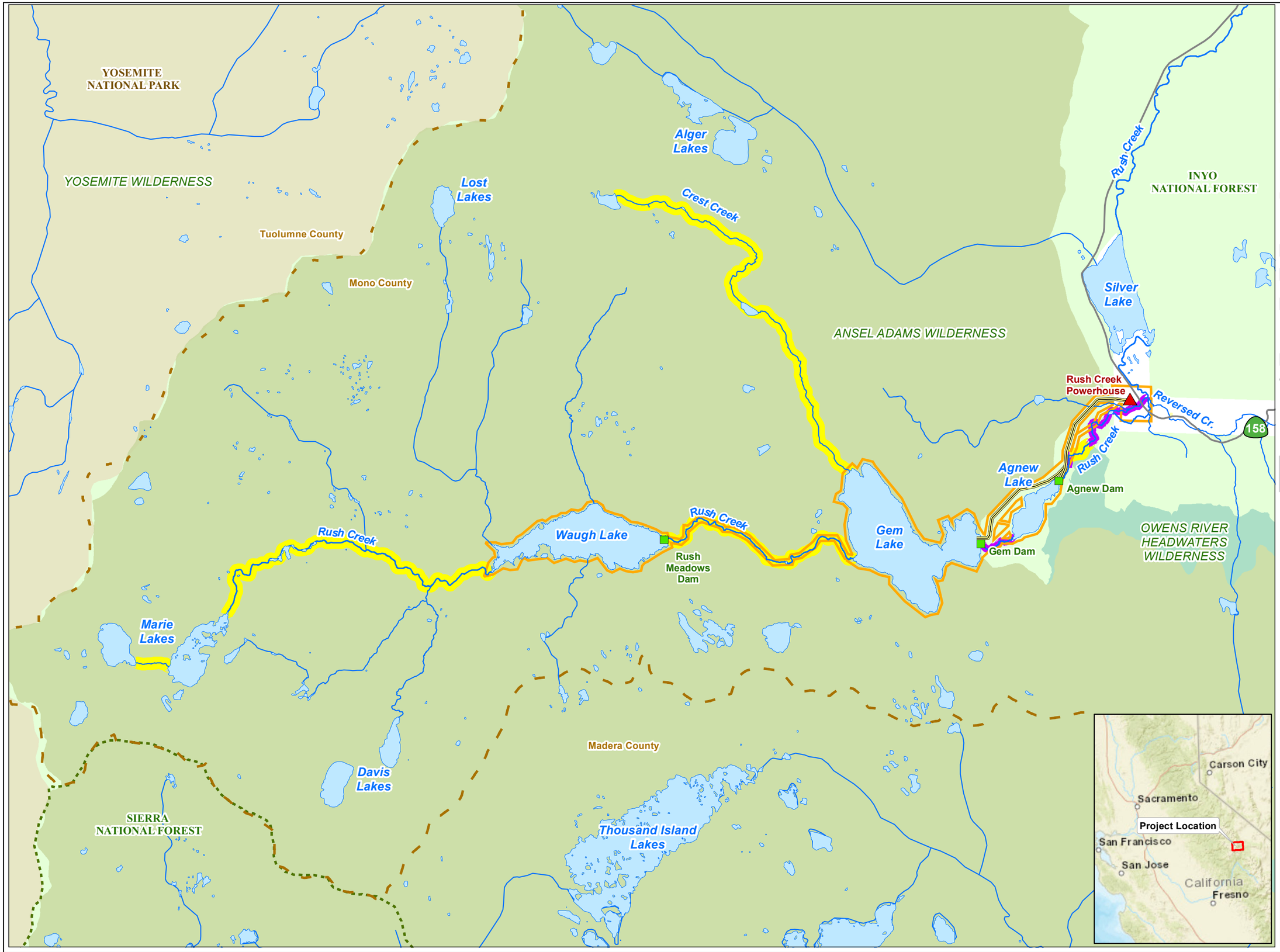
0 0.5 1 2 Miles

Projection: UTM Zone 11
Datum: NAD 83

Date: 7/12/2021

C:\GIS\Cardno\30735240_SCE_EasternHydro\map\Rush Creek\SCE_RUSH_CREEK_Juris_Vicinity_17i11i_01.mxd

This Page Intentionally Left Blank



SCE Facilities

- Dam
- Powerhouse
- Flowline / Penstock
- FERC Boundary

Other Features

- Highway
- River/Stream
- Lake
- County Boundary

Land Jurisdiction and National Wilderness Areas/Parks*

- U.S. Forest Service
- Ansel Adams Wilderness (U.S. Forest Service)
- Owens River Headwaters Wilderness (U.S. Forest Service)
- Yosemite National Park / Yosemite Wilderness (National Park Service)
- Private (Blank)

*SOURCES: BLM, 2020.
Mono Co., 2019.
Wilderness.net, 2019.

National Wild and Scenic River System Eligible Segments

- Wild
- Recreational

SOUTHERN CALIFORNIA EDISON®
An *EDISON INTERNATIONAL*® Company

Eastern Hydro Generation

Map 4.10-2

River Segments Determined to be Eligible for the National Wild and Scenic River System

0 0.25 0.5 Miles

Projection: UTM Zone 11
Datum: NAD 83

Date: 7/12/2021

C:\GIS\Cardno\30735240_SCE_EasternHydro\map\Rush Creek\LandMaps\SCE_RUSH_CREEK_NWSRS_Eligible_17i11i_01.mxd

This Page Intentionally Left Blank

HOOVER WILDERNESS
Lee Vining
Mono Lake
120
Rush Creek
MONO BASIN NATIONAL FOREST SCENIC AREA
Tuolumne County
Mono County
Grant Lake
395
Pacific Crest Trail
ANSEL ADAMS WILDERNESS
INYO NATIONAL FOREST
YOSEMITE WILDERNESS
YOSEMITE NATIONAL PARK
Alger Lakes
158
June Lake
Lost Lakes
Silver Lake
Gull Lake
June Lake
Rush Creek Powerhouse
Waugh Lake
Gem Lake
Agnew Lake
Agnew Dam
Rush Creek
Rush Meadows Dam
Gem Dam
Marie Lakes
Rush Creek Project
To Bishop
Davis Lakes
Thousand Island Lake
Madera County
OWENS RIVER HEADWATERS WILDERNESS
SIERRA NATIONAL FOREST
Carson City
Sacramento
Project Location
San Francisco
San Jose
California
Fresno

SCE Facilities

- Dam
- Powerhouse
- Flowline / Penstock
- FERC Boundary

Other Features

- Major City/Town
- Highway
- River/Stream
- Lake
- County Boundary

Land Jurisdiction and National Wilderness Areas/Parks*

- Local Government
- LADWP
- State Government
- Bureau of Land Management
- U.S. Forest Service
- Ansel Adams Wilderness (U.S. Forest Service)
- Owens River Headwaters Wilderness (U.S. Forest Service)
- Yosemite National Park / Yosemite Wilderness (National Park Service)
- Private (Blank)

*SOURCES: BLM, 2020.
Mono Co., 2019.
Wilderness.net, 2019.

Other Recreational Areas and Trails

- Pacific Crest Trail
- Mono Basin Natl. Forest Scenic Area

SOUTHERN CALIFORNIA EDISON®
An EDISON INTERNATIONAL® Company

Rush Creek Project (FERC 1389)

Map 4.10-3

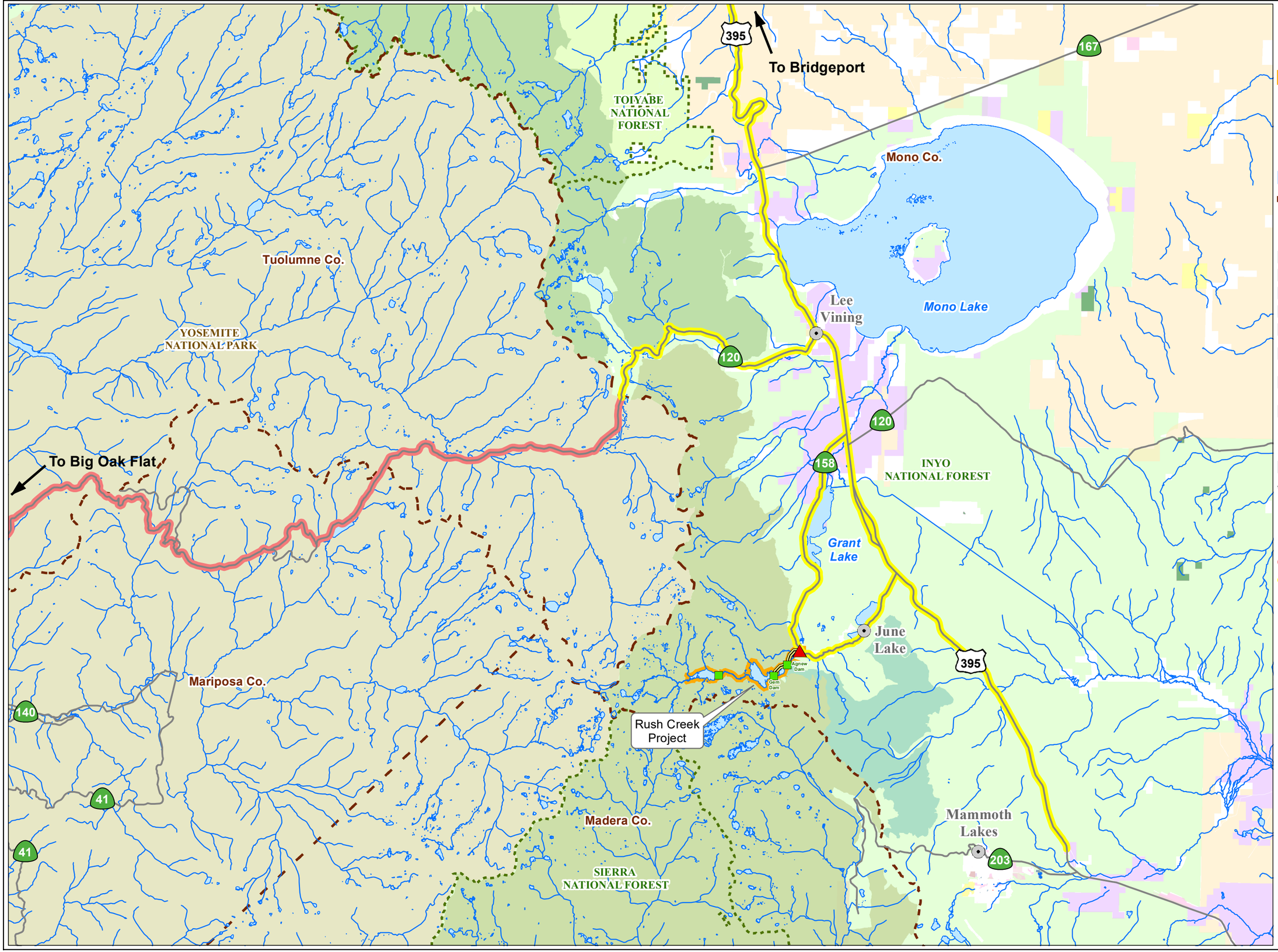
Regionally and Nationally Important Recreation Areas and Trails

0 0.5 1 2 Miles

Projection: UTM Zone 11
Datum: NAD 83

Date: 7/12/2021

This Page Intentionally Left Blank



SCE Facilities

- Dam
- Powerhouse
- FERC Boundary

Other Features

- Major City/Town
- Highway
- River/Stream
- Lake
- County Boundary

Land Jurisdiction and National Wilderness Areas/Parks*

- Local Government
- LADWP
- State Government
- Bureau of Land Management
- U.S. Forest Service
- Ansel Adams Wilderness (U.S. Forest Service)
- Hoover Wilderness (U.S. Forest Service)
- Owens River Headwaters Wilderness (U.S. Forest Service)
- Yosemite National Park / Yosemite Wilderness (National Park Service)
- Private (Blank)

*SOURCES: BLM, 2020.
Mono Co., 2019.
Wilderness.net, 2019.

Scenic Highways and Byways

- National Scenic Byways Program
- State Scenic Highway Program

SOUTHERN CALIFORNIA EDISON®
An *EDISON INTERNATIONAL*® Company

Rush Creek Project (FERC 1389)

Map 4.10-4

Scenic Highways and Byways

0 2.5 5 Miles

Date: 7/12/2021

Projection: UTM Zone 11
Datum: NAD 83

C:\GIS\Cardno\30735240_SCE_EasternHydro\map\Rush Creek\LandMaps\SCE_RUSH_CREEK_Scenic_Hwys_Bwys_17i11i_04.mxd

This Page Intentionally Left Blank

TABLE OF CONTENTS

LIST OF TABLES

LIST OF MAPS

LIST OF ACRONYMS

CDFW	California Department of Fish and Wildlife
EIS	Environmental Impact Statement
FERC	Federal Energy Regulatory Commission
Forest Service	United States Forest Service
INF	Inyo National Forest
JMT	John Muir Trail
MLTPA	Mammoth Lake Trails Public Access
PCT	Pacific Crest Trail
Project	Rush Creek Project

RMA	Recreation Management Area
ROS	Recreation Opportunity Spectrum
RV	Recreational Vehicle
SCE	Southern California Edison Company
SCORP	Statewide Comprehensive Outdoor Recreation Plan
SR	State Route
US	United States

4.11 RECREATION RESOURCES

This section describes the recreational resources in the vicinity of Southern California Edison Company's (SCE) Rush Creek Project (Project). The Federal Energy Regulatory Commission's (FERC) content requirements for this section are specified in Title 18 of the Code of Federal Regulations Chapter I § 5.6(d)(3)(viii).

The FERC regulations require the applicant to provide information regarding both recreation and land use. This section provides an overview of the recreation setting and the United States Forest Service's (Forest Service) Recreation Opportunity Spectrum; general information about the developed and dispersed recreation resources and opportunities in the vicinity of the Project (within and around the Project boundary); specific information about existing recreation facilities in the Rush Creek drainage; and summarizes current and future recreation needs identified in existing management plans. Non-recreation land use within and adjacent to the FERC Project boundary is discussed separately in Section 4.10, Land Use.

4.11.1 Information Sources

This section was developed using existing information available in the following primary documents. Additional references are cited in the text, as appropriate.

- Land Management Plan for the Inyo National Forest (Forest Service 2019a);
- Final Environmental Impact Statement (EIS) for Revision of the Inyo National Forest Land Management Plan, Volume 1 (Forest Service 2019b);
- Wilderness Management Plan for the Ansel Adams, John Muir, and Dinkey Lakes Wildernesses, Inyo and Sierra National Forests (Forest Service 2001a);
- Management Direction for the Ansel Adams, John Muir and Dinkey Lakes Wildernesses. Final EIS and EIS Appendices: Appendix C, Trails Inventory; Appendix I, Wilderness Use Data; Appendix L, Quota Rationale (Forest Service 2001b); and
- Inyo National Forest web site, recreation web page available at: https://www.fs.usda.gov/recmain/inyo/recreation.

4.11.2 Setting

The Project is located on Rush Creek[1] on the eastern slope of the Sierra Nevada in Mono County, California. The Project is situated approximately 4 miles southwest of the unincorporated community of June Lake and approximately 14 miles upstream from Mono Lake. The majority of the Project facilities occupy federal lands within the Inyo National

[1] Rush Creek and its tributaries are not designated by Congress as Wild and Scenic Rivers in the Wild and Scenic Rivers System, however, several segments were determined eligible by the Forest Service (refer to Section 4.10, Land Use).

Forest (INF), which is under the jurisdiction of the Forest Service. A portion of the Project (Rush Meadows Dam, Waugh Lake, Gem Lake, and the upstream side of Gem Dam) is located within the Ansel Adams Wilderness Area.[2,3] In addition, the Owens River Headwaters Wilderness Area[4] is located east of Agnew Lake. The headwaters of Rush Creek begin at the crest of the Sierra and the creek flows east and down through the canyon from Waugh Lake, to Gem Lake, to Agnew Lake, and eventually into and through Silver Lake (non-project), Grant Lake (non-project), and finally into Mono Lake.

United States Route 395 (US-395) is the primary north-south travel route in the region. State Route 158 (SR-158), also known as the June Lake Loop, intersects US-395 at two locations approximately 6 miles apart.[5] The 16-mile June Lake Loop follows a horseshoe shaped canyon containing four lakes – June, Gull, Silver, and Grant – and the community of June Lake. During the winter season SR-158 is closed between the northern junction of SR-158/US-395 to the powerhouse, but remains open from the SR-158/US-395 southern junction to the powerhouse. The June Lake area is popular for both summer and winter recreation. There are several public campgrounds in the area, a small ski resort (June Mountain), and numerous Recreational Vehicle (RV) parks, motels, and lodges; several cafes and restaurants; grocery and fishing tackle stores; and ski rental shops.

SR-158 provides access to the Rush Creek Powerhouse which is located directly adjacent to SR-158 and south of Silver Lake. The remaining Project facilities are accessible via the Agnew and Gem trams (Project personnel only) and on foot via the Rush Creek Trail (non-Project, Forest Service trail – open to the general public). Five short Project access trails intersect the Rush Creek Trail (refer to Section 2.0, Project Description). Several other Forest Service trails intersect the Rush Creek Trail and these are described in Section 4.11.4.

The primary Project facilities and land jurisdictions are described in Section 4.10, Land Use and shown on Map 4.10-1. Refer to Section 2.0, Maps 2-1 through 2-4 for detailed maps depicting the FERC Project boundary and major Project facilities.

4.11.2.1 Forest Service Recreation Opportunity Spectrum

The Forest Service uses the Recreation Opportunity Spectrum (ROS) to classify lands on the INF. The ROS is a combination of physical, biological, social, and managerial conditions that give value to a place. The ROS includes six classes: primitive, semi-primitive non-motorized, semi-primitive motorized, roaded natural, rural, and urban. The Forest Service classifies the land within and around the FERC Project boundary above Gem Dam as “primitive,” a recreation class that indicates a physical setting that is remote, predominately unmodified, and naturally evolving with a very high probability of solitude

[2] Construction of the Project was completed in the early 1900s before Congress’ establishment of the Ansel Adams Wilderness Area. Ansel Adams Wilderness Area was originally established by Congress as part of the original Wilderness Act in 1964. At that time, it was designated as the Minarets Wilderness. In 1984, after Ansel Adams’ death, the area was renamed in his memory.

[3] Recreation use in wilderness areas requires a wilderness permit from the Forest Service (refer to Section 4.11.4).

[4] The Owens River Headwaters Wilderness Area was designated by Congress on March 31, 2009.

[5] SR-158 is designated as eligible for inclusion on the State Scenic Highway Program (refer to Section 4.10, Land Use).

and little evidence of people. The Forest Service classifies the land within and around the FERC Project boundary below Gem Dam as “semi-primitive non-motorized,” implying a natural setting with some rustic improvements. The Forest Service classifies land along the SR-158 corridor, inclusive of INF land around the Rush Creek Powerhouse, as “rural,” indicating a physically altered landscape with naturally appearing backdrops (Forest Service 2019a). Map 4.11-1 displays the ROS classifications the Forest Service assigns to lands within and around the FERC Project boundary.

4.11.3 Existing Developed Recreation Facilities within the FERC Project Boundary

The Project does not include any developed recreation facilities.

4.11.4 Existing Developed Recreation Facilities in the Vicinity of the Project

The nearest developed non-Project recreation facilities (e.g., campgrounds, day-use areas, boat ramps, etc.) to the Project are located at Silver Lake (located approximately 0.5 mile downstream of Rush Creek Powerhouse). Additional non-Project facilities are located along the June Lake Loop (SR-158) at June, Gull, and Grant lakes. Two primitive camps are located in the vicinity of the Project: one is 0.20 mile west of Gem Lake (referred to as Billy Lake Stock Camp), and the second is 0.25 mile northeast of Rush Meadows Dam (referred to as Frontier Pack Station Camp). Both were established and are operated by Frontier Pack Station under a Forest Service Special Use Permit. A list of developed recreation facilities that are located within vicinity of the Project is provided in Table 4.11-1, organized by jurisdiction and type of facility. The locations of the facilities that are identified on Table 4.11-1 are shown on Map 4.11-2.

In addition, the Forest Service maintains several trails in the vicinity of the Project. The Rush Creek Trail (Forest Service Trail Code AA05) is the primary trail that provides public access to Project reservoirs and the INF backcountry, and is also a popular trailhead for users seeking access to the Pacific Crest Trail (PCT) and John Muir Trail (JMT). Rock climbers headed to routes in the Minarets or on and around Banner Peak and Mt. Ritter, may also use the trailhead, though the trailheads near Devils Postpile National Monument (further south) provide more direct access to these areas.

The Rush Creek Trailhead is located in a paved parking area at the northern end of Silver Lake on the west side of SR-158 approximately 1.25 miles north of the Rush Creek Powerhouse complex. From the trailhead, the Rush Creek Trail extends south and parallel to SR-158, before turning west and generally climbing along the northern shores of Agnew, Gem, and Waugh lakes. The Rush Creek Trail terminates at its junction with the JMT (a portion of the PCT) approximately 9.1 trail miles from the Rush Creek Trail trailhead. Side trails extend from the Rush Creek Trail toward other wilderness destinations including Alger Lakes and Parker Pass, which head north toward Tuolumne Meadows and Yosemite National Park, Clark Lakes and Agnew Pass, and to Spooky Meadow which head south toward Mammoth Mountain and Devils Post Pile National Monument (Forest Service 2021a).

The Rush Creek Trail crosses the Agnew Tram (Project facility) at several locations. Signage at these locations requests travelers stay on the trail and off the tracks. In addition, Project access trails diverge from the Rush Creek Trail to provide access to Project facilities for operation and maintenance activities. These trails, while on public lands, are not part of the Forest Service's trail system. Refer to Section 2.0, Project Description for information on Project access trails.

A wilderness permit is required year-round for overnight trips into John Muir, Ansel Adams, Golden Trout, Hoover Wilderness, and the wilderness portions of Yosemite, Sequoia and Kings Canyon National Parks. Between May 1 and November 1 of each year, use of these wilderness areas is regulated by a limited entry quota of wilderness permits per day per trailhead. The non-commercial wilderness permit quota for the Rush Creek Trail is 30 persons per day meaning that up to 30 people may start an overnight trip from the Rush Creek Trailhead each day. In addition to this 30-person non-commercial quota, the Forest Service reserves a commercial quota of 15 persons per day. Frontier Pack Station uses the Rush Creek Trail as its primary access to the wilderness for commercial trips. The non-quota season is November 2 through April 30. No wilderness permit is required for day hikes (Forest Service 2021b).

4.11.5 Recreation Opportunities and Use in the Vicinity of the Project

As discussed above, the Project does not include any developed recreation facilities that would support recreation use. However, dispersed recreation use, including camping and fishing, does occur at Project reservoirs and along Rush Creek within the FERC Project boundary. The Rush Creek Trail is a major access route to the Ansel Adams Wilderness, Yosemite National Park, JMT and PCT. Agnew, Gem and Waugh lakes, and the surrounding area offer excellent opportunities for dispersed outdoor recreation. Summer/warm seasons activities include hiking, trail running, backpacking, fishing, swimming and horseback-riding. During the winter (snow season) recreational activities in the vicinity of the Project include ski touring, ice skating and ice-climbing. In addition, SR-158 (i.e., the June Lake Loop) is heavily used for sightseeing by vehicle (Mono County 2015). The following sections summarize recreation opportunities and use in the vicinity of the Project.

4.11.5.1 Hiking, Backpacking, and Trail Running

Day hiking and backpacking are traditional popular activities in the vicinity of the Project, and the Forest Service in 2001 described the level of overnight use for the Rush Creek drainage as "high" for both commercial and non-commercial use based on data from the late 1990s (Forest Service 2001b). Between the years 1996 and 2000 overnight visits by people who toured into the backcountry from the Rush Creek Trailhead averaged 1,733 people per year. During that same time period, the overnight wilderness permit quota was reached six times. (Forest Service 2001b). In a summary of the Rush Creek Trail, used in part as rationale for the current wilderness permit quota (30 people per day), the Forest Service notes that overnight users starting from the Rush Creek Trailhead stay one to two nights in the Rush Creek drainage, and one to two nights in the San Joaquin drainage (location of Thousand Island Lake). Overnight use in the Rush Creek drainage

also comes from the west (Yosemite National Park) over Donahue Pass on the JMT/ PCT (Forest Service 2001b).

In addition to these overnight visits, many day trips are taken into the drainage as well, including trips taken by trail runners. In the Final EIS for management of the Ansel Adams, John Muir and Dinkey Lakes Wildernesses, the Forest Service notes a general increase in day-use between 1990 and 2000. Though day-use permits are not required for access from the Rush Creek Trailhead the Forest Service referenced day-use permits for hiking Mt. Whitney as an indicator of an increasing trend of day-use backcountry access. Forest Service data shows that the number of people who hiked Mt. Whitney with a day-use permit nearly doubled between 1996 (7,500 people) and 1999 (14,000 people), and increased more than seven-fold between 1976 (2,500 people) and 1999 (Forest Service 2001b). More recent data indicates that day use of backcountry trails has continued to increase in popularity. Trail running, for instance, is among those uses for which participation as grown dramatically over the last decade. The number of trail running participants more than doubled nationally between 2007 and 2017, from around 4 million participants to more than 9 million participants (Outdoor Foundation 2018). The eastern Sierra attracts elite and amateur trail runners (including ultra-runners) as evidenced by articles in multiple running and outdoor magazines and websites, and by local shops, trail running events, and local programs that advertise and cater to mountain runners. The proximity of the Rush Creek Trailhead to SR-158, a popular scenic drive, and the attraction of Horsetail Falls (visible from the Rush Creek Trail between the trailhead and Agnew Lake) likely contribute to high day-use visits to Project reservoirs.

The Project has historically impounded water at Agnew, Gem, and Waugh lakes and these impoundments likely contributed to destination camping, fishing, and swimming. Since the seismic restrictions have been in effect, the quantity of water available for recreational use has decreased and the scenic quality of the lakes has diminished (refer to Section 4.12, Aesthetics for a discussion of visual resources of the vicinity of the Project). The recreation impacts associated with the lower water levels at each lake vary. At Waugh Lake, the near absence of water compared to pre-seismic conditions has likely dramatically limited use of this waterbody as a location for activities such as dispersed camping or lake fishing. Gem Lake, by far the biggest of the three lakes, retains its appeal for swimming and fishing, as the lower water levels associated with the seismic restrictions have created more accessible beach shoreline, and increased the area available for dispersed camping. Agnew Lake retains swimming and fishing appeal as a natural lake tucked into a steep, rocky escarpment.

4.11.5.2 Packer Use

The Forest Service estimates that, in general, commercial use in the Ansel Adams Wilderness from east side entries (east side of the Sierra Nevada) constitutes 16% of total use (Forest Service 2001b). Data from the Rush Creek Trailhead collected between 1996 and 2000 indicates that commercial overnight trips from this location are higher than the average. As many as 26% of the approximately 1,700 people that accessed the backcountry for an overnight stay originate from the Rush Creek Trailhead each year traveled with a commercial pack station outfitter. Frontier Pack Station located adjacent

to the trailhead operates under a Forest Service Special Use Permit with an allocation of service days from the Forest Service.

4.11.5.3 Camping

Developed camping facilities are numerous along SR-158 and include four Forest Service campgrounds and five privately-run RV parks. These facilities generally include potable water, flush restrooms and/or vault toilets, fire-rings, parking areas, and, in some cases, on-site amenities such as laundry and general stores. Several of the RV parks include limited cabin accommodations in addition to parking and electricity for RV trailer hook-ups. In addition, two primitive camps are located in the vicinity of the Project – Billy Lake Stock Camp and Frontier Pack Station Camp. Both were established and are operated by Frontier Pack Station under a Forest Service Special Use Permit.

4.11.5.4 Fishing

Fishing is popular in Project reservoirs and the California Department of Fish and Wildlife (CDFW) and the Forest Service both identify that brook trout and rainbow trout are common. Recreation fishing has historically been supported by CDFW's stocking program. Current CDFW management direction for Waugh Lake is for a self-sustaining fishery and stocking was discontinued in 1965 (refer to Section 4.5). CDFW management direction for Agnew and Gem lakes is for a stocked "put and grow" fishery. Agnew and Gem lakes were last stocked in 2014 (refer to Section 4.5). Fishing is also popular downstream of the powerhouse (south of the Project boundary) at each of the four lakes along SR-158 – Grant, Silver, Gull, and June lakes. Fishing within Rush Creek itself is popular downstream of the powerhouse. Upstream of the powerhouse the steep gradient of the creek limits fishing opportunities in the creek itself. The Mono County Economic Development, Tourism and Film Commission describes the fishing in Rush Creek at the inlets and outlets of Silver Lake and Grant Lake as especially productive (Mono County Economic Development, Tourism and Film Commission 2021).

4.11.5.5 Water Recreation

Above the powerhouse, water recreation in Rush Creek, Agnew, Gem, and Waugh lakes is generally limited to wading and swimming activities. As discussed above, the seismic restrictions, which have nearly eliminated the water in Waugh Lake, have likely changed the desirability of that lake as a water recreation destination. Agnew Lake and Gem Lake, though noticeably lower with the seismic restrictions, retain sufficient water for fishing and swimming. Below the powerhouse Grant, Silver, Gull, and June lakes are all popular destinations for swimming and boating. Publicly accessible boat launches and/or marinas are features at each of the lakes, and there are multiple campgrounds, picnic areas and RV parks that cater to visitors seeking time on the water.

4.11.5.6 Winter Recreation

June Mountain Ski Area is a winter resort near the community of June Lake about two miles east of the Rush Creek Powerhouse complex via SR-158. The mountain offers 1,500 accessible acres to skiers via seven ski lifts (two high-speed quads, four doubles and one people mover for beginners). In addition to the ski area, the backcountry around the ski resort, including the Rush Creek drainage, includes many ski touring options.

Other winter recreation activities include cross country skiing near and along the closed section of SR-158 (just past the powerhouse), and ice skating on Grant, Silver, and June lakes if the temperatures are cold enough and the lakes sufficiently free of snow. In addition, ice-climbing has occurred at a location approximately 0.2 mile north of the powerhouse on SCE property (outside the FERC Project boundary), and near Horsetail Falls approximately 0.4 mile west of the powerhouse on Forest Service property. However, SCE has posted “No Trespassing/Loitering” and “No Climbing on Rocks” signs at the location north of the powerhouse prohibiting access on SCE property outside of the FERC Project boundary.

4.11.6 Current and Future Recreation Needs Identified in Management Plans

The FERC regulations require a discussion of current and future recreation needs identified in state comprehensive plans and regional conservation and recreation plans. The following adopted plans pertain to recreation and may include management direction and/or recreation use and demographic information (e.g., trends in use intensity and recreation preferences) with applicability to the Project:

- California Department of Parks and Recreation. Statewide Comprehensive Outdoor Recreation Plan (SCORP). Available at: https://www.parksforcalifornia.org/scorp/.
    - 2015 SCORP: The SCORP provides a strategy for statewide outdoor recreation leadership and action to meet the state's identified outdoor recreation needs. The action plan is derived from public input and a statewide evaluation of existing park and recreation lands. California’s SCORP Action Plan is updated every five years. The SCORP is required for the state to be eligible for Land and Water Conservation Fund grants through the National Park Service (CDPR 2015).
- Mono County General Plan Update. 2015. Available at: https://monocounty.ca.gov/planning/page/general-plan.
    - The Conservation/Open Space Element includes Goal 18 (and supporting objectives and policies), pertaining to conservation and enhancement of the June Lake Loop’s natural, scenic and cultural resources; and also includes Goal 21 (and supporting objectives and policies) pertaining specifically to opportunities for outdoor recreation in the County.

- Land Management Plan for the Inyo National Forest (Forest Service 2019a).
    - The Land Management Plan includes desired conditions and other plan components that apply to forestwide recreation (excluding designated wilderness) in Chapter 2, Forestwide Desired Conditions and Management Direction, Sustainable Recreation. The expressed desired conditions, along with objectives, goals, standards, guidelines, and potential management approaches all inform INF management decisions on current and future activities and visitor expectations. The plan also describes recreation management areas (RMA) that provide management direction for particular recreation experiences and activities. There are three RMAs that apply to lands (outside of wilderness areas) on the INF: Destination Recreation Area (high levels of recreation); general Recreation Area (moderate/mixed levels of recreation); and Challenging Backroad Area (low levels of recreation). The Forest Service identifies the area on both sides of SR-158, including the area around the Rush Creek Powerhouse as a Destination Recreation Area with high recreation use. The Forest Service does not designate the area above Gem Dam (the Ansel Adams Wilderness) with a recreation use category (Forest Service 2019a).

- Wilderness Management Plan for the Ansel Adams, John Muir, and Dinkey Lakes Wildernesses, Inyo and Sierra National Forests (Forest Service 2001a).
    - The Wilderness Management plan provides management direction for the Ansel Adams Wilderness, including direction pertaining to the existing trail system; recreation use, campfires, campsite conditions, campsite density standards, forage for recreation stock, signage, and also sets the permit and rationing system for access (implemented as the quota system for wilderness permits per trailhead).

- Mammoth Lake Trails Public Access (MLTPA). 2021. CALREC Vision: Cross-Jurisdictional Collaboration to Advance Sustainable Outdoor Recreation in California.
    - Sponsored and initiated by the MLTPA, the CALREC Vision project is working to highlight the essential, multi-benefit role that outdoor recreation plays in California. MLTPA has been engaged with local and regional issues of sustainable recreation and collaboration in California's Eastern Sierra since its inception and provides technical support to a regional public/public recreation-based solution, the Eastern Sierra Sustainable Recreation Partnership. CALREC Vision reviews recently passed policies that offer incentives for collaboration, underscores the urgency for realizing sustainable outdoor recreation in California, suggests objectives on which collaboratives can focus, and identifies next steps for furthering this important work.

4.11.7 References

CDPR (California Department of Parks and Recreation). 2015. 2015 Statewide Comprehensive Outdoor Recreation Plan (SCORP). Available at: https://www.parksforcalifornia.org/scorp/.

Forest Service (United States Forest Service). 2001a. Ansel Adams, John Muir, and Dinkey Lakes Wilderness Management Plans. April 2001. Available at: https://www.fs.usda.gov/detailfull/inyo/landmanagement/planning/?cid=FSBDEV3_003888&width=full.

———. 2001b. Management Direction for the Ansel Adams, John Muir and Dinkey Lakes Wilderness. Final Environmental Impact Statement. March 2001. Available at: https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fsbdev3_003701.pdf.

———. 2019a. Land Management Plan for the Inyo National Forest. Available at: https://www.fs.usda.gov/main/inyo/landmanagement/planning.

———. 2019b. Final Environmental Impact Statement for Revision of the Inyo National Forest Land Management Plan, Volume 1. September 2019.

———. 2021a. Inyo National Forest website. Recreation. June Lakes Area Trails. Rush Creek Trail. Available at: https://www.fs.usda.gov/recarea/inyo/recreation/fishing/recarea/?recid=20668&actid=42. Accessed May 9, 2021.

———. 2021b. Inyo National Forest website. Recreation Passes & Permits. Available at: https://www.fs.usda.gov/main/inyo/passes-permits/recreation. Accessed May 9, 2021.

MLTPA (Mammoth Lake Trails Public Access). 2021. CALREC Vision: Cross-Jurisdictional Collaboration to Advance Sustainable Outdoor Recreation in California. Available at: https://www.calrecvision.org/.

Mono County. 2015. Regional Transportation Plan and General Plan Update and General Plan Update Draft Environmental Impact Report.

Mono County Economic Development, Tourism and Film Commission. 2021. Available at: https://www.monocounty.org/places-to-go/lakes-rivers-creeks/rush-creek/. Accessed June 15, 2021.

Outdoor Foundation. 2018. 2018 Outdoor Participation Report. 419 7th Street, NW, Suite 401, Washington DC 2004. Available at: https://outdoorindustry.org/resource/2018-outdoor-participation-report/.

This Page Intentionally Left Blank

TABLES

This Page Intentionally Left Blank

Table 4.11-1. Developed Recreation Facilities in the Vicinity of the Rush Creek Project

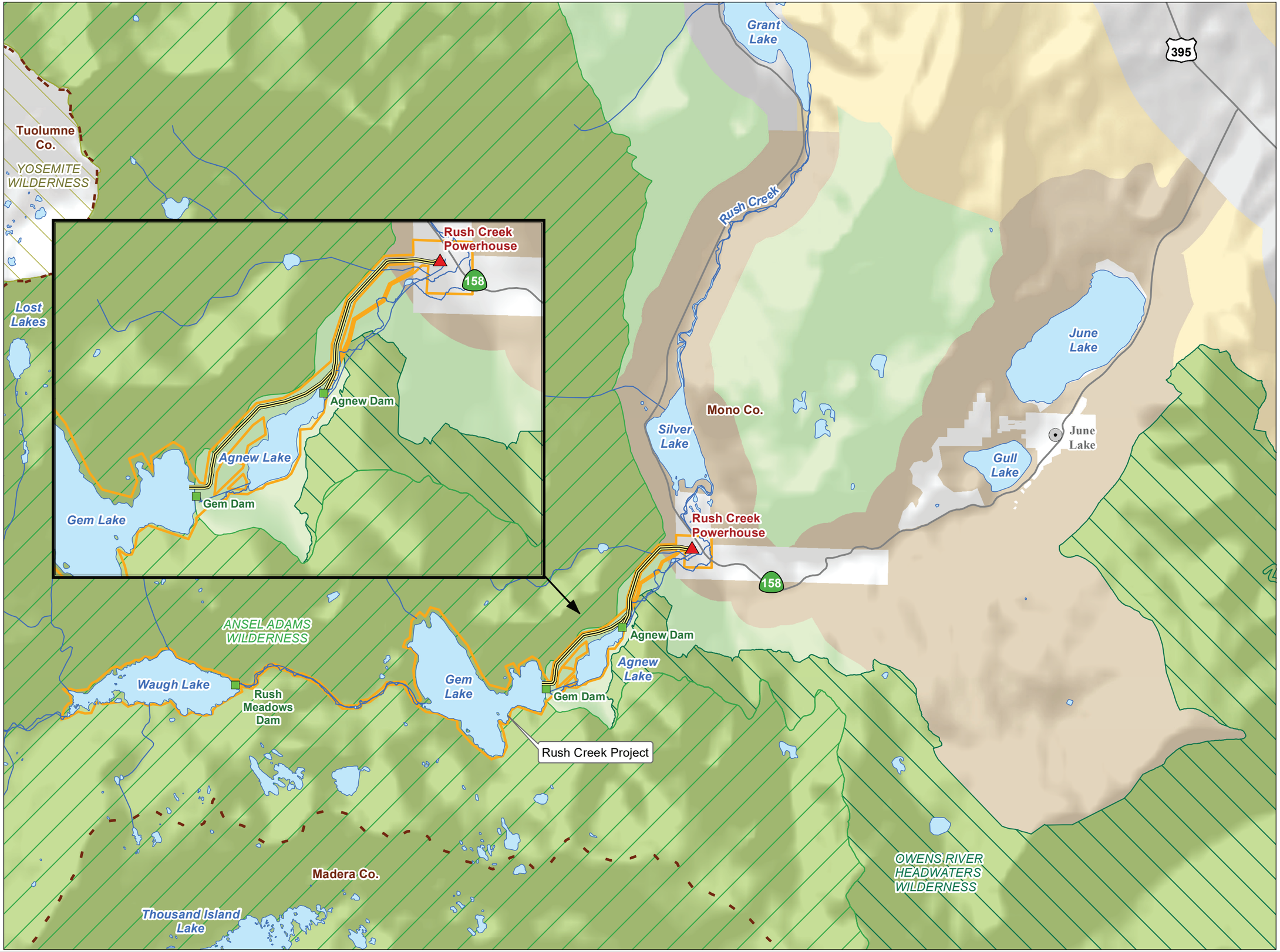
General Location/Facility Type	Facility Name	Within or Crossing Project Boundary?	Jurisdiction/ Ownership	Number of Individual Sites (if applicable)	Total Capacity (6 PAOT/site)	Information Sources
June Lake						
Campground	June Lake Campground	No	Forest Service	28	168	https://www.fs.usda.gov/recarea/inyo/recarea/?recid=20570
Campground	Oh Ridge Campground	No	Forest Service	143	858	https://www.fs.usda.gov/recarea/inyo/recarea/?recid=20576
Day-Use Area	June Lake Beach	No	Forest Service	NA	NA	https://www.fs.usda.gov/recarea/inyo/recarea/?recid=20560
Marina	June Lake Marina	No	Private	NA	NA	https://www.junelakemarina.net/
Marina, Boat Launch, and Cabins	Big Rock Resort	No	Private	8 cabins	48	https://www.bigrockresort.net/
RV Park	June Lake RV Park	No	Private	17 RV sites, 3 rental houses	NA	https://www.junelakervpark.com/
RV Park	Pine Cliff Resort	No	Private	Unknown	NA	http://pinecliffresort.net/
Gull Lake						
Boat Launch (Car Top only)	Gull Meadows Boat Launch	No	Forest Service	NA	NA	https://www.fs.usda.gov/recarea/inyo/recarea/?recid=20582
Campground	Gull Lake Campground	No	Forest Service	11	66	https://www.fs.usda.gov/recarea/inyo/recarea/?recid=20568
Marina	Gull Lake Marina	No	Private	NA	NA	https://gulllakemarina.com/
RV Park and Campground	Golden Pine RV Park	No	Private	25 RV Spaces	NA	https://www.goldenpinervpark.com/
Campground	Reversed Creek Campground	No	Forest Service	17	102	https://www.fs.usda.gov/recarea/inyo/recarea/?recid=20566
Ski Area	June Mountain	No	Private	NA	NA	https://www.junemountain.com/
Silver Lake						
Boat Launch	Silver Lake Boat Launch	No	Forest Service	NA	NA	https://www.fs.usda.gov/recarea/inyo/recarea/?recid=20574
Campground	Silver Lake Campground	No	Forest Service	63	378	https://www.fs.usda.gov/recarea/inyo/recarea/?recid=20564
Day-Use Area / Picnic Area	Silver Lake Picnic Area	No	Forest Service	NA	NA	https://www.fs.usda.gov/recarea/inyo/recarea/?recid=20582
RV Park and Cabins	Silver Lake Resort	No	Private	81 RV Spaces, 15 cabins, 3 rental houses	NA	https://silverlakeresort.net/rv-park/
Pack Station	Frontier Pack Station	No	Private	NA	NA	https://frontierpacktrain.com/

General Location/Facility Type	Facility Name	Within or Crossing Project Boundary?	Jurisdiction/ Ownership	Number of Individual Sites (if applicable)	Total Capacity (6 PAOT/site)	Information Sources
Rush Creek						
Day-Use Area / Picnic Area / Overflow Campground	Aerie Crag Day-Use Area	No	Forest Service	10	60	https://www.fs.usda.gov/recarea/inyo/recarea/?recid=20580
Grant Lake						
RV Park, Marina, and Campground	Grant Lake Resort	No	Private	70 RV Spaces	NA	https://grantlakeresort.com/campground/
Backcountry						
Forest Service Trail	Alger Lakes Trail	Yes	Forest Service	NA	NA	https://www.fs.usda.gov/recarea/inyo/recreation/recarea/?recid=20668&actid=51
Forest Service Trail	Clark Lakes Trail	Yes	Forest Service	NA	NA	https://www.fs.usda.gov/recarea/inyo/recreation/recarea/?recid=20668&actid=51
Forest Service Trail	Davis Lake Trail	No	Forest Service	NA	NA	https://www.fs.usda.gov/recarea/inyo/recreation/recarea/?recid=20668&actid=51
Forest Service Trail	Fern Lake Trail	No	Forest Service	NA	NA	https://www.fs.usda.gov/recarea/inyo/recarea/?recid=20670
Forest Service Trail	John Muir Trail	No	Forest Service	NA	NA	https://www.fs.usda.gov/recarea/inyo/recreation/hiking/recarea/?recid=20542&actid=30
Forest Service Trail	Marie Lakes Trail	No	Forest Service	NA	NA	https://www.fs.usda.gov/recarea/inyo/recreation/hiking/recarea/?recid=20542&actid=31
Forest Service Trail	Pacific Crest Trail	No	Forest Service	NA	NA	https://www.fs.usda.gov/recarea/inyo/recreation/recarea/?recid=20668&actid=51
Forest Service Trail	Parker Bench Trail	No	Forest Service	NA	NA	https://www.fs.usda.gov/recarea/inyo/recreation/recarea/?recid=20668&actid=51
Forest Service Trail	Rush Creek Trail	Yes	Forest Service	NA	NA	https://www.fs.usda.gov/recarea/inyo/recreation/recarea/?recid=20668&actid=51
Forest Service Trail	Spooky Meadow Trail	Yes	Forest Service	NA	NA	https://www.fs.usda.gov/recarea/inyo/recreation/recarea/?recid=20668&actid=51
Forest Service Trail	Weber Lake Trail	Yes	Forest Service	NA	NA	https://www.fs.usda.gov/recarea/inyo/recreation/recarea/?recid=20668&actid=51
Forest Service Trail	Yost Lake Trail	No	Forest Service	NA	NA	https://www.fs.usda.gov/recarea/inyo/recarea/?recid=20670
Forest Service Trail	Yost Meadow Loop Trail	No	Forest Service	NA	NA	https://www.fs.usda.gov/recarea/inyo/recarea/?recid=20670

*This list of facilities is reflected in Map 4.11-2, Development Recreation Facilities in the Vicinity of the Rush Creek Project

MAPS

This Page Intentionally Left Blank



SCE Facilities

- Dam
- Powerhouse
- Flowline / Penstock
- FERC Boundary

Other Features

- Major City/Town
- Highway
- River/Stream
- Lake
- County Boundary

Recreation Opportunity Spectrum*

- Modified/Roaded
- Natural/Roaded
- Rural
- Semi-Primitive/Non-motorized
- Primitive

*SOURCE: USFS, 2019

National Wilderness Areas

- Ansel Adams Wilderness
- Owens River Headwaters Wilderness
- Yosemite Wilderness

SOUTHERN CALIFORNIA EDISON®
An EDISON INTERNATIONAL® Company

Rush Creek Project (FERC 1389)

Map 4.11-1

Recreation Resources Setting

0 0.25 0.5 Miles

Projection: UTM Zone 11
Datum: NAD 83

Date: 5/12/2021

C:\GIS\Cardno\30735240_SCE_EasternHydro\map\Rush Creek\RecMaps\SCE_RUSH_CREEK_RecResSetting_17i11i_01.mxd

This Page Intentionally Left Blank

SCE Facilities

- Dam
- Powerhouse
- Flowline / Penstock
- FERC Boundary

Other Features

- Major City/Town
- Highway
- River/Stream
- Lake
- County Boundary

Land Jurisdiction and National Wilderness Areas/Parks*

- U.S. Forest Service
- Ansel Adams Wilderness (U.S. Forest Service)
- Owens River Headwaters Wilderness (U.S. Forest Service)
- Yosemite National Park / Yosemite Wilderness (National Park Service)
- Private (Blank)

*SOURCES: BLM, 2020.
Mono Co., 2019.
Wilderness.net, 2019.

Developed Recreation Facilities and Trails

- Boat Launch
- Marina
- Car Top Boat Launch
- Campground
- Day-Use Area and/or Picnic Area
- Pack Station
- RV Park
- Resort
- Ski Area
- Pacific Crest Trail
- Other Major Trail

SOUTHERN CALIFORNIA EDISON®
An EDISON INTERNATIONAL® Company

Rush Creek Project (FERC 1389)

Map 4.11-2

Developed Recreation Facilities in the Vicinity of the Rush Creek Project

N W E S

0 0.25 0.5 Miles

Date: 7/14/2021

Projection: UTM Zone 11
Datum: NAD 83

C:\GIS\Cardno\30735240_SCE_EasternHydro\map\Rush Creek\RecMaps\SCE_RUSH_CREEK_DevRecFac_17i11i_02.mxd

This Page Intentionally Left Blank

TABLE OF CONTENTS

LIST OF TABLES

LIST OF MAPS

LIST OF APPENDICES

LIST OF ACRONYMS

ac-ft	acre-feet
cfs	cubic feet per second
FERC	Federal Energy Regulatory Commission
Forest Service	United States Forest Service
INF	Inyo National Forest
kV	kilovolt
LMP	Land Management Plan
Project	Rush Creek Project
SCE	Southern California Edison Company
SIO	Scenic Integrity Objective
SMS	Scenic Management System
SR	State Route
USGS	United States Geological Survey

This Page Intentionally Left Blank

4.12 AESTHETICS

This section describes the aesthetic resources in the vicinity of Southern California Edison Company's (SCE) Rush Creek Project (Project). The Federal Energy Regulatory Commission (FERC) content requirements for this section are specified in Title 18 of the Code of Federal Regulations Chapter I § 5.6(d)(3)(ix).

This section describes the facilities and surrounding landscape with respect to the United States Forest Service's (Forest Service) Scenery Management System (SMS). The SMS is a tool for integrating the benefits, values, desires, and preferences regarding aesthetics and scenery for all levels of land management planning (Forest Service 1995). Use of the SMS is relevant because most of the Project facilities are located within the Inyo National Forest (INF) managed by the Forest Service.

The information presented in this section focuses on describing the scenic conditions of the areas where the above-ground Project facilities are located, and the Forest Service Scenic Integrity Objective (SIO) associated with these locations. The SIO data used in this section was obtained from the 2019 SIO dataset available from the INF website on its "Geospatial Data" webpage.

4.12.1 Information Sources

This section was developed using existing information available in the following primary sources. Additional references are cited in the text, as appropriate.

- Environmental Assessment for Hydropower License, Rush Creek, FERC Project No. 1389-001, California (FERC 1992);
- FERC Order Issuing New License, Rush Creek Project. FERC Accession No. 19970210-0301 (FERC 1997);
- Land Management Plan for the Inyo National Forest (Forest Service 2019);
- Landscape Aesthetics: A Handbook for Scenery Management (Forest Service 1995); and
- Wilderness Management Plan for the Ansel Adams, John Muir, and Dinkey Lakes Wildernesses, Inyo and Sierra National Forests (Forest Service 2001).

4.12.2 Overview of the Scenery Management System

The SMS is a system of analysis to address the amount of visible impact created by man-made activities on National Forest lands. The SMS includes landscape character descriptions and scenic integrity objectives that can be used to help assess the compatibility of a project with the surrounding landscape.[1]

[1] Construction of the Project was completed in the early 1900s, prior to the development of the SMS.

In 1995, the Forest Service published Landscape Aesthetics: A Handbook for Scenery Management which is the guidance document for the SMS. SIOs were assigned to the management areas that comprise the INF as a part of the most recent INF Land Management Plan (LMP) update completed in 2019**.** As described in the INF LMP, management areas consist of land areas within the planning area that have the same set of applicable plan components. A map identifying the SIO for each management area of the INF is included in Appendix A of the INF LMP.

A SIO is the desired level of scenic quality and diversity of a landscape based on physical and sociological characteristics of an area. As described in the Handbook for Scenery Management, the Forest Service identifies scenic integrity as a continuum ranging over five levels: Very High, High, Moderate, Low, and Very Low. A landscape with very minimal visual disruption is considered to have very high scenic integrity. Those landscapes having increasingly discordant relationships among scenic attributes are viewed as having diminished scenic integrity. Descriptions of each scenic integrity level, as defined in the Handbook for Scenery Management include the following:

- Very High (VH) scenic integrity refers to landscapes where the valued landscape character “is” intact with only minute if any deviations. The existing landscape character and sense of place is expressed at the highest possible level.

- High (H) scenic integrity refers to landscapes where the valued landscape character “appears” intact. Deviations may be present but must repeat the form, line, color, texture, and pattern common to the landscape character so completely and at such scale that they are not evident.

- Moderate (M) scenic integrity refers to landscapes where the valued landscape character “appears slightly altered”. Noticeable deviations must remain visually subordinate to the landscape character being viewed.

- Low (L) scenic integrity refers to landscapes where the valued landscape character “appears moderately altered”. Deviations begin to dominate the valued landscape character being viewed but they borrow valued attributes such as size, shape, edge effect and pattern of natural openings, vegetative type changes or architectural styles outside the landscape being viewed. They should not only appear as valued character outside the landscape being viewed but compatible or complimentary to the character within.

- Very Low (VL) scenic integrity refers to landscapes where the valued landscape character “appears heavily altered”. Deviations may strongly dominate the valued landscape character. They may not borrow from valued attributes such as size, shape, edge effect and pattern of natural openings, vegetative type changes or architectural styles within or outside the landscape being viewed. However, deviations must be shaped and blended with the natural terrain (landforms) so that elements such as unnatural edges, roads, landings, and structures do not dominate the composition.

Map 4.12-1 shows the designated Forest Service SIO with respect to Project facilities within the INF. The SIO for all lands within the Ansel Adams Wilderness is "Very High". All other National Forest lands within the vicinity of the Project are designated as having a "High" SIO. Table 4.12-1 identifies the above-ground Project facilities and the SIO associated with the landscapes in which the facilities are located. Appendix 4.12-A includes representative photographs of the landscape surrounding the Project facilities.

4.12.3 Description of Existing Condition

The Project is located on Rush Creek on the eastern slope of the Sierra Nevada in Mono County, California. The Project is situated approximately 4 miles southwest of the unincorporated community of June Lake and approximately 14 miles upstream from Mono Lake. The majority of the Project occupies federal lands within the INF, which is under the jurisdiction of the Forest Service.

A portion of the Project (Rush Meadows Dam, Waugh Lake, Gem Lake, and the upstream side of Gem Dam) is located within the Ansel Adams Wilderness. As noted in the Environmental Assessment (FERC 1992) prepared for the previous relicensing, Project facilities were built in the early 1900s, prior to the establishment of the wilderness area[2], and, while accepted by the Forest Service as nonconforming uses, are in conflict with the Forest Service SIO of "Very High" for the Ansel Adams Wilderness. The downstream side of Gem Dam, and the area below Gem Dam, including the Agnew Dam area, are outside of the Ansel Adams Wilderness but within the INF. In addition, the Owens River Headwaters Wilderness Area[3] is located east of Agnew Lake. Northeast of Agnew Dam, a 135-foot section of the 4 kilovolt (kV) power line, which connects Rush Creek Powerhouse to Agnew Dam, crosses the Owens River Headwaters Wilderness Area, however no poles/towers are located within the wilderness area. The area around the Rush Creek Powerhouse is located on SCE-owned lands.

Elevations in the vicinity of the Project range from approximately 9,400 feet at Waugh Lake to approximately 7,300 feet near the Rush Creek Powerhouse. The vicinity of the Project, like much of the surrounding landscape of the eastern Sierra Nevada, was carved by glaciers and is characterized by dramatic mountains, sheer ridges, granite basins, and expansive open vistas. Within the vicinity of the Project, vistas to the east are of the Great Basin and to the west of the Sierra Crest. Several prominent peaks along the crest are visible from western-facing viewpoints around Agnew, Gem, and Waugh lakes including Mount Maclure (12,694 feet), Mount Lyell (13,101 feet), Rodgers Peak (12,865 feet), and Mount Davis (12,225 feet).

The terrain in the vicinity of the Project is exposed and rocky, and includes large granitic formations, steep topography, alpine lakes (including Gem Lake and Agnew Lake) and fast flowing streams that drop sharply through the mountain canyons. The most dramatic of these drops may be Horsetail Falls, formed by Rush Creek, and visible above the Rush

[2] Ansel Adams Wilderness Area was originally established by Congress as part of the original Wilderness Act in 1964. At that time, it was designated as the Minarets Wilderness. In 1984, after Ansel Adams' death, the area was renamed in his memory.

[3] The Owens River Headwaters Wilderness Area was designated by Congress on March 31, 2009.

Creek Powerhouse from State Route 158 (SR-158) and from the Rush Creek Trail. At the falls, water in the creek drops approximately 270 feet in elevation. During high releases of water from Agnew Dam and during spills, the falls are among the largest in the eastern Sierra, though most of the time the smaller volume of water associated with the current minimum in-stream flow from Agnew Lake creates a tempered waterfall that is barely visible from the highway.

High elevation vegetation near the Project includes shrubs (e.g., species of sagebrush, manzanita, and currents) along with stands of lodgepole pines, aspen, and scattered juniper. Riparian areas line Rush Creek and other drainages in the summer.

Between 2008 and 2013, SCE conducted detailed fault studies, structural testing and engineering analysis of Agnew, Gem, and Rush Meadows dams as a consequence of the Silver Lake Fault being identified as a potential safety concern in 2007. As a result, and as ordered by FERC, new reservoir operations were initiated in 2012 that implemented seismic restrictions on reservoir elevations including maintaining Waugh Lake at an elevation of 9,392.1 feet; Gem Lake at 9,027.5 feet; and Agnew Lake to remain completely drained (see Section 2.4.1, Seismic Restrictions).

These FERC-mandated seismic restrictions override the Forest Service 4(e) Conditions[4] in the existing license that require specific reservoir elevations be maintained during certain water years and time periods. In addition, they have created a perpetual “bathtub ring” around the edge of all three reservoirs, exposing the lake bottom and tree stumps. The lower water levels also expose more of the upstream dam surface area at each lake making those facilities a more prominent component of the visual landscape. When snow is present (e.g., during the winter and spring) it obscures visual evidence of the “bathtub ring” around the reservoirs.

The Forest Service identifies the lands encompassing the Project facilities as recreation areas with use designations of “high”, “mixed/moderate”, and “low”. In the immediate vicinity of the Rush Creek Powerhouse (visible from SR-158), the Forest Service identifies the area as a high use destination recreation area. Upstream towards Agnew Lake, the Forest Service identifies the area as one of mixed/moderate recreation use. Further upstream towards the Ansel Adams Wilderness, the Forest Service identifies the area as low recreation use due to access challenges (Forest Service 2019). Section 4.11, Recreation Resources, provides a full description of the recreation resources in the vicinity of the Project.

Public access to Project reservoirs is via the Rush Creek Trail. The trailhead is located in a paved parking area at the northern end of Silver Lake on the west side of SR-158. From the trailhead, the Rush Creek Trail extends south and parallel to SR-158, before turning west and generally climbing along the northern shores of Agnew, Gem, and Waugh lakes. The Rush Creek Trail terminates at its junction with the John Muir Trail (a portion of the Pacific Crest Trail) approximately 9.1 trail miles from the Rush Creek Trail trailhead. The Pacific Crest Trail is designated as National Scenic Trail under the 1968 National Scenic

[4] Forest Service 4(e) Condition No. 8 – Recreation and Wilderness Management.

Trails Act (Forest Service 2021a). Side trails extend from the Rush Creek Trail towards other wilderness destinations including Alger Lakes and Parker Pass; Clark Lakes and Agnew Pass; and to Spooky Meadow (Forest Service 2021b).

The following describes the above-ground Project facilities, organized by area: Rush Meadows Dam, Gem Dam, Agnew Dam, and Rush Creek Powerhouse; and the SIOs associated with each area. Refer to Section 2.0, Existing Project Location, Facilities, and Operations for additional information on Project facility specifications and Map 2-4a-c for the location of Project facilities discussed in this section.

4.12.3.1 Rush Meadows Dam Area

The most visually prominent Project facility in the area is Rush Meadows Dam. The dam is a concrete radial-arch structure originally constructed in 1918 and subsequently raised in 1924 and 1925 to its current height and storage capacity. Before construction of the dam there was no established lake at the site of Waugh Lake, but rather the area was referred to simply as Rush Creek Meadows, a meadow landscape at the foot of Mount Lyell at an elevation of 9,500 feet (Theodoratus Cultural Research, Inc. 1988). The crest of the Rush Meadows Dam is 463 feet long and located at 9,419 feet in elevation. The maximum height of the dam is 50 feet. Metal pipe handrails are installed along a runway atop the crest of the dam. A geomembrane layer covers the upstream face of the dam. The north end of the dam abuts the canyon wall and the south end is buttressed. The south end of the dam adjoins a wing wall that contains the spillway.

In 2018, an additional notch was constructed in the spillway to increase the capacity to pass inflows during high-runoff years to facilitate compliance with the FERC-mandated restricted reservoir elevation. The 12-foot-wide by roughly 19-foot-high notch was installed in the spillway's left section and reinforced with two concrete buttresses on the downstream side. The crest elevation of the new spillway notch is 9,395.6 feet.

Water from Waugh Lake is released into Rush Creek via a concrete inlet chamber at the base of the dam. Two slide gates installed in the dam face control the flow of water into two steel outlet pipes that discharge into Rush Creek. Below Rush Meadows Dam, the existing license requires a continuous minimum flow of 10 cubic feet per second (cfs) or natural flow into Waugh Lake, whichever is less.[5]

As originally designed, Rush Meadows Dam impounded Waugh Lake, a 185-acre reservoir with a storage capacity of 5,277 acre-feet (ac-ft). Since 2012, as required by FERC, Waugh Lake has been limited to an elevation of 9,392.1 feet to meet seismic restrictions resulting in a 130-acre reservoir and a storage capacity of 1,555 ac-ft.

The lake bed is surrounded by sloping granite slabs. Stands of lodgepole pine mixed with other conifers hug what was the shoreline of the reservoir, especially on its south and west sides where the elevation gradient from the floor of the lake's basin rises less steeply

[5] Forest Service 4(e) Condition No. 5 – Minimum Streamflow Requirements.

than on the north side of the lake. The valley within which Waugh Lake is located is most narrow at its eastern outlet, across which the Rush Meadows Dam is constructed.

Other Project facilities in the Rush Meadows Dam area are located downstream of the dam on its north abutment and include a gage house, solar facility, equipment shed, and valve house. The gage house and equipment shed are painted a Forest Service green.

Rush Meadows Dam, Waugh Lake, and ancillary facilities near the dam are visible from the Rush Creek Trail.

Table 4.12-1 identifies facilities in the Rush Meadows Dam area, and their associated land jurisdiction and SIO designation. All Project facilities within the Rush Meadows Dam area are on the INF in the Ansel Adams Wilderness with a 'Very High' SIO designation.

4.12.3.2 Gem Dam Area

The most visually prominent Project facility in the area is Gem Dam. Gem Dam is a reinforced concrete multiple-arch structure originally constructed from 1915–1917, with an additional gravity section added in 1924. Before construction of the dam, Gem Lake was originally three small natural lakes each at about 8,982 feet elevation making it possible for a single reservoir to be formed with construction of the dam at the lowest lake's outlet (Theodoratus Cultural Research, Inc. 1988). The crest of the dam is 688 feet long and located at 9,057 feet elevation. The maximum height of the dam is 84 feet. Metal pipe handrails are installed along a runway atop the crest. A geomembrane layer covers the upstream face of the dam. The dam is comprised of 16 full arches adjoined by buttresses, and two partial arches at each end. Each full arch segment is 40 feet wide between the centers of the adjoining buttresses. Two spillways are located at the south end of the dam.

Water from Gem Lake is released into Rush Creek via a low-level outlet pipe at the eastern downstream face of the dam. Below Gem Dam, the existing license requires a continuous minimum flow of 1 cfs or natural flows when the level of Gem Lake falls below the level of the face of the dam.[6]

As originally designed, Gem Dam impounded Gem Lake, a 282-acre reservoir with a storage capacity of 17,228 ac-ft. Since 2012, as required by FERC, Gem Lake has been limited to an elevation of 9,027.5 feet to meet seismic restrictions resulting in a 256-acre reservoir with a storage capacity of 10,752 ac-ft.

The lake is bound by granite shelves that slope into the water. Much of the shoreline is exposed rock with some scattered vegetation. The Sierra Crest is visible from western-facing vantage points, including from the top of Gem Dam and from the Rush Creek Trail as it tops out above the dam. The lower reservoir elevation creates a bathtub ring around the lake that makes the dam and reservoir more obvious features of the landscape.

[6] Forest Service 4(e) Condition No. 5 – Minimum Streamflow Requirements.

On the downstream side of the dam, there are several ancillary facilities that are also visually prominent. The Gem Tram, an approximately 0.28-mile long incline railroad used to transport personnel and equipment between Agnew Lake and Gem Lake is a distinct linear feature that follows along the shoulder of the Rush Creek drainage and terminates at the southern abutment of Gem Dam. Buildings include a bunkhouse, cookhouse, outhouse, valve house and cabin. Other facilities include a weather station and satellite dish, solar facility, and several bridges and footbridges across Rush Creek (Tram Bridge, Fish Release Footbridge, and Tram Landing Footbridge). Gem Lake Dock is located on the south abutment of the dam. The Gem Lake Motor Barge is stored here and used to transport personnel and equipment across the lake. There is also a compressor shed and storage shed on the south abutment of the dam along with two overhead hoist houses – one to transport materials along the dam length and another to lift the barge into the lake. Several Project trails traverse to and between the Gem Dam facilities.

Gem Dam, Gem Lake, and associated ancillary facilities are visible from Rush Creek Trail.

Table 4.12-1 identifies facilities in the Gem Dam area, and their associated land jurisdiction and SIO designation. All Project facilities within the Gem Dam area are on the INF. The majority of these facilities are outside the Ansel Adams Wilderness boundary and on land with a ‘High’ SIO designation. Those Project facilities within the Ansel Adams Wilderness (including Gem Lake) are on land with a ‘Very High’ SIO designation.

4.12.3.3 Agnew Dam Area

The most visually prominent Project facility in the area is Agnew Dam. Agnew Dam is a reinforced concrete, multiple-arch structure constructed between 1915 and 1917. Before construction of the dam, Agnew Lake was a small natural lake (Theodoratus Cultural Research, Inc. 1988). The crest of Agnew Dam is 278 feet long and located at 8,499 feet in elevation. The maximum height of the dam is 30 feet. Metal pipe handrails are installed along a runway atop the crest. A geomembrane layer covers the upstream face of the dam. The dam is comprised of five full arches adjoined by buttresses, and two partial arches at each end, which are designated from north to south as Arches No. 1 to No. 7. Each full arch segment is 40 feet wide between the centers of the adjoining buttresses. Spillways are located in Arches No. 5 and No. 6. Each spillway is comprised of eight rectangular openings, each approximately 5 feet wide and 2 feet high, arranged in a horizontal row just below the crest of the dam, at 8,496 feet in elevation.

A steel outlet pipe passes through the base of the dam. As the pipe (flowline) exits the dam and continues to the Agnew Junction, two valves along the pipe allow for releases directly into Rush Creek to pass high flows downstream and to maintain the minimum in-stream flow requirements of the existing license which include maintaining a continuous minimum flow of 1 cfs into Rush Creek below Agnew Dam.

As originally designed, Agnew Dam impounded Agnew Lake, a 40-acre reservoir with a storage capacity of 810 ac-ft. Since 2013, under the FERC-mandated storage restrictions, only a small natural lake (23 acres; 569 ac-ft), that pre-dates the Project, exists upstream of the dam. The natural lake is tucked into an alpine basin with a steep southern facing

escarpment of unconsolidated rocky material. The basin is surrounded by sparse vegetation, mostly consisting of shrubs and some pines. The lower reservoir elevation creates a bathtub ring around the lake that makes the dam and reservoir more obvious features of the landscape.

In 2017, SCE modified Agnew Dam by cutting two notches (each measuring 6 feet, 2 inches high by 5 feet wide) into the base of Arch 5 and 6. As stated above, Arches 5 and 6 were originally constructed with spillway slots at the top of the dam. SCE cut the notches in the base of Arch 5 and 6 to allow the dam to pass high flows downstream at the seismic restricted elevation and constructed two buttress walls on the downstream side of each notch to provide additional stability and prevent downcutting or scour behind the dam.

Adjacent to and downstream of the dam, there are several ancillary facilities that are also visually prominent. Agnew Tram, an approximately 0.81-mile-long incline railroad used to transport personnel and equipment is a distinct linear feature running between the Rush Creek Powerhouse and the Agnew Tram Hoist House. Other visible Project features include the 4-kV Rush Creek Powerhouse to Agnew Dam Power Line and Agnew Lake Dam Power Line; a cabin and weather station to the south of the dam; Agnew Dam to Agnew Junction Flowline; Agnew Junction Valve House and Stand Pipe; and the Lower Agnew Lake Boathouse and Dock. There is also an Upper Agnew Lake Boathouse and Dock on the southwest end of the lake.

Agnew Dam, Agnew Lake, and associated ancillary facilities are visible from Rush Creek Trail.

Table 4.12-1 identifies facilities in the Agnew Dam area, and their associated land jurisdiction and SIO designation. All Project facilities within the Agnew Dam area are on the INF with an SIO designation of ‘High’.

4.12.3.4 Rush Creek Powerhouse Area

The Rush Creek Powerhouse is located on SCE-owned land within an approximately 10-acre complex along the west side of SR-158 at an elevation of 7,253 feet. The complex is accessed via the Rush Creek Powerhouse Complex Access Road. Two gated entry points are present off of SR-158. The complex is mostly paved and includes the powerhouse and several ancillary facilities to support Project operations as described below.

The powerhouse itself is a two-story structure that is approximately 40 feet wide by 80 feet long, and 63 feet high. Two 28-inch diameter steel penstocks enter the west side of the powerhouse. From Agnew Junction, both penstocks are underground until 75 feet before entering the Rush Creek Powerhouse where they become visible. On the east side of powerhouse, a 470-foot-long tailrace returns water to Rush Creek. The associated transformer, switchyard, substation, and 115-kV overhead transmission lines extending from the switchyard are non-Project facilities. However, the 150-foot-long overhead, 2.4-kV Switchyard to Powerhouse Transmission Line is a Project facility that provides

power to the Project. Other ancillary facilities include: cottages; garages; warehouse and dock; machine shop; pump house; woodsheds, helicopter landing site; valve box; propane tank; a bridge over the powerhouse tailrace; and a bridge over Rush Creek.

The powerhouse is visible from vehicles travelling on SR-158, though views of most of the facilities are obscured by trees (evergreen conifers) and deciduous shrubs (including willows) especially in the warmer months when foliage is present on the shrubs. As the Rush Creek Powerhouse complex is not on INF land, Mono County General Plan policies regarding land use and development apply. The Mono County General Plan identifies that utility corridors and overhead utility line have become a visual issue in both community areas and undeveloped areas (Mono County 2020a) and includes policies that generally require utility lines to be installed underground (Mono County 2020b). However, this policy applies only to the installation of new utility lines and, therefore, does not apply to Project power and communication lines.

Table 4.12-1 identifies facilities in the Rush Creek Powerhouse area. None of the facilities associated with the Rush Creek Powerhouse area are on Forest Service lands, and therefore SIO designations do not apply.

4.12.4 References

FERC (Federal Energy Regulatory Commission). 1992. Environmental Assessment for Hydropower License, Rush Creek, FERC Project No. 1389-001, California. May 5.

———. 1997. Order Issuing New License, Rush Creek Project. FERC Accession No. 19970210-0301. 78 FERC ¶ 61,109. February.

Forest Service (U.S. Forest Service). 1995. Landscape Aesthetics – A Handbook for Scenery Management. Agricultural Handbook Number 701. December.

Forest Service (United States Forest Service). 2001. Ansel Adams, John Muir, and Dinkey Lakes Wilderness Management Plans. Available at: https://www.fs.usda.gov/detailfull/inyo/landmanagement/planning/?cid=FSBDEV3_003888&width=full.

———. 2019. Land and Resources Management Plan for the Inyo National Forest. Available at: https://www.fs.usda.gov/main/inyo/landmanagement/planning.

———. 2021a. Pacific Crest National Scenic Trail. Available at: https://www.fs.usda.gov/pct.

———. 2021b. Inyo National Forest Recreation. June Lakes Area Trails. Rush Creek Trail. Available at: https://www.fs.usda.gov/recarea/inyo/recreation/fishing/recarea/?recid=20668&actid=42.

Mono County. 2020a. Mono County General Plan, Conservation and Open Space Element – 2020. Available at: https://monocounty.ca.gov/planning/page/general-plan.

———. 2020b. Mono County General Plan, Land Use Element – 2020. Available at: https://monocounty.ca.gov/planning/page/general-plan.

Theodoratus Cultural Research, Inc. 1988. Historic Overview of the Rush Creek and Lee Vining Creek Hydroelectric Projects. Submitted to Southern California Edison Company. August. Available at: https://www.monobasinresearch.org/historical/hydropowerhistory.pdf.

TABLES

This Page Intentionally Left Blank

Table 4.12-1. Rush Creek Project Facilities Scenic Integrity Objectives

Project Facility	Land Ownership/ Jurisdiction	Scenic Integrity Objective (as applicable)
Rush Meadows Dam Area		
Dams		
Rush Meadows Dam	Forest Service	Very High
Reservoirs		
Waugh Lake	Forest Service	Very High
Valve House		
Rush Meadows Dam Valve House	Forest Service	Very High
Stream Gages		
Rush Creek below Rush Meadows (Waugh Lake) (USGS No. 10287262; SCE No. 359r)	Forest Service	Very High
Reservoir Gages		
Waugh Lake (USGS No. 10287260; SCE No. 359)	Forest Service	Very High
Trails		
Rush Meadows Dam Access Trail	Forest Service	Very High
Rush Meadows Dam / Waugh Lake Ancillary and Support Facilities		
Rush Meadows Dam Equipment Shed	Forest Service	Very High
Rush Meadows Dam Gage House	Forest Service	Very High
Rush Meadows Dam Solar Facility	Forest Service	Very High
Gem Dam Area		
Dams		
Gem Dam	Forest Service	High
Reservoirs		
Gem Lake	Forest Service	Very High
Flowline		
Gem Dam to Agnew Junction Flowline	Forest Service	High
Valve House		
Gem Valve House and Cabin	Forest Service	High
Gem Dam Arch 8 Valve House	Forest Service	High
Gem Flowline Valve House	Forest Service	High
Stream Gages		
Rush Creek below Gem Lake (USGS No. 10287281; SCE No. 352r)	Forest Service	High

Project Facility	Land Ownership/ Jurisdiction	Scenic Integrity Objective (as applicable)
Reservoir Gages		
Gem Lake (USGS No. 10287280; SCE No. 352)	Forest Service	High
Communication Lines		
Communication Line from Rush Creek Powerhouse to Gem Lake Dam	Forest Service	High
Communication Line from Gem Valve House to Arch 8 Valve House	Forest Service	High
Communication Line from Gem Tram Hoist House to Gem Valve House	Forest Service	High
Trams and Hoist Houses		
Gem Tram	Forest Service	High
Gem Tram Hoist House	Forest Service	High
Gem Tram Lower/Upper Landing	Forest Service	High
Trails		
Lower Gem Dam Access Trail	Forest Service	High
Gem Dam Arch 8 Access Trail	Forest Service	High
Upper Gem Dam Access Trail	Forest Service	High
Gem Dam / Lake Ancillary and Support Facilities		
Gem Lake Dock	Forest Service	High
Gem Lake Motor Barge	Forest Service	High
Gem Bunkhouse	Forest Service	High
Gem Outhouse	Forest Service	High
Gem Cookhouse	Forest Service	High
Gem Dam Compressor Shed	Forest Service	High
Gem Dam Storage Shed	Forest Service	High
Gem Dam Overhead Hoist House for Dam Length	Forest Service	High
Gem Dam Overhead Hoist House	Forest Service	High
Gem Fish Release Footbridge	Forest Service	High
Gem Tram Landing Footbridge	Forest Service	High
Gem Tram Bridge	Forest Service	High
Gem Weather Station	Forest Service	High
Gem Satellite Dish	Forest Service	High
Gem Solar Facility	Forest Service	High
Gem Valve House Tunnel	Forest Service	High

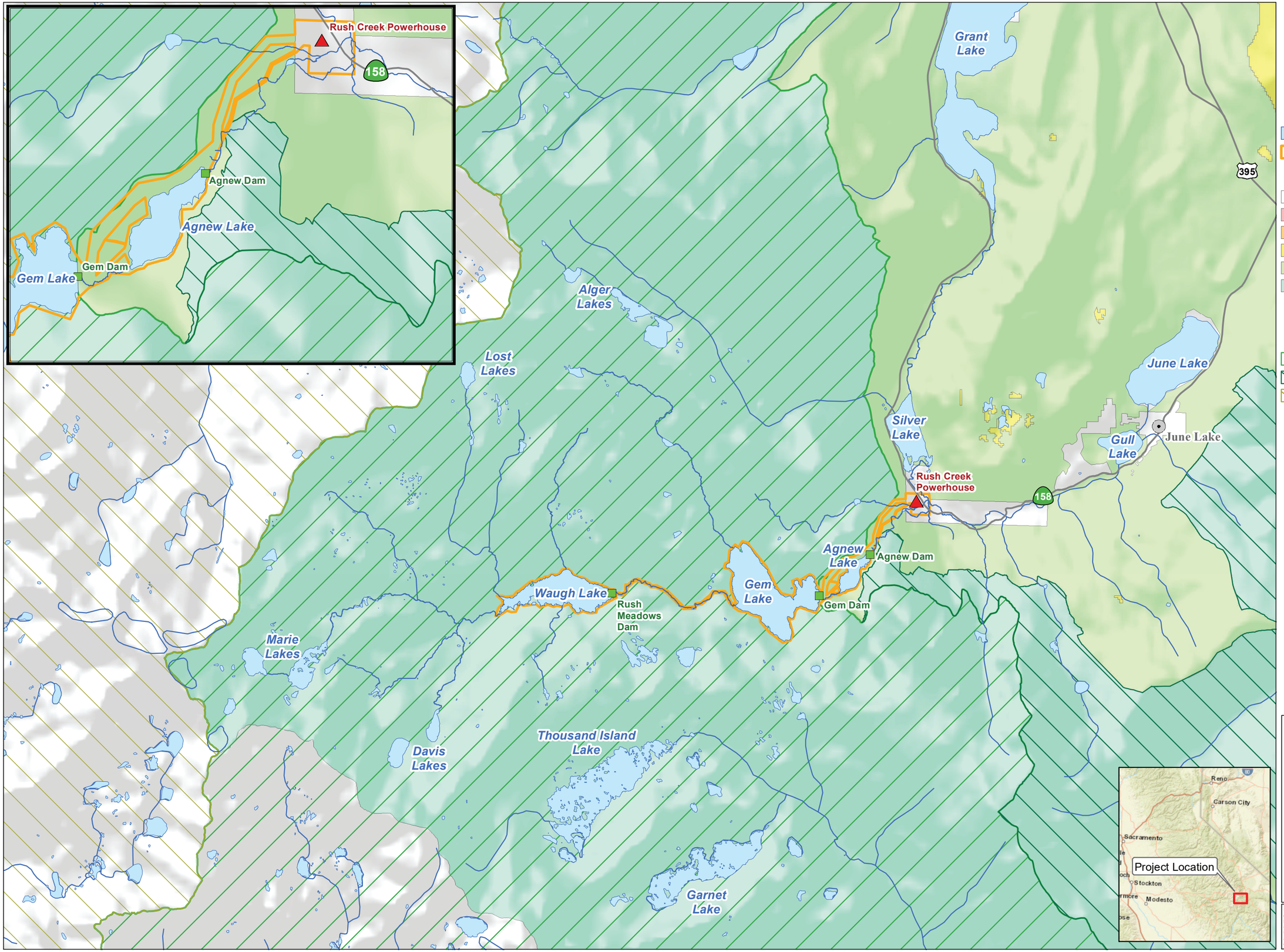
Project Facility	Land Ownership/ Jurisdiction	Scenic Integrity Objective (as applicable)
Agnew Dam Area		
Dams		
Agnew Dam	Forest Service	High
Reservoirs		
Agnew Lake	Forest Service	High
Flowline		
Agnew Dam to Agnew Junction Flowline	Forest Service	High
Valve House		
Agnew Junction (Valve House and Stand Pipe)	Forest Service	High
Agnew Dam Valve House	Forest Service	High
Stream Gages		
Rush Creek below Agnew Lake (USGS No. 10287289; SCE No. 357)	Forest Service	High
Reservoir Gages		
Agnew Lake (USGS No. 10287285; SCE No. 351)	Forest Service	High
Power Lines		
4 kV Rush Creek Powerhouse to Agnew Dam Power Line	Forest Service	High
4 kV Agnew Lake Dam Power Line	Forest Service	High
4 kV Upper Agnew Boat Dock Power Line (non-operational)	Forest Service	High
Communication Lines		
Communication Line from Agnew Hoist House to Agnew Boathouse	Forest Service	High
Trams and Hoist Houses		
Agnew Tram	Forest Service	High (the portion that is within Forest Service Jurisdiction)
Agnew Tram Hoist House	Forest Service	High
Agnew Tram Landing	Forest Service	High
Trails		
Agnew Stream Gage Access Trail	Forest Service	High
Agnew Dam/Lake Ancillary and Support Facilities		
Lower Agnew Lake Boathouse / Dock	Forest Service	High
Upper Agnew Lake Boathouse / Dock	Forest Service	High

Project Facility	Land Ownership/ Jurisdiction	Scenic Integrity Objective (as applicable)
Agnew Lake Motor Barge	Forest Service	High
Agnew Cabin	Forest Service	High
Agnew Weather Station	Forest Service	High
Agnew Flume (downstream of Agnew Dam)	Forest Service	High
Rush Creek Powerhouse Area		
Penstocks		
Agnew Junction to Rush Creek Powerhouse Penstock (No. 1)	SCE & Forest Service	High (the portion that is within Forest Service Jurisdiction)
Agnew Junction to Rush Creek Powerhouse Penstock (No. 2)	SCE & Forest Service	High (the portion that is within Forest Service Jurisdiction)
Powerhouse		
Rush Creek Powerhouse	SCE	NA
Gages		
Rush Creek Powerhouse (USGS No. 10287300; SCE No. 367)	SCE	NA
Transmission Lines		
2.4 kV Switchyard to Powerhouse Transmission Line	SCE	NA
Powerhouse Ancillary and Support Facilities		
Rush Creek Powerhouse Complex Access Road	SCE	NA
Cottages (2)	SCE	NA
Garages (4)	SCE	NA
Warehouse and Dock	SCE	NA
Machine Shop	SCE	NA
Pump House	SCE	NA
Woodshed (2)	SCE	NA
Helicopter Landing Site	SCE	NA
Tank (propane)	SCE	NA
Bridge over Powerhouse Tailrace	SCE	NA
Bridge over Rush Creek	SCE	NA

Source: Forest Service 2019

MAPS

This Page Intentionally Left Blank



SCE Facilities

- Dam
- Powerhouse

Other Features

- Highway
- River/Stream
- Lake/Reservoir
- FERC Boundary

Scenic Integrity Objectives*

- Non-Applicable
- Very Low
- Low
- Medium
- High
- Very High

*SOURCE: Inyo National Forest Land and Resource Management Plan, 2019

National Wilderness Areas

- Ansel Adams Wilderness
- Owens River Headwaters Wilderness
- Yosemite Wilderness

SOUTHERN CALIFORNIA EDISON®
An EDISON INTERNATIONAL® Company

Rush Creek Project (FERC 1389)

Map 4.12-1

Scenic Integrity Objectives in the Vicinity of the Rush Creek Project

0 0.5 1 Miles

Projection: UTM Zone 11
Datum: NAD 83

Date: 4/27/2021

C:\GIS\Cardno\30735240_SCE_EasternHydro\map\Rush Creek\LandMaps\SCE_RUSH_CREEK_SIO_Overview_17i11i_01.mxd

This Page Intentionally Left Blank

APPENDIX 4.12-A

Representative Photographs

This Page Intentionally Left Blank

Photo A-1. Rush Meadows Dam and Waugh Lake, High Water Level (looking west)

Photo A-2. Rush Meadows Dam and Waugh Lake, Low Water Level (looking west)

Photo A-3. Gem Dam, Gem Lake, and Ancillary Facilities below Dam, High Water Level (looking west)

Photo A-4. Gem Dam and Lake, Low Water Level (looking west)

Photo A-5. Gem Tram and Gem Dam as viewed from Agnew Lake (looking southwest)

Photo A-6. Agnew Dam and Lake, High Water Level (looking south)

Photo A-7. Agnew Dam and Lake (Low Water Level), Agnew Boathouse/Dock, and Agnew Tram and Hoist House (looking north)

Photo A-8. Agnew Tram Tracks and Rush Creek Powerhouse Complex in the Distance (looking east)

Photo A-9. Rush Creek Powerhouse and Switchyard (non-project facility) (looking west)

TABLE OF CONTENTS

LIST OF TABLES

LIST OF MAPS

LIST OF ACRONYMS

CFR	Code of Federal Regulations
CHRIS	California Historical Resources Information System
CRMP	Cultural Resources Management Plan
FERC	Federal Energy Regulatory Commission
Forest Service	United States Forest Service
HAER	Historic American Engineering Record
kV	Kilovolt
NAHC	Native American Heritage Commission
NRHP	National Register of Historic Places
OHP	California Office of Historic Preservation
Project	Rush Creek Project

RMAD	Rush Meadows Archaeological District
SCE	Southern California Edison Company
SHPO	State Historic Preservation Officer
TCL	Traditional Cultural Landscapes
TCP	Traditional Cultural Properties

4.13 CULTURAL RESOURCES

This section describes cultural resources in the vicinity of Southern California Edison Company's (SCE) Rush Creek Project (Project). The Federal Energy Regulatory Commission's (FERC) content requirements for this section are specified in Title 18 of the Code of Federal Regulations (CFR) Chapter I § 5.6(d)(3)(x).

This section provides: (1) an overview of the prehistoric, ethnographic, and historic setting for contextual purposes; (2) a description of the known cultural resources and historic properties within the FERC Project boundary and a quarter-mile record search area, including identification of properties that are listed on, or eligible for listing on, the National Register of Historic Places (NRHP); and (3) a discussion of Indian tribes that may attach religious and cultural significance to the historic properties and Traditional Cultural Properties (TCP) within the Project boundary and vicinity. In addition, this section summarizes SCE's current cultural resource management efforts. The resource information presented in this section is based primarily on research and surveys conducted by SCE for previous Project relicensing efforts and other related studies.

4.13.1 Information Sources

This section was developed using existing information available in the following primary documents. Additional references are cited in the text, as appropriate.

- California Historical Resources Information System (CHRIS) Eastern Information Center Records Search, received on March 16, 2021;
- Management Plan for Historic and Archaeological Resources Associated with the Rush Creek Hydroelectric Project, (FERC Project No. 1389), Mono and Inyo Counties, California (SCE 1990);
- Native American Heritage Commission (NAHC) Sacred Lands File for the Project, received on November 6, 2020 (NAHC 2020a); and
- NAHC Digital Atlas (2020b).

4.13.2 Setting

This subsection provides an overview of the prehistoric, ethnographic/ethnohistoric, and historic setting to situate the Project lands for contextual purposes.

4.13.2.1 Prehistoric Setting

Previous archaeological studies in the Sierra Nevada region near the Project include studies conducted by the United States Forest Service (Forest Service) for permitted stock use, designated stock camps, and trail maintenance activities in the Ansel Adams Wilderness. Additionally, the previous relicensing studies for the Project surveyed the FERC Project boundary and upper Rush Creek for the first time and recorded numerous prehistoric sites submerged within Waugh Lake. The historic archaeological sites

recorded were associated with the development and maintenance of the hydroelectric project. Archaeological work in the Mono Basin, Long Valley, and broader region has been summarized in several major overviews and studies by E.L. Davis (1964), Bettinger (1982), Busby et al. (1980), and Jackson's (1985) survey reports for timber compartments on the Inyo National Forest.

Prehistoric sites in the Sierra Nevada and Mono Lake region typically consist of sparse lithic scatters, focused obsidian tool manufacturing and quarry sites, seasonal hunting and pinyon pine harvesting camps, large habitation sites, and ceremonial sites with rock art. Within the Project, sites generally consist of obsidian scatters with tools, handstones, and milling equipment used for food preparation.

The following prehistoric chronology, based on time-sensitive projectile points, has been proposed by Bettinger (1982) for the Inyo-Mono region:

- Mohave complex (pre-3500 B.C.): Indicated by Mohave, Silver Lake, and Great Basin Transverse point assemblages.
- Little Lake Period (3500-1200 B.C.): Indicated by Little Lake and Pinto series points and Humboldt Concave-base bifaces.
- Newberry Period (1200 B.C.–A.D. 600): Indicated by Elko Series points.
- Haiwee Period (A.D. 600–1300): Indicated by Eastgate and Rose Spring Series points and Humboldt Basal Notched bifaces.
- Marana Period (A.D. 1300–historic): Indicated by Cottonwood and Desert Sidenotched points.

Historic-era sites in this region generally consist of refuse scatters and features associated with the historic hydroelectric project.

4.13.2.2 Ethnographic/Ethnohistoric Setting

The Project is located near the headwaters of Rush Creek in the Sierra Nevada at the juncture of three major watersheds: Rush Creek Watershed, San Joaquin River Watershed, Merced River Watershed, and the Mono Basin and Long Valley geographical areas. Ethnographic and Native American tribal territories generally follow these geographical boundaries but also overlap via trade and travel routes and seasonal hunting and resource gathering areas. Refer to Map 4.13-1 for a depiction of the regional watersheds and tribal territory/ranges.

The Rush Creek Watershed originates at an important pivot point in the Sierra at Mount Lyell (13,114 feet in elevation). The area is a juncture of many distinct watersheds and Native American territories and ranges. From this high point northeast toward Donahue Pass, the Rush Creek Watershed originates and heads east toward Mono Lake. Prior to hydroelectric development, Rush Creek meandered through Rush Meadow (now Waugh Lake) and dropped in elevation through a series of glacial lakes (now Gem Lake and

Agnew Lake) before it dropped dramatically to Silver Lake. June Lake, Gull Lake, and Reversed Creek feed Silver Lake in addition to Rush Creek. Waters in this basin flow north toward Grant Lake, Lower Rush Creek, and eventually Mono Lake and into areas traditionally and currently occupied by the Kukzadika'a Paiute (Davis 1964). The Kukzadika'a speak a Mono dialect of the Northern Paiute language, which is a member of the Numic branch of the Uto-Aztecan language family. It is spoken across the Great Basin in the western United States from Mono Lake through western Nevada and into southeastern Oregon and southwestern Idaho (Golla 2011; U.C. Berkeley 2019).

North from Mount Lyell and Donahue pass stretches Lyell Canyon, Tuolumne Meadows and the headwaters of the Merced River, as well as the traditional and current territories of the Southern Sierra Miwuk, Central Sierra Me-Wuk[1] and Washo (NAHC Digital Atlas 2020b, personal communication Shelly Davis-King 2021). The Southern Sierra Miwuk language was traditionally spoken in the foothills of the Sierra Nevada between the Merced and Chowchilla Rivers. Southern Sierra Miwuk is a Miwokan language, most closely related to Central Sierra Me-Wuk and Northern Sierra Mi-Wuk. The Miwokan languages are part of the Penutian language family (Levy 1978; U.C. Berkeley 2019).

Washo came down into Virginia Canyon in Yosemite, almost to Tuolumne Meadows. Their name for Tuolumne Meadows is "Me-Wuk Water or Stream" and when they visited the Tuolumne River area of Yosemite it was at the invite of the Me-Wuk (personal communication Shelly Davis-King 2021).

The Ritter Range to the south of Mount Lyell, including prominent peaks Banner and Ritter, contribute snowmelt to the North and Middle Forks of the San Joaquin River, which are part of the traditional homeland of the Western Mono (Nim) (NAHC Digital Atlas 2020b; Goode 2020). The Mono language was traditionally spoken from Mono Lake to the south and west. Most linguists distinguish two main varieties of the language – Eastern Mono (also called Owens Valley Paiute) is spoken in the Owens River Valley and Western Mono is spoken on the western side of the Sierra Nevada, in the San Joaquin River, Kings River, and Kaweah River watersheds. Mono is a member of the Numic branch of the Uto-Aztecan language family (Golla 2011; U.C. Berkeley 2019) (Map 4.13-1).

On the eastern side of the Sierra Nevada, Owens Valley Paiute long-term settlements were established near seasonal and perennial water sources (Steward 1938), while short-term, seasonal camps were used for gathering pinyon nuts and hunting. Family groups were organized into districts, and the controlling village or villages organized communal activities (e.g., hunting, pinyon gathering) and defense of their territory under the leadership of a headman (Busby et al. 1980; Steward 1938).

Several important obsidian quarries are located in Long Valley, east of the town of Mammoth Lakes and south of the Project; these were utilized and traded widely prior to the introduction of metal tools by Euroamericans. A variety of food resources are also found throughout this region such as Tui chub, speckled dace, Owens Valley sucker,

[1] The similarity in English pronunciation of Me-Wuk and Miwuk should not be construed to be a minor spelling variation, as each has linguistic relevance being a separate language. Each stands alone, the former used by the Central Sierra Me-Wuk and the latter used by the Southern Sierra Miwuk.

kutsavi (brine fly larvae from Mono Lake), piuga (Pandora moth caterpillar), rabbits, small game, deer, antelope, pinyon pine nuts, roots and greens. There is ethnographic and archaeological evidence that these items, plus many more, were traded extensively with the Nim, Yokuts, and Sierra Miwok groups on the western side of the Sierra Nevada (Steward 1930, 1933, 1934, 1938; Davis 1964, 1965; Stewart 1939, 1941; Gifford 1932; Hall 1983).

On the western slopes of the Sierra Nevada in the foothills, semi-permanent settlements or winter villages of the Sierra Miwok were clustered along the river drainages – Central Sierra Miwok along the Stanislaus and Tuolumne drainages, and Southern Sierra Miwok along the Merced and Fresno drainages. The Western Mono occupied the foothills surrounding the San Joaquin River, Kings River, and Kaweah River watersheds (Levy 1978). All groups participated in extensive east-west trade networks connected by trails traversing the Sierra Nevada Range and extending to the Pacific Ocean to the west as well as east into the Great Basin. Salt and obsidian moved westward, and marine shell and steatite moved eastward, basketry was traded in both directions (Steward 1930, 1933, 1934, 1938; Davis 1964, 1965; Stewart 1939, 1941; Gifford 1932; Hall 1983). The ethnographic literature suggests that TCPs or Traditional Cultural Landscapes (TCL) related to seasonal summer camps, hunting and resource gathering and travel routes may be located within or surrounding the Project; however, to date no TCPs or TCLs have been identified in the Project.

4.13.2.3 Historic-Era Setting

Regional Development

The first Euroamerican party to enter the Mono Basin region was likely the Joseph Rutherford Walker expedition, who briefly passed through to expand the fur trade west of the Rocky Mountains. They crossed the Sierra Nevada north of Yosemite Valley in 1839. Prospecting and mining in the eastern Sierra Nevada began later in the 1850s. Miner Leroy Vining and his brother, Richard, came to the Mono Basin in the fall of 1852. They returned to Mariposa empty handed, but returned in September 1857 to mine at Downtown, just north of the Mono Basin. Gold was first mined successfully along the northern edge of the Mono Lake Basin at Mono Diggings (just east of Conway Summit). Prospects were also developed in Lundy Canyon (the Homer Mining District), at Bennettville near Tioga Pass and west of Lee Vining on the hills overlooking the lake (Log Cabin Mine). The Bodie Mine, north of Mono Lake had the greatest success in the region at its peak (8,000 residents) between 1879 and 1881. Settlers established ranches and farms within the Mono Basin to serve the mining towns, especially Bodie, with food and fiber products. Agricultural family names included Conway, DeChambeau, Farrington, Mattly, Nay, Sylvester, Thompson, and the McPhersons (who had a ranch on Paoha Island in the middle of Mono Lake). They raised livestock and grew vegetable crops, battling the region's challenging short growing season. Many Mono Lake Paiute worked on the ranches and in the mines and took the names of their new Euroamerican employers. Mono Mills, south of Mono Lake, provided needed timber and firewood, which reached Bodie using a steam ship that crossed the lake, and transferred their loads onto wagons. Numerous Mono Lake Paiute lived and worked at Mono Mills as well, notably

Augie Hess born at Mono Mills in 1914, but they maintained traditional gathering practices, including harvesting kutsavi (brine fly larvae from Mono Lake), pinyon pine nuts, piuga (Pandora moth caterpillar) as well as traveling the long-established trade routes (Mono Basin History Museum 2020).

Los Angeles Department of Water and Power worked from 1934 to 1941 on the Mono Extension of the Los Angeles Aqueduct (LA Aqueduct) to tap four of Mono Lake's tributary streams, including lower Rush Creek. Construction camps were set up along lower Rush Creek to build the aqueduct through the Mono Craters, which diverted water south to the Owen's River instead of allowing its natural course to Mono Lake. This system was part of an ongoing integration of the Eastern Sierra's into California's water and energy framework, as discussed further below in relation to hydroelectric development.

Early Hydroelectric Development

While the hydroelectric development that transformed California in the late nineteenth and early twentieth centuries centered upon the more abundant watersheds of the western slope of the Sierra Nevada Range, by the 1890s the Sierra's eastern slope had also attracted entrepreneurial interest with its precipitous slopes and high elevation hydrology. By 1892, the Standard Consolidated Mining Company developed the Green Creek Power Plant to supply electricity for Bodie's expansive mining operations. The plant was supplied by snowmelt from Castle Peak (Dunderberg Peak), and generated a groundbreaking 3,000 volts of electricity that was carried nearly 13 miles to the stamp-mills of Bodie. Establishment of the plant proved the viability of alternating current electricity for mining and industrial operations in California's eastern slope and provided a foundation for subsequent development of additional hydroelectric capacity in the region. This process was paralleled across California during the period, with hydroelectric development a defining feature of the state's economic, social, and physical development from the 1890s through the 1920s (Williams and Hicks 1989).

Following the success of the Green Creek Plant, Bodie entrepreneur and businessman James Stuart Cain laid the groundwork for establishment of additional hydroelectric generation on the east side. Cain and partner R.T. Pierce claimed appropriation rights on the waters of Rush Creek and Lee Vining Creek, and purchased a number of ranches and landholdings in the Mono Basin. By 1907, Cain had gained control of the California-Nevada Canal, Water and Power Company. Additionally, Cain received rights-of-way on public land to construct reservoirs on Rush Creek at Gem and Agnew lakes, as well as, the right to build numerous ditches and flumes. In addition to his plans at Rush Creek, Cain laid the groundwork for development on Lee Vining Creek (Williams and Hicks 1989).

In 1911, Cain founded the Pacific Power Company to spearhead construction of the planned power plants, including at Rush Creek. By 1915, the firm had been reorganized as Pacific Power Corporation, which in turn was acquired by Nevada-California Electric Corporation in 1917. The hydroelectric system at Rush Creek was constructed between 1915 and 1917 and initially included two dams, Gem Dam and Agnew Dam, associated water conveyance flowlines, and a single powerhouse with two 8,000 horsepower

turbines. Electricity from the plant was relayed from the system via a 95 kilovolt (kV) transmission line. In 1918, Rush Meadows Dam was added to provide additional water storage, with the 30-foot-high structure raised again in 1925 to its present 50-foot height. While the system was of a standard capacity for the period, it was noteworthy for its substantial vertical head, with the 1,810-foot drop from reservoir to power plant being the fourth highest developed at the time of construction (Williams and Hicks 1989).

Through the twentieth century, there were few notable operational changes to the Rush Creek Hydroelectric System, with the Project features largely operating as designed. During this period, however, ownership of the system passed through a number of entities, in keeping with the economic and organizational consolidation that characterized the twentieth century utility sector. In 1923, Nevada-California Electric Corporation ceded ownership of Rush Creek Hydroelectric Project to its subsidiary, Southern Sierras Power Company. In 1936, Southern Sierras Power Company was dissolved, and its operating properties were transferred back to the parent company, Nevada-California Electric Corporation, which subsequently changed its name to California Electric Power Company (Calectric) as part of ongoing reorganization. By 1964, Calectric had merged with SCE, who continues to operate the Rush Creek Hydroelectric Project (Williams and Hicks 1989).

As an operating early twentieth century hydroelectric system, the Rush Creek Hydroelectric Project is representative of a significant era in the development of California's eastern Sierra Nevada. While not the first hydroelectric system in the region, the Project embodies distinctive design and engineering innovations that did much to shape the economic and physical development of the surrounding region.

4.13.3 Known Cultural Resources

Areas located within the FERC Project boundary were surveyed for cultural resources between 1985 and 1989 as part of the previous relicensing effort (SCE 1990). Additionally, several studies since relicensing have documented cultural resources in the FERC Project boundary. The results of these efforts are summarized in the following subsections. Additional and more detailed information regarding previously documented cultural resources is available in the Management Plan for Historic and Archaeological Resources Associated with the Rush Creek Hydroelectric Project, (FERC Project No. 1389), Mono and Inyo Counties, California (SCE 1990).

4.13.3.1 Archaeological Resources

Fourteen archaeological resources have been identified within a 0.25-mile radius of the Project. All of these properties are located within the FERC Project boundary. Five of the 14 resources have been previously determined not eligible for the NRHP (California Office of Historic Preservation [OHP] letter March 7, 1989). One resource, a historic tree blaze has not been evaluated for the NRHP. The remaining eight resources are prehistoric sites located within and surrounding Waugh Lake, which were recommended as eligible by David White as part of the SCE's previous relicensing study. The OHP concurred with these findings in 1989 (OHP letter February 6, 1990), however did not concur with the

recommendation that these sites are also part of a Rush Meadows Archaeological District (RMAD) (OHP letter March 13, 1989). Archaeological excavations and data recovery occurred at ten sites located within and surrounding Waugh Lake in 1996 and 1998 (see Jackson 1997 and 1999) for the "Archaeological Data Recovery Program-Rush Meadow", which was prescribed in the Historic and Archaeological Preservation Plan (White 1989). During this investigation numerous sites were combined and reevaluated. Four sites within and surrounding Waugh Lake were found to contain important data including paleo botanical data that would qualify them for listing in the NRHP. These recommendations were never submitted to the OHP for concurrence or updated in the Cultural Resources Management Plan (CRMP) for the Project. See Table 4.13-1 for details.

All archaeological sites located within the FERC Project Boundary are listed in Table 4.13-1 and Map 4.13-2 (confidential) depicts the locations of these sites.

4.13.3.2 Historic-Era Resources

As part of the previous relicensing studies, SCE evaluated most facilities associated with the Rush Creek Hydroelectric Project to determine the system's eligibility for the NRHP. The evaluation methods and results are documented in the "Evaluation of the Historic Resources of the Lee Vining Creek (FERC Project No. 1388) and Rush Creek (FERC Project No. 1389) Hydroelectric Systems, Mono County, California" (Williams and Hicks 1989).

Based on the evaluation undertaken, the Rush Creek Hydroelectric Project includes a hydroelectric-themed NRHP Historic District, the Rush Creek Hydroelectric System Historic District. The State Historic Preservation Officer (SHPO) concurred with this finding by letter dated September 27, 1989 (SHPO Reference No. FERC821004D and FERC880816A). As documented, the historic district included seven contributing structures and six contributing buildings. Additionally, 30 built environment resources were evaluated as non-contributing to the district and ineligible for listing in the NRHP. All contributing and non-contributing built environment resources are listed in Table 4.13-2 and Map 4.13-2 (confidential) depicts the locations of the NRHP-eligible contributing resources.[2]

As documented in the evaluation, the Rush Creek Hydroelectric System qualifies as a significant resource under the primary theme of economic industrial history. The system was deemed eligible to the NRHP under Criterion A, broad patterns of history, and Criterion C, distinctive characteristics of the type, period, and method of construction that represent the work of a master. The period of significance was documented as 1915 to 1925, the period in which the system was built and expanded with the addition of Rush Meadows Dam. Within this period, the system is significant for its position in the development of hydroelectric generation on the eastern slope of the Sierra Nevada and its nationally distinctive engineering characteristics. It is an intact example of a high-head, impulse water wheel, high-voltage hydroelectric generation plant. While not the first hydroelectric plant in the region, it embodies distinctive innovations in dam construction

[2] The following eligible resources related to the Rush Creek Hydroelectric System Historic District have been removed from the Project since initial documentation and are no longer extant: Cottages 103, 104, 105 and Clubhouse 108.

and powerhouse planning which maximized the plant's production of hydroelectricity. Some of the buildings which make up the plant possess architectural significance, although these historical values are of secondary importance to the broader theme of economic and industrial history.

In addition to the Rush Creek Hydroelectric System Historic District, two additional built environment resources have been previously documented as ineligible for the NRHP in the FERC Boundary: Baker Cabin Site (no OHP concurrence documentation located) and Agnew 4 kV Circuit (SHPO Reference No. FERC110112A). No additional built environment documentation has been undertaken within the FERC Project boundary.

4.13.4 Tribal Interests and Traditional Cultural Properties

No federally recognized tribal lands are located within or near the FERC Project boundary. However, as discussed in Section 4.13.2.1, the Project is located in areas likely used traditionally by the Kutzadika'a Paiute, Nim, Southern Sierra Miwuk, Central Sierra Me-Wuk and Owens Valley Paiute. To date, specific resources of tribal interest have not been identified within the FERC Project boundary or the immediate vicinity (NAHC 2020a). In addition, SCE is not aware of any TCPs or TCLs in the immediate vicinity of the Project.

4.13.5 Current Cultural Resource Management

SCE prepared a CRMP for the Rush Creek Project in 1990, "Management Plan for Historic and Archaeological Resources Associated with the Rush Creek Hydroelectric Project, (FERC Project No. 1389), Mono and Inyo Counties, California," (SCE 1990). The CRMP identifies specific measures that SCE undertakes to avoid adverse effects to NRHP-eligible cultural resources in the FERC Project boundary. The CRMP identifies various programmatic measures that SCE is required to implement, as well as resource monitoring and required data recovery efforts. Resource monitoring and recordation is required to occur in 3- to 5-year increments to determine the success of current measures and to evaluate the need for additional treatment. The CRMP requires that if effects to NRHP-eligible properties cannot be avoided with implementation of protective and avoidance measures, SCE, in consultation with SHPO and FERC, shall address any effects in accordance with 36 CFR Part 800.

4.13.6 References

Bettinger, Robert L. 1982. Archaeology East of the Range of Light: Aboriginal Human Ecology of the Inyo-Mono Region of Central Eastern California. Monographs in California and Great Basin Anthropology 1. Davis, California.

Busby, Colin I., John M. Findlay, and James C. Bard. 1980. A Cultural Resource Overview of the Bureau of Land Management Coleville, Bodie, Benton, and Owens Valley Planning Units, California. Cultural Resources Publications, Bureau of Land Management, Bakersfield, California.

CHRIS (California Historical Resources Information System) Eastern Information Center Records Search. March 2021.

Davis, Emma Lou. 1964. An Archaeological Survey of the Mono Basin and Excavations of Two Rockshelters, Mono County, California. University of California Archaeological Survey Annual Report 1963-1964: 251-392. Los Angeles.

———. 1965. An Ethnography of the Kuzedika Paiute of Mono Lake, Mono County, California. University of Utah Anthropological Papers 8:1-56.

Davis-King, Shelly. 2021. Personal Communication.

Gifford, E. W. 1932. The Northfork Mono. University of California Publications in American Archaeology and Ethnology 31(2):15-65. Berkeley.

Golla, Victor. 2011. California Indian languages. Berkeley, CA: University of California Press.

Goode, R.W. 2020. The North Fork Mono Trail, Nium Trail Network. Original Segment Published in Water Stores I, Tribal Water Summit 2009. Updated 2020.

Hall, Matthew C. 1983. Late Holocene Hunter-Gatherers and Volcanism in the Long Valley-Mono Basin Region: Prehistoric Culture Change in the Eastern Sierra Nevada. Ph.D. dissertation, Department of Anthropology, University of California, Riverside.

Jackson, Robert J. 1985. An Archaeological Survey of the Wet, Antelope, Railroad, and Ford Timber Sale Compartments in the Inyo National Forest. MS on file, Inyo National Forest, Bishop, California.

Jackson, Thomas. 1997. Archaeological Data Recovery Program- Rush Meadow. Investigations at CA-MNO-2440/H, MNO-2459, MNO-2460, MNO-2461 and MNO-2463. Report on file at Southern California Edison, Rosemead, California.

———. 1999. Archaeological Data Recovery Program Rush Meadow Archaeological District, Ansel Adams Wilderness, Inyo National Forest, California. Report on file at Southern California Edison, Rosemead, California.

Levy, R. 1978. Eastern Miwok. In California. Robert F. Heizer (editor). 398-413 pp. Handbook of North American Indians Vol. 8, William G. Sturtevant (editor). Washington, D.C.: Smithsonian Institution.

Mono Basin History Museum. Available at https://www.monobasinhistory.org/history/. Accessed December 2, 2020.

NAHC (Native American Heritage Commission). 2020a. Response to Sacred Lands File Request, Rush Creek Hydroelectric Project, Mono County, California. November 2020.

———. 2020b. NAHC Digital Atlas. Available at: https://native-land.ca.

OHP (California Office of Historic Preservation). 2012. Archeological Determinations of Eligibility, Mono County. On file at Southern California Edison, Rosemead, CA.

SCE (Southern California Edison Company). 1990. Management Plan for Historic and Archaeological Resources Associated with the Rush Creek Hydroelectric Project, (FERC Project No. 1389), Mono and Inyo Counties, California. April 1990.

———. Multiple Dates. Historic American Engineering Record (HAER), Rush Creek Hydroelectric System, HAER CA-166. On file, Library of Congress, accessed November 10, 2020 at https://www.loc.gov/pictures/search/?q=HAER+CA+166&fa=displayed%3Asurveys_only&sp=1&co=hh.

Steward, Julian H. 1930 Irrigation without Agriculture. Papers of the Michigan Academy of Science, Arts, and Letters 12:149-156.

———. 1933. Ethnography of the Owens Valley Paiute. University of California Publications in American Archaeology and Ethnology 34(5):355-440. Berkeley.

———. 1934. Two Paiute Autobiographies. University of California Publications in American Archaeology and Ethnology 33:428-438. Berkeley.

———. 1938. Basin-Plateau Aboriginal Sociopolitical Groups. Bureau of American Ethnology Bulletin 120. Smithsonian Institution, Washington, D.C.

Stewart, Omer C. 1939 The Northern Paiute Bands. University of California Anthropological Records 2(3). Berkeley.

———. 1941. Culture Element Distributions XIV: Northern Paiute. University of California Anthropological Records 4(3):361-446. Berkeley.

U.C. Berkley (University of California, Berkeley). 2019. Survey of California and Other Indian Languages, Department of Linguistics, Berkeley, California.

White, David. 1989. An Evaluation of National Register Eligibility for Three Historic Archaeological Sites at Waugh Reservoir, Mono County, California; Historic and Archaeological Preservation Plan for the Rush Creek Hydroelectric Project (FERC Project 1389). On file at Southern California Edison, Rosemead, California.

———. 1994. Discussion Document for an Archaeological Data Recovery Program at Rush Meadow, Mono County, California. On file at Southern California Edison, Rosemead, California.

Williams, James C., Hicks, Robert A. 1989. Evaluation of the Historic Resources of the Lee Vining Creek (FERC Project No. 1388) and Rush Creek (FERC Project No. 1389) Hydroelectric Systems, Mono County, California. Submitted to Environmental Affairs Division, Southern California Edison Company, Rosemead, California. July 1989.

TABLES

This Page Intentionally Left Blank

Table 4.13-1. Previously Recorded Archaeological Resources within the FERC Project Boundary

Primary No.	Trinomial	Forest Service No.	Site Type	Site Eligibility	Jackson (1996/1998) Recommended Eligibility Post Excavations
P-26-000430	CA-MNO-430/H	FS-05-04-51-1146	Prehistoric obsidian scatter and historic mining or quarry site likely associated with construction of Rush Meadows Dam	Not eligible; OHP concurrence 03/07/89	N/A
P-26-2438/P-26-002439/ P-26-002443	CA-MNO-2438H/ CA-MNO-2439H/ CA-MNO-2443H	FS-05-04-51-1143/ FS-05-04-51-1148	Prehistoric obsidian flake scatter, historic camp and Historic bridge remains and retaining wall below Rush Meadows Dam	Not eligible; OHP concurrence 03/07/89	N/A
P-26-002440	CA-MNO-2440/H	FS-05-04-51-1144	Prehistoric obsidian flake scatter, cryptocrystalline silicate debitage, flaked tools, milling equipment, and in situ tephra layer. Historic elements consist of cut stumps from construction of the reservoir	Eligible; (did not find OHP concurrence)	Excavated in 1996 and 1998 and found to contain data potential including important paleo botanical data for eligibility under Criterion D (no SHPO concurrence)
P-26-002441	CA-MNO-2441	FS-05-04-51-1145	Prehistoric obsidian flake scatter and in situ tephra layer	Not eligible; OHP concurrence 09/22/88	Data potential exhausted through data recovery in 1998, recommended not eligible (no SHPO concurrence)
P-26-00723/ P-26-002442	CA-MNO-723/ CA-MNO-2442	FS-05-04-51-1147	Prehistoric obsidian flake scatter and flaked tools	Eligible; OHP concurrence 03/07/89	Data potential exhausted through data recovery in 1998, recommended not eligible (no OHP concurrence)
P-26-002458	CA-MNO-2458	FS-05-04-51-1173	Prehistoric obsidian flake scatter, flaked tools and granite handstone	Eligible; OHP concurrence 08/01/89	Excavated in 1998 and found to contain data potential including important paleo botanical data for eligibility under Criterion D (no OHP concurrence)
P-26-002459	CA-MNO-2459	FS-05-04-51-1174	Prehistoric obsidian scatter	Eligible; OHP concurrence 08/01/89	Data potential exhausted through data recovery in 1996, recommended not eligible (no OHP concurrence)

Primary No.	Trinomial	Forest Service No.	Site Type	Site Eligibility	Jackson (1996/1998) Recommended Eligibility Post Excavations
P-26-002460	CA-MNO-2460	FS-05-04-51-1175	Prehistoric obsidian scatter and flaked tools	Eligible; OHP concurrence 08/01/89	Excavated in 1996 and found to contain data potential including important paleo botanical data for eligibility under Criterion D (no OHP concurrence)
P-26-002461	CA-MNO-2461/H	FS-05-04-51-1176	Prehistoric obsidian scatter and flaked tools	Eligible; OHP concurrence 08/01/89	Data potential exhausted through data recovery in 1996, recommended not eligible (no OHP concurrence)
P-26-002462	CA-MNO-2462	FS-05-04-51-1171	Prehistoric obsidian scatter and flaked tools	Eligible; OHP concurrence 08/01/89	Excavated in 1998 and found to contain data potential including important paleo botanical data for eligibility under Criterion D (no OHP concurrence)
P-26-002463	CA-MNO-2463	FS-05-04-51-1172	Prehistoric obsidian scatter and flaked tools	Eligible; OHP concurrence 08/01/89	Data potential exhausted through data recovery in 1996, recommended not eligible (no OHP concurrence)
P-26-004157			Historic can scatter	Not eligible; OHP concurrence 02/08/11	N/A
P-26-004158			Historic can scatter	Not eligible; OHP concurrence 02/08/11	N/A
P-26-004619		FS-05-04-51-1464	Historic arbor glyph	Unevaluated	N/A

Notes: OHP = Office of Historic Preservation

Table 4.13-2. Built Environment Cultural Resources in the Rush Creek Hydroelectric Project

Resource Name	Building Number	Construction Date	NRHP Evaluation Status[1]
Rush Creek Powerhouse	0101	1915-1916	Contributing, Rush Creek Hydroelectric System Historic District
Transformer Shop	0109	1915-1916	Contributing, Rush Creek Hydroelectric System Historic District
Superintendent House	0106	1929	Non-Contributing, Rush Creek Hydroelectric System Historic District
Cottage	0117	1928	Non-Contributing, Rush Creek Hydroelectric System Historic District
Pumphouse	0110	unknown	Non-Contributing, Rush Creek Hydroelectric System Historic District
Garage	0112	1929	Non-Contributing, Rush Creek Hydroelectric System Historic District
Garage	0113	Unknown	Non-Contributing, Rush Creek Hydroelectric System Historic District
Garage	0114	1929	Non-Contributing, Rush Creek Hydroelectric System Historic District
Woodshed	0115	1922	Non-Contributing, Rush Creek Hydroelectric System Historic District
Gas Pumps	0117	1926	Non-Contributing, Rush Creek Hydroelectric System Historic District
Woodshed	0120	1952	Non-Contributing, Rush Creek Hydroelectric System Historic District
Warehouse and Dock	0121	1954	Non-Contributing, Rush Creek Hydroelectric System Historic District
Machine Shop	0123	1959	Non-Contributing, Rush Creek Hydroelectric System Historic District
Woodshed	0124	1929	Non-Contributing, Rush Creek Hydroelectric System Historic District
Garage (3 car)	0125	1954	Non-Contributing, Rush Creek Hydroelectric System Historic District
Agnew Penstocks and Flowline		1916-1917	Contributing, Rush Creek Hydroelectric System Historic District
Valve House		1950	Non-Contributing, Rush Creek Hydroelectric System Historic District
Agnew Trams (Incline Railroad)		1915	Contributing, Rush Creek Hydroelectric System Historic District
Hoist House		1951	Non-Contributing, Rush Creek Hydroelectric System Historic District
Agnew Lake Dam		1915-1916	Contributing, Rush Creek Hydroelectric System Historic District
Cottage	0104	1955	Non-Contributing, Rush Creek Hydroelectric System Historic District

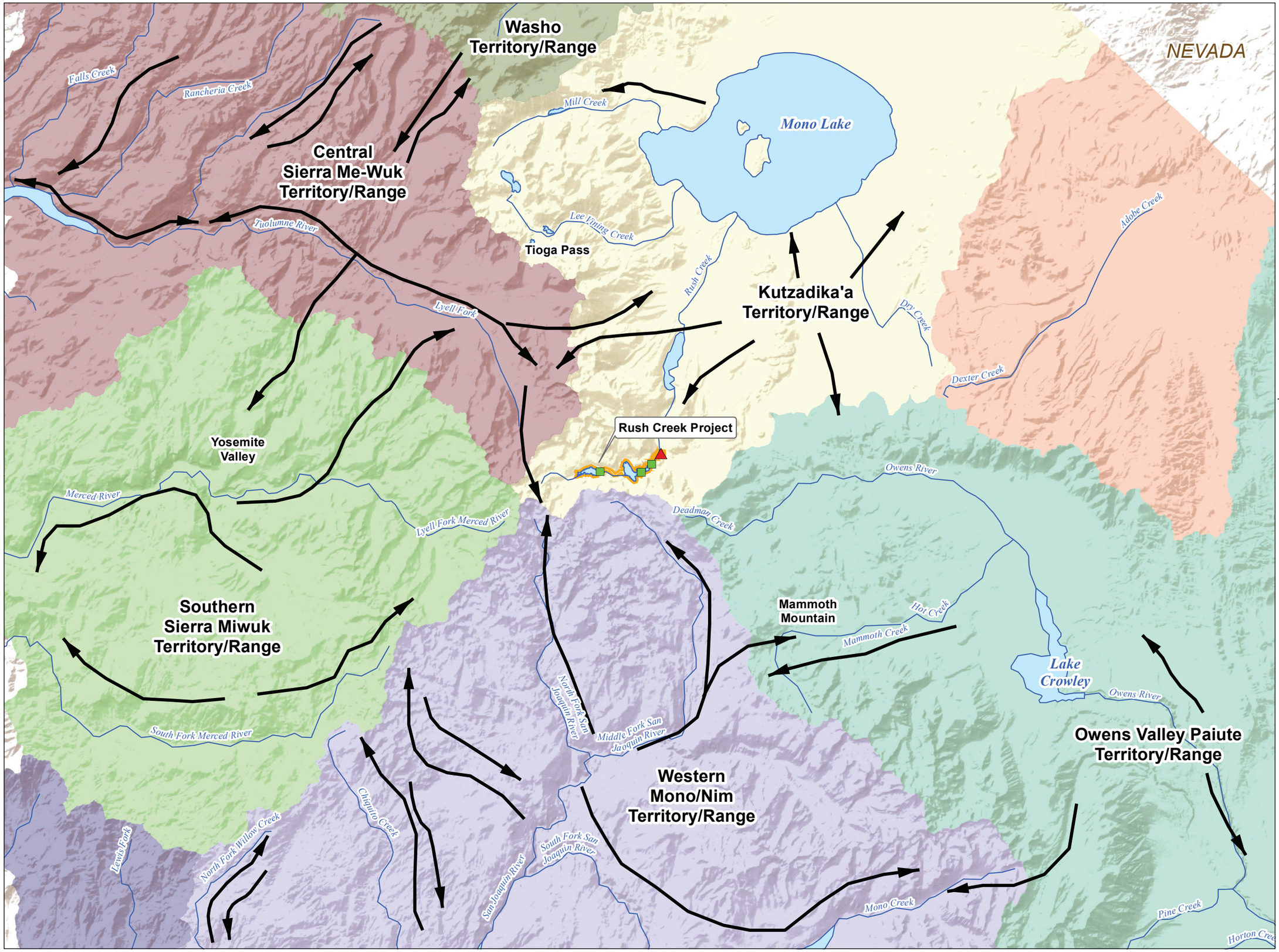
Resource Name	Building Number	Construction Date	NRHP Evaluation Status[1]
Dam Meter House		1966	Non-Contributing, Rush Creek Hydroelectric System Historic District
Agnew Lake Dock and Tool Shed		1960	Non-Contributing, Rush Creek Hydroelectric System Historic District
Gem Lake Dam		1915-1916	Contributing, Rush Creek Hydroelectric System Historic District
Gem Penstock, Flowline, and Tunnel		1916-1917	Contributing, Rush Creek Hydroelectric System Historic District
Valve House		unknown	Non-Contributing, Rush Creek Hydroelectric System Historic District
Weir		1950	Non-Contributing, Rush Creek Hydroelectric System Historic District
Weir		1957	Non-Contributing, Rush Creek Hydroelectric System Historic District
Bunkhouse	0102	1932	Non-Contributing, Rush Creek Hydroelectric System Historic District
Warehouse	0105	1957	Non-Contributing, Rush Creek Hydroelectric System Historic District
Cabin	0103	1938	Non-Contributing, Rush Creek Hydroelectric System Historic District
Cottage	0101	1945	Non-Contributing, Rush Creek Hydroelectric System Historic District
Cook's Shower		unknown	Non-Contributing, Rush Creek Hydroelectric System Historic District
Aerial Freight Tram	0104	1950 (tram), 1945 (building)	Non-Contributing, Rush Creek Hydroelectric System Historic District
Agnew Lake Dock		1950s	Non-Contributing, Rush Creek Hydroelectric System Historic District
Gem Tram (Incline Railroad)		1915	Contributing, Rush Creek Hydroelectric System Historic District
Rush Meadow Dam		1918 and 1925	Contributing, Rush Creek Hydroelectric System Historic District
Instrument Building		1950s	Non-Contributing, Rush Creek Hydroelectric System Historic District
Shed		1950s	Non-Contributing, Rush Creek Hydroelectric System Historic District
Agnew 4 kV Circuit P-26-006158		1931	Ineligible for the NRHP, OHP concurrence 02/08/11
Baker Cabin P-26-003092 CA-MNO-3037 FS-05-04-51-1258		Unknown	Unevaluated for the NRHP

Notes: NRHP = National Register of Historic Places
OHP = California Office of Historic Preservation

[1] The following eligible resources related to the Rush Creek Hydroelectric System Historic District have been removed from the Project since initial documentation and are no longer extant: Cottages 103, 104, 105 and Clubhouse 108.

MAPS

This Page Intentionally Left Blank



SCE Facilities

- Dam
- Powerhouse
- FERC Boundary

Other Features

- Highway
- River/Stream
- Lake

Watershed Boundaries

- Adobe
- Ahwahnee
- East Walker River
- Merced River
- Mono
- Owens
- San Joaquin River
- Tuolumne River

Tribal Territory/Range

- Approximate Movement Between Groups

SOUTHERN CALIFORNIA EDISON®
An EDISON INTERNATIONAL® Company

Rush Creek Project (FERC 1389)

Map 4.13-1

Regional Watersheds and Tribal Territory/Range

0 2.5 5 Miles

Projection: UTM Zone 11
Datum: NAD 83

Date: 5/18/2021

C:\GIS\Cardno\30735240_SCE_EasternHydro\map\Rush Creek\Cultural Maps\SCE_RUSH_CREEK_Wshed_TribalTerritories_17i11i_01.mxd

This Page Intentionally Left Blank

CONFIDENTIAL INFORMATION

The following map is being withheld from public disclosure in accordance with applicable regulations. It contains details on the locations of sensitive cultural resources, and qualifies as Confidential Information (36 CFR § 800.11(c)(1)). Disclosure of such information could be harmful to these resources. To further understand FERC's regulations regarding confidential filings visit: https://www.ferc.gov/enforcement-legal/foia.

Map 4.13-2. Previously Recorded Archaeological Resources within the FERC Project Boundary (Confidential)

Map 4.13-2 will not be distributed to the general public. Documents containing Confidential Information may be requested by entities and organizations with jurisdiction over these resources. To request copies, please contact Matthew Woodhall, SCE Relicensing Project Manager at (909) 362-1764 or matthew.woodhall@sce.com.

This Page Intentionally Left Blank

TABLE OF CONTENTS

LIST OF MAPS

LIST OF ACRONYMS

BIA	United States Bureau of Indian Affairs
CFR	Code of Federal Regulations
FERC	Federal Energy Regulatory Commission
NAHC	Native American Heritage Commission
NRHP	National Register of Historic Places
Project	Rush Creek Project
SCE	Southern California Edison Company
SLF	Sacred Lands File
TCP	Traditional Cultural Property
THPO	Tribal Historic Preservation Officer

This Page Intentionally Left Blank

4.14 TRIBAL RESOURCES

This section describes Tribal Resources and Native American tribes known to have cultural interest in the vicinity of Southern California Edison Company's (SCE) Rush Creek Project (Project). The Federal Energy Regulatory Commission's (FERC) content requirements for this section are specified in Title 18 of the Code of Federal Regulations (CFR) Chapter I § 5.6(d)(3)(xii).

This section identifies Indian tribes that are known to have cultural ties or other tribal interests in the vicinity of the Project, identifies tribal lands in the vicinity of the FERC Project boundary, and identifies tribal cultural or economic interests, including Traditional Cultural Properties (TCP) that may be affected by existing Project operation or maintenance activities.

4.14.1 Information Sources

This section was developed using existing information available in the following primary documents. Additional references are cited in the text, as appropriate. Tribal consultation, archival research, and ethnographic interviews will occur during study plan development and implementation to provide information and ensure tribal interests are identified.

- Native American Heritage Commission (NAHC) Sacred Lands File (SLF) for the Project, received on November 6, 2020 (NAHC 2020a);
- United States Bureau of Indian Affairs (BIA), United States Domestic Sovereign Nations: Land Areas of Federally Recognized Tribes (BIA 2020);
- Management Plan for Historic and Archaeological Resources Associated with the Rush Creek Hydroelectric Project, (FERC Project No. 1389), Mono and Inyo Counties, California (SCE 1990);
- University of California, Berkeley Survey of California and Other Indian Languages, Department of Linguistics (U.C. Berkeley 2019);
- NAHC Digital Atlas (NAHC 2020b);
- Native Land Digital (NLD 2021); and
- Tribes' websites.

4.14.2 Indian Tribes

A "federally recognized tribe" is any tribe, band, nation, or other organized Indian group or community of Indians, including any Alaska Native Village or corporation as defined in or established by the Alaska Native Claims Settlement Act (43 United States Code 1601 *et seq*.), which is recognized as eligible for the special programs and services provided by the United States (2 CFR § 200.54). FERC communicates with recognized and unrecognized tribal groups.

Based on information provided by the NAHC, review of the NAHC Digital Atlas, Native Land Digital, plus a sample of relevant ethnographic and linguistic papers (Golla 2011; Goode 2020; Levy 1978; U.C. Berkeley 2019), and information from SCE's Lee Vining Pre-Application Document (FERC Project No. 1388), the following tribes (in alphabetical order), representatives, and organizations were identified as potentially having an interest in the Project:

- Big Pine Paiute Tribe of the Owens Valley (federally recognized)
- Bishop Paiute Tribe (federally recognized)
- Bridgeport Paiute Indian Colony (federally recognized)
- Mono Lake Indian Community (Mono Lake Kukzadikaa Tribe) (seeking federal recognition)
- North Fork Mono Tribe (seeking federal recognition)
- North Fork Rancheria of Mono Indians (federally recognized)
- Southern Sierra Miwuk Nation (seeking federal recognition)
- Tuolumne Band of Me-Wuk Indians (federally recognized)
- Walker River Reservation (federally recognized)
- Washoe Tribe of Nevada and California (federally recognized)

For ethnographic and archaeological context relating to these tribes, tribal resources, and traditional use, please refer to Section 4.13.2.

These tribal groups have representatives of various bands including, the Me-Wuk, Miwuk[1], Owens Valley Paiute, Northern Paiute, Washo, Western Mono (Nim) and Western Shoshone affiliation and overlapping traditional territories and ranges around the Project (Map 4.14-1). Tribal groups identified are described briefly below, in alphabetical order.

Big Pine Paiute Tribe of the Owens Valley

The federally recognized Big Pine Paiute Tribe, located in Inyo County, California, has actively pursued historic and cultural data about their people and is greatly interested in Paiute heritage and sacred areas in Inyo and Mono counties specifically. The Tribe has a Tribal Historic Preservation Officer (THPO) guided in part by cultural advisors. There are about 600 tribal members, a majority of whom reside on the 279-acre Big Pine Indian

[1] The similarity in English pronunciation of Me-Wuk and Miwuk should not be construed to be a minor spelling variation, as each has linguistic relevance being a separate language. Each stands alone, the former used by the Central Sierra Me-Wuk and the latter used by the Southern Sierra Miwuk.

Reservation. Big Pine tribal members and/or ancestors used the upper regions of the Sierra Nevada near the Project especially for trade, travel, resource gathering, and other traditional activities.

Bishop Paiute Tribe

The federally recognized Bishop Paiute Tribe, is located in Inyo County, California and has also actively pursued historic and cultural data about their people, and is greatly interested in Paiute heritage and sacred areas in Inyo and Mono counties specifically. The Tribe has a THPO with oversight by a Cultural Advisory Committee and the Tribal Council. The Tribe is the fifth largest in California, with about 2,000 tribal members, many of whom reside on the 875-acre Bishop Paiute Indian Reservation (Bishop Paiute Tribe 2021). Bishop tribal members and/or ancestors used upper regions of the Sierra Nevada near the Project especially for trade, travel, resource gathering, and other traditional activities. Several members of Mono Lake Kukzadikaa Tribe are also enrolled with this Tribe.

Bridgeport Paiute Indian Colony

The federally recognized Bridgeport Indian Council, located in Bridgeport, Mono County, California, has actively pursued historic and cultural data about their people. The tribal community consists of Me-Wuk, Mono, Paiute, Shoshone, and Washo descendants (Bridgeport Indian Colony 2012). The Tribe has about 200 tribal members and 80 acres of land (Committee on Natural Resources 2012), but maintains a cultural department to oversee heritage resource matters. Tribal members and/or ancestors used upper regions of the Sierra Nevada especially for trade, travel, resource gathering, and other traditional activities. Several members of Mono Lake Kukzadikaa Tribe are also enrolled with the Bridgeport Paiute Indian Colony.

Mono Lake Indian Community (Mono Lake Kukzadikaa Tribe)

The Mono Lake Indian Community also known as the Mono Lake Kukzadikaa Tribe is at present federally unrecognized, however federal legislation to recognize the Kukzadikaa was introduced to Congress in September 2020. They are located in and around Mono Lake and also share tribal membership affiliation with the Bridgeport Paiute Indian Colony and Bishop Paiute Tribe and have also been long-time affiliated with Yosemite Miwok tribes. They are the closest, geographically located tribal group to the Project, and many tribal members are knowledgeable about the resources and heritage of the Mono Lake and Sierra Nevada region. Under a 501(c)(3) nonprofit organization, they also operate the Mono Lake Kutzadikaa Indian Community Cultural Preservation Association, which assists in cultural overview, and they have been actively working for recognition with the BIA.

North Fork Mono Tribe

The North Fork Mono Tribe is located in the central Sierra Nevada foothills up to the Sierran crest. They are recognized by the state of California and live on several BIA trust allotments. Composed of more than 150 tribal members, the North Fork Mono Tribe has

long been active and has been a strong voice for the advocacy of all tribal cultural resources, including the many plants and materials still gathered and the birds and animals of the area. They have recently mapped the Mono Trail on the western side of the Sierra to connect with various passes, such as Mono, Parker, and Tioga, and the eastern Sierra portion of the Mono Trail near the Project.

North Fork Rancheria of Mono Indians

The North Fork Rancheria of Mono Indians is a federally recognized Indian tribe listed in the Federal Register as the Northfork Rancheria of Mono Indians of California. This large tribe is located in the small community of North Fork, in rural Madera County west of the Project. North Fork people speak a version of Northern Paiute, and have deep ancestral and genealogical ties to Mono Lake and areas south. They conduct an annual Mono Nation walk which crosses the Sierra either east to west or west to east, south of the Project in alternating years.

Southern Sierra Miwuk Nation

The Southern Sierra Miwuk Nation is the group most commonly affiliated with the eastern portion of Yosemite National Park and Mariposa County, northwest of the Project. Members of the group have Mono Lake Paiute and Miwuk heritage and are knowledgeable about the resources and geography north of the Project. A trans-Sierran walk, assembled both by Miwuk and Paiute, occurs near Mono Lake from the Farrington Ranch, crossing Mono Pass into Dana Meadows north of the Project, and down through the Yosemite high country near the Tioga Road to Tenaya Lake in Tuolumne County. The direction of the hike changes from year-to-year.

Tuolumne Band of Me-Wuk Indians

The Tuolumne Band of Me-Wuk Indians, located in Tuolumne, California, is a federally recognized tribe with ancestral territory that extends into much of northern Yosemite and the Tioga Pass region north of the Project. Although they do not have a THPO, they have a strong and active heritage resource program. Tribal members have ancestors affiliated with Bridgeport and Mono Lake, as well as all three Sierran Miwok language groups.

Walker River Reservation

The federally recognized Walker River Paiute Tribe (also known as Agai-Dicutta “Trout Eaters”) is located in Nevada on the Walker River Reservation created in 1874. The reservation has more than 1,200 people residing on their land base of nearly 325,000 acres. Tribal members and/or ancestors used upper regions of the Sierra Nevada especially for trade, travel, resource gathering, and other traditional activities (Walker River Paiute Tribe 2021). They have strong genealogical and historical ties to the Mono Lake Kukzadikaa Tribe.

Washoe Tribe of Nevada and California

The federally recognized Washoe[2] Tribe of Nevada and California has deep heritage into the Mono County region, although the majority of their land base and tribal members reside in Nevada. The Tribe has a THPO who works with a cultural advisory committee composed mainly of Washo-speaking elders. They have several distinct colonies; and members of the Woodfords Colony in Markleeville, Alpine County, have the greatest affiliation with lands north of the Project. These people, the Southern Washo, are known as the Hungalelti (Davis-King 2007).

4.14.3 Tribal Lands

Tribal lands are defined as all lands within the boundaries of an Indian reservation and all dependent Indian communities (36 CFR Part 800.16[x]) and any lands held in trust for any tribe by the BIA. Based on review of BIA data sources, there are no tribal lands located within or adjacent to the FERC Project boundary (BIA 2020).

4.14.4 Tribal Resources and Interests

As detailed in Section 4.13, Cultural Resources, the majority of the areas located within the FERC Project boundary were surveyed for cultural resources between 1985 and 1989 as part of the previous relicensing effort (SCE 1990). Additionally, several studies since relicensing have documented cultural resources in the FERC Project boundary. The results of these efforts are summarized in Section 4.13.3. No field investigation of tribal groups or interests has occurred in the vicinity of the Project, and the earlier relicensing ethnographic overview was largely an archival review with no ethnographic interviews or field studies.

4.14.5 Traditional Cultural Properties

A TCP is a resource that is eligible for inclusion in the National Register of Historic Places (NRHP) based on its associations with the cultural practices, traditions, beliefs, lifeways, arts, crafts, or social institutions of a living community. TCPs are rooted in a traditional community's history and are important in maintaining the continuing cultural identity of that community. A TCP must have integrity and meet at least one of the four NRHP eligibility criteria (36 CFR 63) to be considered a historic property (defined as a resource listed in or determined eligible for the NRHP). While the FERC Project boundary was surveyed for archaeological resources as part of these earlier studies, no TCPs, Traditional Cultural Landscapes, or other resources of tribal interest were identified within or in the immediate vicinity of the FERC Project boundary. SCE is not aware of any tribal practices or traditions that would be affected by operation and maintenance of the Project, or of any agreements between the Indian tribes and other entities that are relevant to the Project. An NAHC SLF conducted for the FERC Project boundary and a 1-mile buffer did not identify any Sacred Lands (NAHC 2020a). To date, no TCPs have been identified, but

[2] While the formal name of the Tribe includes the word "Washoe" due to federal government wording, the people prefer the term "Washo" when not referring to the tribal name.

the potential for these will be investigated more fully during future studies conducted in support the current relicensing effort.

4.14.6 References

BIA (U.S. Bureau of Indian Affairs), Pacific Region. 2020. United States Domestic Sovereign Nations: Land Areas of Federally Recognized Tribes. Accessed: November 6, 2020. Available at: https://biamaps.doi.gov/indianlands/#.

Bishop Paiute Tribe. 2021. About the Bishop Paiute Tribe. Accessed: April 16, 2021. Available at: http://www.bishoppaiutetribe.com/about-us.html.

Bridgeport Indian Colony. 2012. Home Page: Brief history & Mission Statement. Accessed: April 16, 2021. Available at: http://www.bridgeportindiancolony.com/.

Committee on Natural Resources. 2012. Bridgeport Indian Colony Land Trust, Health, and Economic Development Act of 2012. H. Rept. 112-611. 12th Congress (2011-2012).

Davis-King, Shelly. 2007. The Land Where the Unabiya Hungalelti, Me-Wu, and Tövusidökadö Pozidadikadi Meet: Native American Background Research for the United States Marine Corps Mountain Warfare Training Center Mono County, California. Draft report submitted to United States Marine Corps Base Camp Pendleton, Camp Pendleton, California.

Golla, Victor. 2011. California Indian languages. Berkeley, California: University of California Press.

Goode, R.W. 2020. The North Fork Mono Trail, Nium Trail Network. Original Segment Published in Water Stores I, Tribal Water Summit 2009. Updated 2020.

Levy, R. 1978. Eastern Miwok. In California. Robert F. Heizer (editor). 398-413 pp. Handbook of North American Indians Vol. 8, William G. Sturtevant (editor). Washington, D.C.: Smithsonian Institution.

NAHC (Native American Heritage Commission). 2020a. Response to SLF Request, Rush Creek Hydroelectric Project, Mono County, California. November 2020.

———. Digital Atlas. 2020b. Available at: https://www.arcgis.com/apps/View/index.html?appid=03512d83d12b4c3389281e3a0c25a78f&extent=-130.0858,31.7873,-109.6622,42.6447.

NLD (Native Land Digital). 2021. Available at: https://native-land.ca/.

SCE (Southern California Edison Company). 1990. Management Plan for Historic and Archaeological Resources Associated with the Rush Creek Hydroelectric Project, (FERC Project No. 1389), Mono and Inyo Counties, California. April 1990.

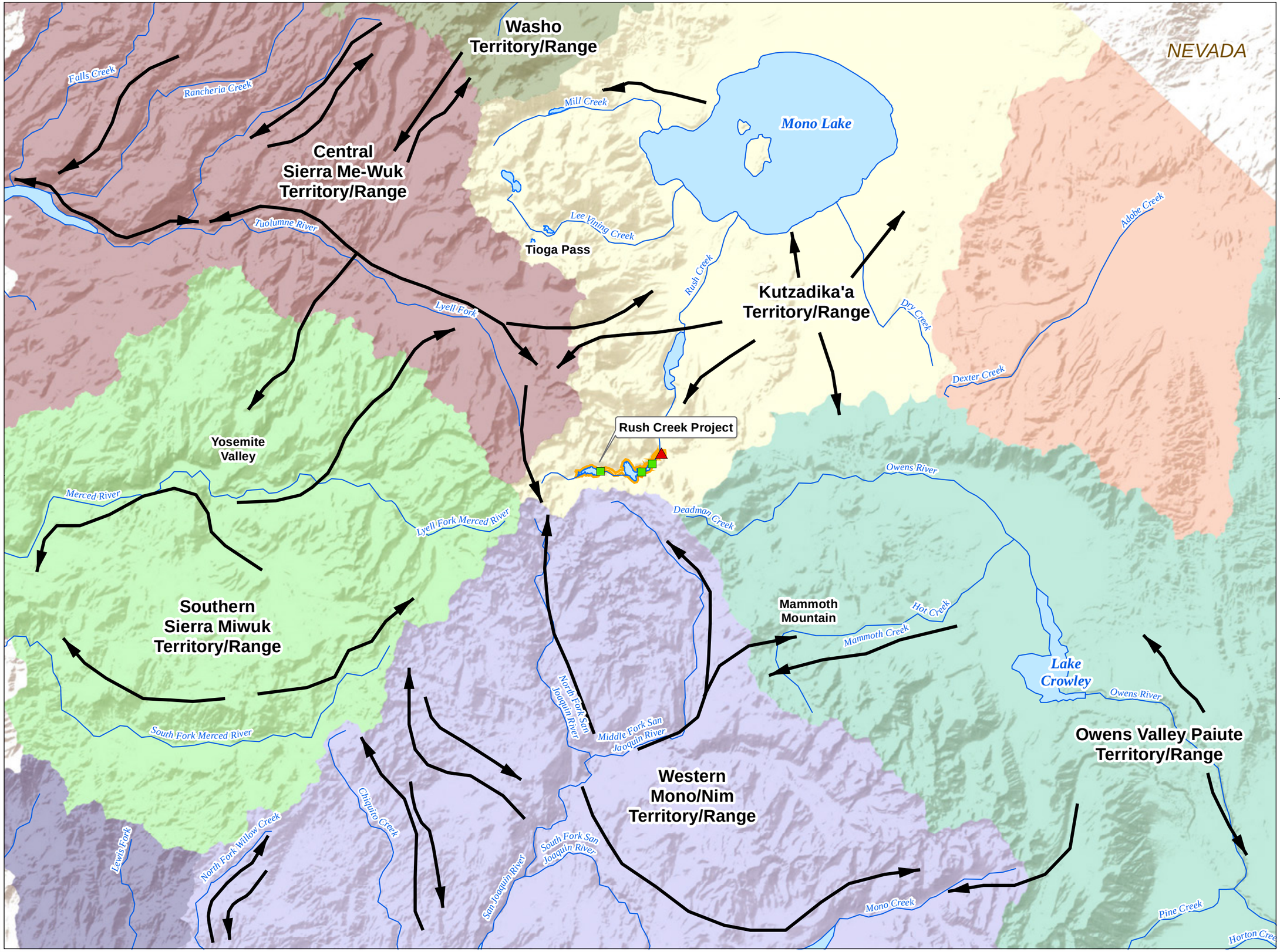
U.C. Berkeley (University of California, Berkeley). 2019. Survey of California and Other Indian Languages, Department of Linguistics, Berkeley, California.

Walker River Paiute Tribe. 2021. The Walker River Paiute Tribe. Homepage. Accessed: April 16, 2021. Available at: https://www.wrpt.org/agai-dicutta-numu/.

This Page Intentionally Left Blank

MAPS

This Page Intentionally Left Blank



SCE Facilities

- Dam
- Powerhouse
- FERC Boundary

Other Features

- Highway
- River/Stream
- Lake

Watershed Boundaries

- Adobe
- Ahwahnee
- East Walker River
- Merced River
- Mono
- Owens
- San Joaquin River
- Tuolumne River

Tribal Territory/Range

- Approximate Movement Between Groups

SOUTHERN CALIFORNIA EDISON®
An EDISON INTERNATIONAL® Company

Rush Creek Project (FERC 1389)

Map 4.14-1

Regional Watersheds and Tribal Territory/Range

0 2.5 5 Miles

Projection: UTM Zone 11
Datum: NAD 83

Date: 5/18/2021

C:\GIS\Cardno\30735240_SCE_EasternHydro\map\Rush Creek\Cultural Maps\SCE_RUSH_CREEK_Wshed_TribalTerritories_17i11i_01.mxd

This Page Intentionally Left Blank

TABLE OF CONTENTS

LIST OF TABLES

LIST OF ACRONYMS

ACS	American Community Survey
ALMIS	America's Labor Market Information System
BEA	United States Bureau of Economic Analysis
CDP	Census Designated Place
County	Mono County
DOF	Department of Finance
EDD	Economic Development Department
FERC	Federal Energy Regulatory Commission
Forest Service	United States Forest Service
Project	Rush Creek Project
SCE	Southern California Edison Company
USCB	United States Census Bureau

This Page Intentionally Left Blank

4.15 SOCIOECONOMICS

This section provides a general description of the socioeconomic conditions in the vicinity of Southern California Edison Company's (SCE) Rush Creek Project (Project). The Federal Energy Regulatory Commission's (FERC) content requirements for this section are specified in Title 18 of the Code of Federal Regulations Chapter I § 5.6(d)(3)(xi). The following sections summarize socioeconomic conditions, including general land use patterns, population patterns, and sources of employment in the vicinity of the Project. Refer to Section 4.10, Land Use for more information regarding the land use in the Project vicinity.

4.15.1 Information Sources

This section was developed using existing information available in the following primary sources. Additional references are cited in the text, as appropriate.

- California Department of Finance (DOF) reports on population projections (DOF 2021a, 2021b);
- California Employment Development Department (EDD) reports on Labor Force and Unemployment Rate (EDD 2019);
- Mono County General Plan (Mono County 2015);
- Mono County Housing Element (Mono County 2019a);
- United States Census Bureau (USCB) data on population and housing (USCB 2010, 2019); and
- United States Bureau of Economic Analysis (BEA) data on personal income and industry earnings (BEA 2019).

4.15.2 General Land Use Patterns

The Project is located on Rush Creek on the eastern slope of the Sierra Nevada in Mono County, California (Map 2-1). The Project is situated approximately 4 miles southwest of the unincorporated community of June Lake and approximately 14 miles upstream from Mono Lake.

Mono County (county) is a rural county bounded to the west by the crest of the Sierra Nevada and to the east by the California/Nevada border. The county is a long, narrow strip of land covering 3,028 square miles and measuring 108 miles at its greatest length and 38 miles in average width. Approximately 94% of the county is on public land administered by either the United States Forest Service (Forest Service), the United States Bureau of Land Management, the State of California, or the Los Angeles Department of Water and Power (Mono County 2021a). Much of Mono County remains open space.

The area around the Rush Creek Powerhouse is located on SCE-owned lands. However, the majority of the Project facilities occupy federal lands within the Inyo National Forest which is under the jurisdiction of the Forest Service. Land use within the FERC Project boundary includes hydropower generation and dispersed recreation.

Land located adjacent to the FERC Project boundary consists of private land managed by Mono County and public land managed by the Forest Service. Land use adjacent to the FERC Project boundary includes resource management and natural habitat protection. June Lake, the community nearest to the Project, has land uses of residential, commercial, and commercial lodging (Mono County 2021b).

Development in unincorporated areas of Mono County is primarily residential with limited small-scale commercial uses serving local and tourist/recreational needs. Land use and development patterns in the unincorporated areas of the county are not anticipated to change due to the small scale of communities in Mono County and the lack of employment opportunities. In addition, large new development outside the existing communities is limited by environmental constraints, protected agricultural lands, lack of large privately-owned parcels), and the high cost of providing infrastructure and services in isolated areas (Mono County 2019b).

4.15.3 Population Characteristics

The most recent complete census data is from 2010 and provides information for communities in Mono County. A Census Designated Place (CDP) is a concentration of population identified by the Census Bureau for statistical purposes. Ninety percent of the population in the unincorporated county lives within one of the 15 CDPs identified in Mono County. The unincorporated community of June Lake is the nearest CDP to the Project. The town of Mammoth Lakes is the only incorporated community within the county.

The Mono County population as of the 2010 census totaled 14,202 residents, a majority of which (58%, or 8,234) resided in the town of Mammoth Lakes. The unincorporated communities with the highest 2010 population included Crowley Lake (875 residents), Walker (721 residents), Chalfant (651 residents), June Lake (629 residents), and Bridgeport (575 residents). The communities with the lowest population included McGee Creek (41 residents), Topaz (50 residents), and Aspen Springs (65 residents) (USCB 2010). Table 4.15-1 provides a summary of population within Mono County.

In 2010, the unincorporated county had a median age of 45.0 years, which was substantially higher than the town of Mammoth Lakes median of 32.6 years. The unincorporated communities with the highest 2010 median age included McGee Creek (54.8 years), Swall Meadows (53.8 years), Paradise (52.9 years), and Walker (51.1 years). The communities with the lowest median age included Coleville (25.7 years), Lee Vining (30.4 years), and Mono City (41.0 years) (USCB 2010). Table 4.15-1 provides a summary of median age within Mono County.

To illustrate trends in population, Table 4.15-2 lists population for 2010 through 2060 as reported in the 2010 census and in population projections developed by the California

DOF. Population growth in the unincorporated areas of Mono County was rapid from 1980 until 2000, when it slowed considerably. Population projections by the DOF indicate a declining population countywide through 2060. While DOF does not speculate on the reason for this decline, it could be a result of an aging population, limited industry, and lack of employment opportunities.

The countywide population in 2010 was largely white (68.2%). The majority of the remaining county population (26.5%) identified themselves as Hispanic or Latino (USCB 2010) (Table 4.15-3). The California Department of Finance projects that the Hispanic population in the county will rise over the next forty years, to 30.2% of the total county population in 2030 and 36.6% of the total in 2060 (DOF 2021a) (Table 4.15-4).

The unincorporated community of June Lake, the closest community to the Project, had a total population of 629 residents in 2010, which makes up 4.4% of the countywide population. Of those residents, 75.7% were white and 21.8% Hispanic. The median age in the community in 2010 was 41.7 years (USCB 2010).

4.15.4 Household / Family Distribution and Income

The 2010 census reported the total number of households in the county to be 5,768 (Mammoth Lakes with 3,229 and the unincorporated area of the county with 2,539). Countywide the average household size decreased from 2.51 in 1990 to 2.42 in 2010. Coleville had the highest average household size, with 2.89 persons per household. The lowest average household sizes were reported in McGee Creek and Paradise with 1.95 and 2.07 persons per household, respectively (USCB 2010) (Table 4.15-5).

The overall number of renters in the unincorporated county decreased from 40% of all occupied units in 1990 to 32% in 2010. Vacancy rates continue to increase as more units are used for second homes and short-term rental units. The overall vacancy rate in the unincorporated county increased from 34.4% in 2010 to 48.2% in 2016. Mono County has taken an active approach to slowing down the rate of increase by adopting strict short-term regulations in 2018 (Mono County 2019a).

June Lake's housing landscape provides a great deal of variety as it contains a mix of multi-family and single-family homes dispersed throughout the unincorporated community. A defining characteristic of housing in June Lake is the low percentage of permanently occupied units. Nearly three out of four units are not permanently occupied, typically being used as second homes or short-term rentals. Similar to the county, the community of June Lake has developed stringent, neighborhood-specific short-term rental policies, which may help increase the number of long-term housing opportunities (Mono County 2019a).

The countywide household median income was $61,868 in 2010, which increased from $45,325 in 2000. However, the median household income varies significantly throughout the county, as the communities near the town of Mammoth Lakes generally have higher overall income levels. The unincorporated community of Sunny Slopes has the highest median income of $133,287 while the unincorporated community of Benton has the

lowest median income at $33,048. The unincorporated community of June Lake has a median income of $50,329 (USCB 2010).

Estimates from the American Community Survey (ACS) identify the median household income for Mono County in 2019 dollars to be $62,260. ACS also estimates that 13.4% of all people in the county have an income in the past 12 months that is below the poverty level (USCB 2019).

4.15.5 Employment

Data from the EDD for the Eastern Sierra-Mother Lode Region indicate that Mono County's overall employment is dominated by the following sectors: leisure and hospitality; government; trade, transportation, and utilities; and educational services, health care, and social assistance. Industry projections estimate the job growth in the area between 2018 and 2028 will continue to be strongest in these areas (EDD 2018; BEA 2019).

The scenic and recreational attributes of the public land in Mono County help support tourism and recreation as the major industry in the county. Notwithstanding the negative economic impacts caused by public health measures associated with the COVID-19 related pandemic, approximately 38.5% of all employment is directly associated with this industry. Typically, more than 1.5 million visitors stay in Mono County on average for three days, generating $369.6 million for the local economy and $16 million in local taxes (Mono County 2021a).

Major employment centers are located in Mammoth Lakes, June Lake, and Bridgeport. The list of major employers within Mono County as of 2020 are found in Table 4.15-6. The major employers located within the unincorporated community of June Lake include the Double Eagle Resort and the June Mountain Ski Area (ALMIS 2021).

4.15.6 References

ALMIS (American Labor Market Information System). 2021. Employer Database, 1st edition. Available at: https://www.labormarketinfo.edd.ca.gov/majorer/countymajorer.asp?CountyCode=000051.

BEA (United States Bureau of Economic Analysis). 2019. CAINC5N Personal Income by Major Component and Earnings by NAICS Industry. Mono County. Available at: https://apps.bea.gov/iTable/iTable.cfm?reqid=70&step=1&isuri=1.

DOF (California Department of Finance). 2021a. Demographic Research Unit. Report P-2D: Population Projections by Total Hispanic and Non-Hispanic Race, California Counties, 2010-2060 (Baseline 2019 Population Projections; Vintage 2020 Release). Sacramento: California. March 2021.

———. 2021b. Demographic Research Unit. Report P-2A: Total Population Projections, California Counties, 2010-2060 (Baseline 2019 Population Projections; Vintage 2020 Release). Sacramento: California. March 2021.

EDD (State of California, Employment Development Department). 2018. Eastern Sierra-Mother Lode Region (Alpine, Amador, Calaveras, Inyo, Mariposa, Mono, and Tuolumne Counties), 2018-2028 Industry Sector Employment Projections. Available at: www.labormarketinfo.edd.ca.gov/data/employment-projections.html.

———. 2019. Labor Force and Unemployment Rate for Mono County. Available at: https://www.labormarketinfo.edd.ca.gov/geography/mono-county.html.

Mono County. 2015. General Plan Update and Regional Transportation Plan. Mono County Community Development Department. Available at: https://monocounty.ca.gov/sites/default/files/fileattachments/planning_division/page/8022/2_draft_eir_with_appendices_7.31.15.pdf.

———. 2019a. Mono County Housing Element. 6th Cycle Update, Mono County Community Development Department. Available at: https://monocounty.ca.gov/sites/default/files/fileattachments/planning_division/page/9617/2019-2027_housing_element_final.pdf.

———. 2019b. Mono County Regional Transportation Plan. Amended December 9, 2019.

———. 2021a. Department of Finance, Auditor Controller. Comprehensive Annual Financial Report of the County of Mono for the Fiscal Year ended June 30, 2020. April.

———. 2021b. Mono County Parcel Land Use Designation Application. Available at: https://gis.mono.ca.gov/apps/pv/.

USCB (United States Census Bureau). 2010. 2010 Census. U.S. Census Bureau 2010. Available at: www.census.gov.

———. 2019. American Community Survey, 5-Year Data Profiles (2015-2019) for Mono County. Available at: https://www.census.gov/acs/www/data/data-tables-and-tools/data-profiles/.

This Page Intentionally Left Blank

TABLES

This Page Intentionally Left Blank

Table 4.15-1. Mono County Total Population and Median Age (2010)

	Total Population (2010)	Median Age (years)
Countywide	14,202	37.2
Mammoth Lakes	8,234	32.6
Unincorporated County	5,968	45.0
County Inside CDPs	5,331	–
County Outside CDPs	637	–
Mono County CDPs Detail		
Aspen Springs	65	47.8
Benton	280	48.8
Bridgeport	575	45.5
Chalfant	651	47.1
Coleville	495	25.7
Crowley Lake	875	45.1
June Lake	629	41.7
Lee Vining	222	30.4
McGee Creek	41	54.8
Mono City	172	41
Paradise	153	52.9
Sunny Slopes	182	47.2
Swall Meadows	220	53.8
Topaz	50	45.7
Walker	721	51.1

Source: USCB 2010

Table 4.15-2. Estimated and Projected Population for Mono County

Year	Population
2010*	14,202
2020	13,447
2030	14,118
2040	14,009
2050	13,367
2060	12,422

Source: USCB 2010, DOF 2021b

Table 4.15-3. Mono County Total Population by Race (2010)

	Total Population							
	White	**Hispanic**	**American Indian**	**Asian**	**Black**	**Pacific Islander**	**Other**	**2 or More Races**
Countywide	9,687	3,762	239	191	42	11	33	237
Mammoth Lakes	5,143	2,772	32	128	29	5	13	112
Unincorporated County	4,544	990	207	63	13	6	20	125
County Inside CDPs	4,055	881	192	53	11	5	20	114
County Outside CDPs	489	109	15	10	2	1	0	11
Mono County CDPs Detail								
Aspen Springs	61	1	0	2	0	0	0	1
Benton	188	38	49	1	0	0	0	4
Bridgeport	370	148	40	1	1	0	1	14
Chalfant	552	67	8	5	0	0	3	16
Coleville	347	110	10	8	4	0	2	14
Crowley Lake	706	128	5	11	3	0	5	17
June Lake	476	137	6	2	0	0	0	8
Lee Vining	107	96	17	0	0	0	2	0
McGee Creek	39	2	0	0	0	0	0	0
Mono City	128	37	1	2	0	0	0	4
Paradise	121	14	1	6	0	0	5	6
Sunny Slopes	158	3	2	7	0	4	0	8
Swall Meadows	196	6	2	5	0	0	2	9
Topaz	25	24	1	0	0	0	0	0
Walker	581	70	50	3	3	1	0	13

Source: USCB 2010

Table 4.15-4. Mono County Projected Population by Race/Ethnicity

Race/Ethnicity	2021	2030	2040	2050	2060
White	9,108	9,097	8,636	7,872	7,078
Black	39	35	42	38	58
American Indian or Alaska Native	206	221	251	228	184
Asian	214	196	194	194	179
Native Hawaiian or Pacific Islander	11	10	14	11	7
Multi-racial	254	297	312	343	371
Hispanic (any race)	4,006	4,262	4,560	4,681	4,545
Total Projected Population	**13,838**	**14,118**	**14,009**	**13,367**	**12,422**
Percent of Total Population	**28.9**	**30.2**	**32.6**	**35.0**	**36.6**

Source: DOF 2021b

Table 4.15-5. Household Characteristics (2010)

	Average Household Size	Average Family Size	Total Households
Countywide	2.42	2.98	5,768
Mammoth Lakes	2.5	3.14	3,229
Unincorporated County (Total)	2.38	3.04	2,539
Mono County CDPs Detail			
Aspen Springs	2.6	2.73	25
Benton	2.3	2.81	122
Bridgeport	2.18	2.83	257
Chalfant	2.47	2.87	264
Coleville	2.89	3.23	171
Crowley Lake	2.37	2.88	367
June Lake	2.16	2.77	290
Lee Vining	2.51	3.25	85
McGee Creek	1.95	2.5	21
Mono City	2.73	2.94	63
Paradise	2.07	2.47	74
Sunny Slopes	2.14	2.82	85
Swall Meadows	2.24	2.6	98
Topaz	2.38	3.08	21
Walker	2.15	2.61	335

Source: USCB 2010

Table 4.15-6. Major Employers in Mono County

Employer Name	Location	Industry	Employer Size Class
Annett's Mono Village	Bridgeport	Resorts	20-49
Coleville High School	Coleville	Schools	50-99
Double Eagle Resort	June Lake	Resorts	50-99
June Mountain Ski Area	June Lake	Skiing Centers & Resorts	100-249
Juniper Springs Resort	Mammoth Lakes	Resorts	100-249
Mammoth Elementary School	Mammoth Lakes	Schools	50-99
Mammoth Mountain Inn	Mammoth Lakes	Resorts	50-99
Mammoth Ranger District Ctr.	Mammoth Lakes	Government Offices – US	50-99
Mammoth Reservations Inc.	Mammoth Lakes	Vacation Rentals	50-99
Mammoth Resorts	Mammoth Lakes	Resorts	1,000-4,999
Mammoth Unified School District	Mammoth Lakes	School Districts	250-499
Mammoth Pacific LP	Mammoth Lakes	Geothermal Exploration	20-49
Mono County Office – Emergency	Bridgeport	Government Offices – County	50-99
Mono County Public Works Dept.	Bridgeport	Utility Contractors	100-249
Morrison's	Mammoth Lakes	Restaurants	20-49
Restaurant at Convict Lake	Crowley Lake	Restaurants	20-49
Robert's Mexican Café	Mammoth Lakes	Restaurants	20-49
Sheriff Office – Finance	Bridgeport	Sheriff	50-99
Sierra Nevada Lodge	Mammoth Lakes	Swimming Pools-Public	50-99
Sierra Star Golf Course	Mammoth Lakes	Golf Courses	20-49
Tamarack Lodge & Resort	Mammoth Lakes	Resorts	50-99
Toomey's Catering & Carry-Out	Mammoth Lakes	Restaurants	20-49
Village Lodge Mammoth	Mammoth Lakes	Resorts	100-249
Vons	Mammoth Lakes	Grocers – Retail	100-249
Westin Monache Resort Mammoth	Mammoth Lakes	Hotels & Motels	100-249

Source: ALMIS 2021