# SOUTHERN CALIFORNIA EDISON

## Rush Creek Hydroelectric Project
## (FERC Project No. 1389)

## DRAFT LICENSE APPLICATION

## VOLUME III (PART 1 OF 3): EXHIBIT E
## ENVIRONMENTAL EXHIBIT

SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead℠

August 2024

# SOUTHERN CALIFORNIA EDISON

# Rush Creek Hydroelectric Project
# FERC Project No. 1389

## Draft License Application

## Volume III (Part 1 of 3): Exhibit E
## Environmental Exhibit

Southern California Edison
2244 Walnut Grove Avenue
Rosemead, CA 91770

August 2024

***Support from:***

Stantec

# LIST OF EXHIBITS

Exhibit E Environmental Exhibit

## TABLE OF CONTENTS

Page

1.0 Introduction ........................................ 1-1
  1.1 References ........................................ 1-1

## LIST OF ACRONYMS

| | |
|---|---|
| CFR | Code of Federal Regulations |
| Exhibit E | Exhibit E – Environmental Exhibit |
| FERC | Federal Energy Regulatory Commission |
| Project | Rush Creek Project |

# 1.0 INTRODUCTION

This Exhibit E – Environmental Exhibit (Exhibit E) is being filed with the Federal Energy Regulatory Commission (FERC) by Southern California Edison Company as part of the Application for New License for the Rush Creek Project (Project) (FERC Project No. 1389).

As specified in Title 18 of the Code of Federal Regulations (CFR) § 5.18(b), this Exhibit E addresses the resources listed in the Pre-Application Document provided for in 18 CFR § 5.6; follows FERC's guidelines in "Preparing Environmental Documents: Guidelines for Applicants, Contractors, and Staff" (FERC 2008); and meets the format and content requirements specified by FERC.

This Exhibit E provides the necessary technical information and analyses to identify and evaluate potential impacts of continued operation and maintenance of the Project and disposition of select Project facilities under the Proposed Action compared to the No-Action Alternative. In addition, the Exhibit E specifies new measures under the Proposed Action to protect and enhance environmental and cultural resources. The Proposed Action in this Exhibit E considers input from state and federal resource agencies, Native American Tribes, non-governmental organizations, and members of the public (collectively referred to as stakeholders) acquired during consultation activities completed for the relicensing of the Project.

## 1.1 REFERENCES

FERC (Federal Energy Regulatory Commission). 2008. Preparing Environmental Documents: Guidelines for Applicants, Contractors, and Staff. Office of Energy Projects Division of Hydropower Licensing. September.

## TABLE OF CONTENTS

Page

2.0 Application ........ 2-1
2.1 Project Location ........ 2-1
2.2 Overview of Existing Project ........ 2-1
2.3 Overview of Proposed Action ........ 2-2

## LIST OF MAPS

Map 2-1. Project Facilities and Land Jurisdictions ........ 2-4

## LIST OF ACRONYMS

| | |
|---|---|
| FERC | Federal Energy Regulatory Commission |
| License Application | Application for New License for Major Project – Existing Dam |
| Project | Rush Creek Project |
| SCE | Southern California Edison Company |

# 2.0 APPLICATION

Southern California Edison Company (SCE) is applying to the Federal Energy Regulatory Commission (FERC) for a new license for the existing Rush Creek Project (Project). This draft Application for New License for Major Project – Existing Dam (License Application) was filed on or about September 3, 2024, pursuant to FERC regulations at Title 18 of the Code of Federal Regulations § 5.16 and § 5.18.

The Project is designated as FERC Project No. 1389, pursuant to the license issued on February 4, 1997, but effective February 1, 1997, for a period of 30 years, expiring on January 31, 2027. Through submittal of this License Application, SCE is requesting renewal of its license to continue operation and maintenance of a modified project with a license term of 50 years. The new license term is based on the substantial costs associated with relicensing the Project; capital investments for Project modifications; and ongoing resource agency consultation to ensure continued resource protection over the term of the new license.

## 2.1 PROJECT LOCATION

The Project is located on Rush Creek on the eastern slope of the Sierra Nevada in Mono County, California. The Project is 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, most of the Project facilities occupy federal lands within the Inyo National Forest, which is under the jurisdiction of the United States Forest Service. Portions of the Project are also located on land within the Ansel Adams Wilderness Area and a 135-foot-long section of a Project distribution line (aerial cable) crosses the Owens River Headwaters Wilderness Area.[1] Under the existing Project license, the total acreage of federal lands used by the Project is 688 acres. Map 2-1 depicts the location of Project facilities and land jurisdiction in the vicinity of the Project.

## 2.2 OVERVIEW OF EXISTING PROJECT

The Project includes three dams and associated reservoirs – Rush Meadows Dam (Waugh Lake), Gem Dam (Gem Lake), and Agnew Dam (Agnew Lake); a water conveyance system; the Rush Creek Powerhouse; and ancillary facilities. Rush Meadows Dam was completed in 1918, and subsequently raised in 1924 and 1925. Original construction of Gem Dam was completed between 1915 and 1917, and an additional gravity section was added in 1924. Construction of Agnew Dam was completed between 1915 and 1917.

The Rush Creek Project Powerhouse has an installed generating capacity of 13.01 megawatts[2] and over the current license period (1997–2023), the average annual energy production of the Project was 39,374-megawatt hours. The three Project reservoirs

[1] No poles or towers are located within the Owens River Headwaters Wilderness Area.
[2] The Federal Energy Regulatory Commission authorized capacity is 11.85 megawatts.

historically provided storage for lake recreation during the summer and allowed for electricity generation at the Rush Creek Powerhouse. Water exiting the powerhouse enters a short tailrace and is returned to Rush Creek upstream of Silver Lake.

Due to the Silver Lake Fault being identified as a potential safety concern in 2007, SCE conducted fault studies, structural testing, and engineering analyses of Agnew, Gem, and Rush Meadows dams. As a result of the analyses and subsequent consultation with FERC's Division of Dam Safety and Inspections and the California Department of Water Resources' Division of Safety of Dams, SCE requested and obtained approval to implement storage restrictions at the three reservoirs to address the safety concerns beginning in 2012 and implemented structural modifications at Agnew and Rush Meadows dams in 2017 and 2018, respectively, and Gem Dam in 2020 and 2021.

Refer to Section 4, No-Action Alternative for additional details on the existing Project location, facilities, operation, and maintenance activities, and Section 4.1.2.1 for additional information regarding the seismic restrictions and structural modifications.

## 2.3 OVERVIEW OF PROPOSED ACTION

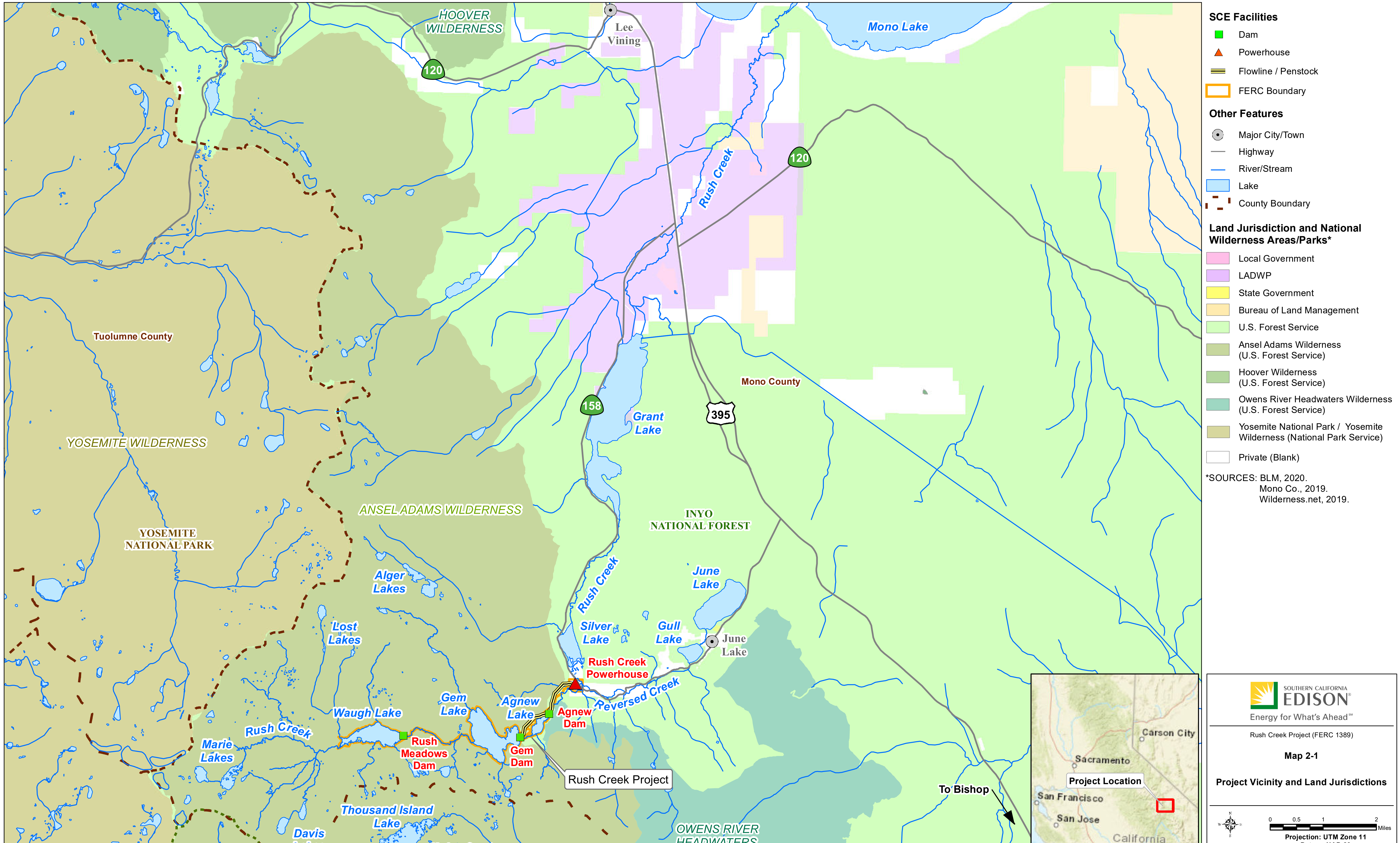
SCE's Proposed Action includes the following Project modifications:

- Partial removal of Agnew and Rush Meadows dams; and
- Retrofitting Gem Dam to facilitate continued operation of the Project for power generation.

Under the Proposed Action, hydroelectric operations at Rush Meadows and Agnew dams would be discontinued and these facilities would be removed from the FERC license once all license conditions and regulatory requirements of FERC and other resource agencies are met. Gem Dam would be retrofitted to facilitate compliance with seismic restrictions under a probable maximum flood event with a new spillway and reduced dam height. Under the Proposed Action, hydroelectric operations at Gem Dam and Rush Creek Powerhouse would continue under FERC jurisdiction consistent with conditions identified in a new FERC license. No new generation capacity is proposed to be added to the Project.

Refer to Section 5, Proposed Action for additional details on modifications included under the Proposed Action.

# MAPS






C:\GIS\237800343\map\Rush Creek\SCE_RUSH_CREEK_Juris_Vicinity_17i11i_01.mxd

## TABLE OF CONTENTS

Page

3.0 Purpose of Action and Need for Power........................................................3-1
3.1 Purpose of Action........................................................................3-1
3.2 Need for Power ..........................................................................3-1
3.2.1 Power Demand......................................................................3-2
3.2.2 California Legislation ...........................................................3-3
3.3 References....................................................................................3-4

## LIST OF ACRONYMS

| | |
|---|---|
| Exhibit E | Exhibit E – Environmental Exhibit |
| FERC | Federal Energy Regulatory Commission |
| FPA | Federal Power Act |
| GHG | greenhouse gas |
| ISO | Independent System Operator |
| NERC | North American Electric Reliability Corporation |
| Project | Rush Creek Project |
| RPS | Renewable Portfolio Standard |
| SB | Senate Bill |
| SCE | Southern California Edison Company |
| WECC | Western Electricity Coordinating Council |
| WY | water year |

# 3.0 PURPOSE OF ACTION AND NEED FOR POWER

## 3.1 PURPOSE OF ACTION

The federal action to be considered by the Federal Energy Regulatory Commission (FERC) is the issuance of a new license to Southern California Edison Company (SCE), under the Federal Power Act (FPA), for continued operation and maintenance of the Rush Creek Project (Project) and disposition of select Project facilities.

In deciding whether to issue a new license, FERC must determine that the Project would be best adapted to a comprehensive plan for improving or developing the waterway. In addition to the power and developmental purposes for which licenses are issued (e.g., flood control, irrigation, and water supply), FERC must give equal consideration to the purposes of energy conservation; the protection, mitigation of damage to, and enhancement of fish and wildlife (including related spawning grounds and habitat); protection of recreational opportunities; and preservation of other aspects of environmental quality.

This Exhibit E – Environmental Exhibit (Exhibit E) provides the information necessary for FERC to develop new license conditions for the Project. The Exhibit E presents a description and analysis of the environmental and economic effects of the Proposed Action and No-Action Alternative. Several other alternatives were considered in Exhibit E, but eliminated from detailed analysis because they are not considered reasonable, including Federal government takeover; issuance of a non-power license; and project decommissioning (see Section 6, Other Alternatives).

## 3.2 NEED FOR POWER

SCE is a publicly regulated utility that supplies electricity to approximately 15 million people in a 50,000 square mile service area covering portions of coastal, central, and southern California. SCE serves all customers through a diverse transmission system and has a generation mix based on several different resources, such as renewables (e.g., solar, wind, geothermal), natural gas, nuclear, and hydroelectric. SCE also purchases power from other utilities or non-utility power producers.

Hydroelectric power from the Project is produced at the Rush Creek Powerhouse, which has a total installed capacity of 13.01 megawatts. Project operations are described for two periods: (1) Historical Operations (water years [WY] 1990–2011), prior to implementation of reservoir elevation restrictions; and (2) Current Operations (WY 2012–2023), post-implementation of the reservoir elevation restrictions. Under Historical Operations (WY 1990–2011), average annual energy production was 46,181 megawatt hours. Under Current Operations (WY 2012–2023), average annual energy production was 33,022 megawatt hours.

The Rush Creek Powerhouse is used to respond to California Public Utility Commission and California Independent System Operator (ISO) demands for power. Demands can be market driven (i.e., energy needs and renewable load), or used to stabilize the grid. When the source transmission line is de-energized (115-kilovolt Casa Diablo line), the Rush

Creek Powerhouse can be used to meet local demand. The Casa Diablo line can be de-energized to protect public safety, during extreme weather events, or to support maintenance activities like pole replacements or line upgrades.

The Casa Diablo line is the only source transmission line into the Mono Basin from the California ISO greater grid. The Rush Creek Powerhouse provides a local source of back-up power to June Lake, Lee Vining, Bridgeport, Mono City, and the U.S. Marine Corps Pickle Meadows Base should the Casa Diablo line be de-energized.

With the Rush Creek Powerhouse and Casa Diablo line operational, there is sufficient generation and capacity to meet local demands during both peak and off-peak conditions. If a new license is issued that removes Rush Creek Powerhouse or significantly curtails generation capacity, SCE would have approximately 2,200 local customers without power each time the Casa Diablo line is de-energized. Absent the Rush Creek Powerhouse to serve as backup power to local communities, there would be significant impacts to customers.

### 3.2.1 Power Demand

The North American Electric Reliability Corporation (NERC) is a regulatory authority whose mission is to assure the effective and efficient reduction of risks to the reliability and security of the power grid. NERC develops and enforces reliability standards; annually assesses seasonal and long-term reliability; monitors the bulk power system through system awareness; and educates, trains, and certifies industry personnel (NERC 2023).

There are seven regional entities given authority by the NERC. Of those entities, the Western Electricity Coordinating Council (WECC) is responsible for coordinating and promoting Bulk Electric System reliability in the Western Interconnection. The Western Interconnection includes all or portions of 14 western states, two Canadian provinces, and a portion of Baja California in Mexico. SCE's service area is within the California/Mexico sub region of the Western Interconnection.

According to WECC forecasts for the Western Interconnection, demand is projected to increase by approximately 7 percent from 2020 to 2029. The summer peak demand is expected to increase by 9 percent during that same period (WECC 2021). The region has a need for power over the near term, and power from the Project would continue to help meet that need in the future. In addition to underlying demand growth, uncertainty exists regarding projections of future energy demand and planned capacity increases due to ongoing changes in the electric industry's governing regulatory structure, changes in the resource mix (i.e., environmental regulations driving development of clean energy sources and increased reliance on natural gas), and in some years, climatic conditions such as higher temperatures, drought, and extreme weather.

### 3.2.2 California Legislation

Greenhouse gas (GHG) emissions are regulated in California, and California continues to pursue extensive climate change policies. On September 8, 2016, former Governor Jerry Brown signed Senate Bill (SB) 32, California Global Warming Solutions Act of 2006: emissions limit, which extends the state's target to reduce GHG emissions. SB 32 mandates a 40 percent reduction in GHG emissions below 1990 levels by 2030 and built upon the Assembly Bill 32 GHG reduction target to reduce GHG to 1990 levels by 2020. To achieve the SB 32 reductions, the plan is to increase renewable energy use, improve energy efficiency, get more zero-emission vehicles on California's roadways, and curb emissions from key industries.

In addition, SB 350, Clean Energy and Pollution Reduction Act of 2015, increases California's renewable electricity procurement goal from 33 percent by 2020 to 50 percent by 2030. In 2019, SB 100, The 100 Percent Clean Energy Act of 2018, set the California 2030 Renewables Portfolio Standard (RPS) requirement to 60 percent with the goal of becoming carbon neutral by 2045 (CARB 2019). Achieving this goal will increase the use of RPS eligible resources, including solar, wind, biomass, geothermal, and others. To help ensure these goals are met and GHG emission reductions are realized, large utilities were required to develop and submit integrated resource plans; these plans will detail how each utility will meet their customers resource needs, reduce GHG emissions, and ramp up the deployment of clean energy resources (CEC 2019). SCE has developed a plan called Pathway 2045 that outlines how SCE will meet carbon neutrality by 2045, which includes the continued operation of SCE's existing hydroelectric fleet (SCE 2019).

Energy generated by the Project reduces GHG emissions in California by displacing energy and other services that would otherwise be provided by gas-fired units. If the Project is not relicensed, SCE would need to obtain replacement from zero-emitting, firm (i.e., can generate power 24 hours per day / 7 days per week, when needed), RPS-eligible energy sources, which would require new facilities (see Exhibit H, Project Need and Key Information).

To summarize, energy produced from the Project is used by SCE to (1) meet current demand for energy in its service area; (2) meet renewable energy goals; and (3) provide a source of energy with low-GHG emissions.

In conclusion, power from the Project would help meet a need for power in the WECC in both the short and long-term. The Project provides low-cost power that displaces nonrenewable, fossil-fired generation, and contributes to a diversified generation mix.

## 3.3 REFERENCES

CARB (California Air Resources Board). 2019. Available at: https://ww2.arb.ca.gov/news/governor-newsom-announces-climate-pollution-continues-drop-below-2020-target-while-states.

CEC (California Energy Commission). 2019. Clean Energy and Pollution Reduction Act – SB 350. Available at: Clean Energy and Pollution Reduction Act - SB 350 (ca.gov).

NERC (North American Electric Reliability Corporation). 2023. NERC Website. Available at: https://www.nerc.com/Pages/default.aspx.

NSCE (Southern California Edison). 2019. Pathway 2045: Update to the Clean Power and Electrification Pathway. Available at: https://download.newsroom.edison.com/create_memory_file/?f_id=5dc0be0b2cfac24b300fe4ca&content_verified=True

WECC (Western Electricity Coordinating Council). 2021. Generation Resource Adequacy Forecast 2020-2029. Available at: https://www.wecc.org/ePubs/GenerationResourceAdequacyForecast.

## TABLE OF CONTENTS

Page

**4.0 No-Action Alternative .......... 4-1**

4.1 Project Overview .......... 4-1

4.1.1 Project Location .......... 4-1

4.1.2 Project Background .......... 4-2

4.2 Existing Project Facilities .......... 4-3

4.2.1 Rush Meadows Development .......... 4-4

4.2.2 Gem Development .......... 4-5

4.2.3 Agnew Development .......... 4-8

4.2.4 Rush Creek Powerhouse .......... 4-10

4.2.5 Water Conveyance System .......... 4-11

4.2.6 Power and Communication Lines .......... 4-12

4.3 FERC Project Boundary .......... 4-13

4.4 Project Operations .......... 4-14

4.4.1 Waugh Lake .......... 4-14

4.4.2 Gem Lake .......... 4-15

4.4.3 Agnew Lake .......... 4-15

4.4.4 Powerhouse .......... 4-16

4.5 Project Maintenance .......... 4-16

4.5.1 Powerhouse Inspection and Maintenance .......... 4-16

4.5.2 Powerhouse Complex Maintenance .......... 4-17

4.5.3 Flowline/Penstock and Valve House Inspections and Maintenance .......... 4-17

4.5.4 Dam Inspections, Testing, and Maintenance .......... 4-17

4.5.5 Tram Inspections and Maintenance .......... 4-18

4.5.6 Vegetation Management .......... 4-18

4.5.7 Woody Debris Removal .......... 4-19

4.5.8 Pest Management .......... 4-19

4.5.9 Trail Maintenance .......... 4-19

4.5.10 Power and Communication Line Maintenance .......... 4-19

4.6 Project Generation and Outflow Records .......... 4-20

4.6.1 Historic Dependable Capacity and Annual/Monthly Energy Production .......... 4-20

4.6.2 Current Dependable Capacity and Annual/Monthly Energy Production....4-20
4.6.3 Summary of Project Generation and Outflow (WY 2019–2023)....4-20
4.6.4 Regulatory Requirements....4-21
4.7 Existing Environmental Measures....4-21
4.7.1 Water Resources....4-21
4.7.2 Cultural Resources....4-22
4.7.3 Aquatic Resources....4-23
4.8 Project Safety....4-24
4.8.1 Owner's Dam Safety Program....4-24
4.8.2 Dam Inspections and Reporting....4-25
4.8.3 Emergency Action Plans....4-26
4.8.4 Public Safety Plan....4-27
4.9 References....4-28

## LIST OF TABLES

Table 4-1. Rush Creek Project Facilities....4-31

Table 4-2. Rush Creek Project Facility Specifications....4-35

Table 4-3. Summary of Recent Maintenance Activities and Emergency / Interim Modifications (1997–2023)....4-41

Table 4-4. FERC Elevation Requirements for Waugh, Gem, and Agnew Lakes, Including Current Seismic Restrictions....4-42

Table 4-5. FERC Instream Flow Requirements for the Rush Creek Project....4-43

Table 4-6. Monthly Mean and Maximum Flows (cfs) through Rush Creek Powerhouse (USGS Gage No. 10287300/SCE No. 367)....4-44

Table 4-7. Rush Creek Powerhouse Generation (Top) and Plant Capacity Factor (Bottom) (WY 1990–2023)....4-45

Table 4-8. Last 5-Year Monthly Rush Creek Power Generation (WY 2019–2023)....4-46

Table 4-9. Last 5-Year Monthly Average Rush Creek Powerhouse Flow (WY 2019–2023)....4-47

Table 4-10. Current License Requirements....4-48

## List of Figures


Figure 4-1. Rush Creek Project Elevation Profile ................................................4-55

Figure 4-2. Rush Creek Project Current Water Release Features .......................4-56

Figure 4-3. Rush Creek Project Transmission and Distribution Line Diagram .....4-57

Figure 4-4. Rush Creek Project Current Normal Operations ...............................4-58

Figure 4-5. Rush Creek Project Current High-Flow Operations...........................4-59

Figure 4-6. Rush Creek Project Reservoir Storage and Daily Mean Flow at the Rush Creek Powerhouse (USGS 10287300/SCE 367) (WY 1990–2006) .....................................................................................4-60

Figure 4-7. Historical Mean Daily Flows (WY 1999–2023) for Rush Creek Below Rush Meadows Dam (USGS 10287262/SCE 359R) and Waugh Lake Storage ........................................................4-62

Figure 4-8. Historical Mean Daily Flows (WY 1999–2023) for Rush Creek Below Gem Dam (USGS 10287281/SCE 352R) and Gem Lake Storage........................................................................................4-63

Figure 4-9. Historical Mean Daily Flows (WY 1990–2023) for Rush Creek Below Agnew Dam (USGS 10287289/SCE 357) and Agnew Lake Storage........................................................................................4-64

Figure 4-10. Rush Creek Monthly Power Generation for the Periods of WY 1990–2012 and WY 2012–2023......................................................4-65

Figure 4-11. Annual Rush Creek Power Generation (1990–2023)........................4-66


## List of Maps


Map 4-1. Project Vicinity and Land Jurisdiction ...............................................4-68

Map 4-2. Project Facilities and Land Jurisdiction............................................4-69

Map 4-3. Lands and Waters within the FERC Project Boundary by Township, Range, and Section .........................................................4-70

Map 4-4a. Project Facilities, Rush Meadows Dam/Waugh Lake........................4-71

Map 4-4b. Project Facilities, Rush Meadows Dam/Gem Lake ...........................4-72

Map 4-4c. Project Facilities, Gem Dam/Gem Lake............................................4-73

Map 4-4d. Project Facilities, Gem Dam Details ....................................................4-74
Map 4-4e. Project Facilities, Agnew Dam/Agnew Lake/Powerhouse ..................4-75
Map 4-4f. Project Facilities, Agnew Dam Details ................................................4-76
Map 4-4g. Project Facilities, Powerhouse Details................................................4-77

## LIST OF ACRONYMS

| | |
|---|---|
| ac-ft | acre-feet |
| CDFW | California Department of Fish and Wildlife |
| CFR | Code of Federal Regulations |
| cfs | cubic foot/feet per second |
| CRMP | Cultural Resources Management Plan |
| DSOD | Division of Safety of Dams |
| DSSMP | Dam Safety Surveillance and Monitoring Plan |
| DSSMR | Dam Safety Surveillance and Monitoring Report |
| EAP | Emergency Action Plan |
| FERC | Federal Energy Regulatory Commission |
| Forest Service | United States Forest Service |
| HP | horsepower |
| kV | kilovolt |
| kW | kilowatt |
| kWh | kilowatt-hour |
| MW | megawatt |
| NFS | National Forest System |
| ODSP | Owner’s Dam Safety Program |
| Project | Rush Creek Project |
| SCE | Southern California Edison Company |
| SHPO | State Historic Preservation Officer |
| USC | United States Code |
| USGS | United States Geological Survey |
| WY | water year |

# 4.0 NO-ACTION ALTERNATIVE

Under the No-Action Alternative, Southern California Edison Company (SCE) would continue to operate and maintain the Rush Creek Project (Project) under the terms and conditions of the current Federal Energy Regulatory Commission (FERC) license. This section was developed to meet the requirements for the description of the existing Project as specified in Title 18 of the Code of Federal Regulations (CFR) § 5.18(b)(4). The description of the No-Action Alternative is organized into the following major subsections:

- Project Overview
- Existing Project Facilities
- FERC Project Boundary
- Project Operations
- Project Maintenance
- Project Generation and Outflow Records
- Existing Environmental Measures
- Project Safety

## 4.1 PROJECT OVERVIEW

### 4.1.1 Project Location

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 (Map 4-1).

Most 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). The exception is an area around the Rush Creek Powerhouse, which is located on SCE-owned lands. A portion of the Project (Rush Meadows Dam, Waugh Lake, and Gem Lake) is located within the Ansel Adams Wilderness Area, designated by Congress as part of the Wilderness Act of 1964 (Public Law No. 88-577; 16 United States Code (USC) § 1132 note) and later as part of the California Wilderness Act of 1984 (Public Law No. 98-425; 16 USC § 1132 note). However, this infrastructure and FERC's licensing of this infrastructure as Project works predate the establishment of this wilderness area (Map 4-2 and Map 4-3). When the Wilderness Act was enacted, Congress protected existing private rights, including existing federally licensed hydropower projects. During the prior Project relicensing in the 1990s, both FERC and the Forest Service accepted the Project facilities as "non-conforming uses" because they were built before the establishment of the wilderness (FERC 1992).

Northeast of Agnew Dam, a 135-foot-long section of the 4-kilovolt (kV) Agnew Distribution Line, which powers Project facilities, crosses the Owens River Headwaters Wilderness Area (designated by Congress on March 31, 2009); however, no poles/towers are located within the wilderness area.

### 4.1.2 Project Background

The 13.01-megawatt (MW)[1] Project includes: three dams and associated reservoirs—Rush Meadows Dam (Waugh Lake), Gem Dam (Gem Lake), and Agnew Dam (Agnew Lake); a water conveyance system; the Rush Creek Powerhouse; and ancillary facilities. Rush Meadows Dam was completed in 1918, and subsequently raised in 1924 and 1925. Original construction of Gem Dam was completed between 1915 and 1917, and an additional gravity section was added in 1924. Construction of Agnew Dam was completed between 1915 and 1917.

The three Project reservoirs historically provided storage for lake recreation during the summer and allowed for electricity generation at the Rush Creek Powerhouse. Water exiting the powerhouse enters a short tailrace and is returned to Rush Creek upstream of Silver Lake. Refer to Maps 4-4a–g for detailed maps depicting the FERC Project boundary and major Project facilities. Figure 4-1 provides an elevation profile of the Project.

#### 4.1.2.1 Seismic Restrictions

Due to the Silver Lake Fault being identified as a potential safety concern in 2007, SCE conducted fault studies, structural testing, and engineering analyses of Agnew, Gem, and Rush Meadows dams. Early testing focused on Rush Meadows and Gem dams. The results of the analysis indicated a potential dam safety issue when the reservoirs are full and there is a large seismic event (earthquake). As such, SCE filed a request with FERC for a temporary variance in the minimum storage level requirements for Waugh and Gem lakes (SCE 2012). FERC approved the request to limit Waugh Lake to an elevation of 9,392.1 feet and Gem Lake to an elevation of 9,027.5 feet to address seismic concerns. The approval stated that SCE may not refill the reservoirs above the seismic restrictions until authorization is received from FERC (FERC 2012).

In 2013, FERC approved SCE's request for temporary variance to keep Agnew Lake completely drained to address seismic concerns. The approval stated that Agnew Lake will not be refilled until FERC finds that the dam is safe with a full reservoir under seismic loading (FERC 2013).

Since 2013, FERC has filed numerous letters stating that SCE shall retain the reservoir restrictions at the three reservoirs until FERC formally notifies SCE otherwise. Most recently, on October 27, 2016, FERC issued a letter directing SCE to maintain the reservoirs at Rush Meadows, Gem, and Agnew dams at or below the agreed-upon

[1] The FERC authorized capacity is 11.85 MW.

restricted reservoir elevations until further notice (Waugh Lake – 9,392.1 feet; Gem Lake – 9,027.5 feet; and Agnew Lake – completely drained) (FERC 2016a).

As a result of the seismic restrictions placed on the Project, in 2014 SCE began consulting with FERC and various resource agencies to discuss engineering and licensing process options for developing a comprehensive long-term solution to address the seismic concerns, including consideration of dam retrofitting and/or decommissioning.

In 2016/2017, the Rush Creek Watershed experienced 220 percent of the average snowpack resulting in unprecedented high-runoff conditions. Prior to runoff, SCE determined the restricted reservoir elevations at Waugh, Gem, and Agnew lakes could not be maintained through normal Project operations of outlet valves and penstock releases. To address the seismic restrictions and alleviate safety concerns as required by FERC (Division of Dam Safety and Inspections) and the California Department of Water Resources (Division of Safety of Dams [DSOD]), SCE implemented emergency actions in 2017 and additional interim structural modifications in 2017–2018 and 2020–2021, as summarized below:

- Emergency Actions (2017) – Installed a temporary pumping system to remove water from Agnew Lake and modified the Gem and Agnew flowlines to manage lake elevations more effectively.
- Interim Structural Modifications (2017–2018) – Notched the base of Agnew Dam (2017) and Rush Meadows Spillway (2018) to pass higher flows downstream and passively comply with the seismic restrictions.
- Interim Structural Modifications (2020–2021) – Retrofitted the existing Gem Dam Arch No. 8 outlet valve to improve hydraulic characteristics of the valve and increase flow releases at the Arch No. 8 outlet.

## 4.2 EXISTING PROJECT FACILITIES

This section describes Project facilities (from upstream to downstream), including dams and lakes; water conveyance systems; the powerhouse; gages; power and communication lines; and support facilities. A list of Project facilities is provided in Table 4-1. A summary of the physical characteristics/specifications of the primary Project facilities is provided in Table 4-2. Refer to the following maps for geographic depictions of the Project vicinity (Map 4-1); land jurisdiction (Map 4-2); public land survey system (township, range, and section) (Map 4-3); and Project facility locations (Map 4-4a-g). A general elevation profile of the Project is shown on Figure 4-1. Subsequent to issuance of the current license in 1997, several maintenance activities and emergency/interim modifications to Project facilities were implemented. For maintenance/modification activities located within the Ansel Adams Wilderness Area, SCE obtained authorization from the Forest Service, as identified in Table 4-3.

Information for this section was developed from the current FERC license (FERC 1997); Exhibit A (SCE 2013a), Exhibit F (SCE 2013b), and Exhibit G (SCE 2009) for the Project; and Historic American Engineering Records (SCE 2013c, 2013d, 2013e). Information regarding Project modifications was obtained from final reports filed with resource agencies following construction activities (SCE 2017, 2018).

### 4.2.1 Rush Meadows Development

#### 4.2.1.1 Rush Meadows Dam

Rush Meadows Dam is a concrete radial-arch structure. The dam was originally constructed in 1918 and was subsequently raised in 1924 and 1925 to its current height and storage capacity. The crest is 463 feet long and located at 9,418.6 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, which prior to 2018 was a 55-foot-long ungated notch 3 feet lower than the crest, at an elevation of 9,415.6 feet.

In 2018, a notch was constructed in the spillway to increase its capacity to facilitate compliance with the FERC-mandated reservoir elevation restrictions during high-runoff years (FERC 2012, 2016a). A 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. In a letter dated February 7, 2020, and following the final inspection of work at Rush Meadows Dam, DSOD issued an amended Certificate of Approval for the dam that revised the terms and conditions to read "water may be impounded to elevation 9,395.60, National Geodetic Vertical Datum 29 Datum, the crest of the spillway notch." DSOD concluded that the spillway notch adequately mitigates the seismic stability concerns with Rush Meadows Dam, and DSOD lifted its reservoir restriction imposed on February 14, 2013, and updated the condition assessment of the dam from "Fair" to "Satisfactory" (DSOD 2020).

A concrete inlet chamber is located off-center at the base of the upstream side of the dam. The upstream face of the inlet chamber contains a pair of 6-foot-wide metal grates. Behind the grates, two slide gates installed in the dam face control the flow of water into two steel outlet pipes (the right outlet is circular with a 24-inch diameter and the left outlet is square with sides measuring 30 inches) located at an elevation of 9,368.6 feet. On the downstream side of the dam, there is a valve house and both outlet pipes discharge into Rush Creek, which flows into Gem Lake.

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.[2]

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

#### 4.2.1.2 Waugh Lake

As originally designed and constructed, Rush Meadows Dam impounded Waugh Lake, a 185-acre reservoir with a storage capacity of 5,277 acre-feet (ac-ft). However, since 2012, as required by FERC, Waugh Lake has been limited to an elevation of 9,392.1 feet to meet seismic restrictions and alleviate safety concerns (FERC 2012, 2016a), resulting in a 130-acre reservoir with a storage capacity of 1,555 ac-ft. Operations of Waugh Lake are discussed in greater detail in Section 4.4.

#### 4.2.1.3 Gages

The following gages measure stream flow and reservoir elevation in the vicinity of Rush Meadows Dam:

- Rush Creek below Rush Meadows (Waugh Lake) (United States Geological Survey [USGS] No. 10287262; SCE No. 359R) – Stream gage located approximately 160 feet downstream of Rush Meadows Dam

- Waugh Lake (USGS No. 10287260; SCE No. 359) – Reservoir gage located in gage house adjacent to north abutment of dam

#### 4.2.1.4 Trail

The Rush Meadows Dam Access Trail (Project trail) extends approximately 160 feet from the Rush Creek Trail (non-Project trail) providing access to the dam and ancillary facilities adjacent to the north side of the dam.

#### 4.2.1.5 Ancillary Facilities

Ancillary Project facilities associated with the Rush Meadows Development are located downstream of the dam adjacent to the north abutment, and include:

- Equipment shed

- Gage house

- Solar facility

### 4.2.2 Gem Development

#### 4.2.2.1 Gem Dam

Gem Dam is a reinforced concrete multiple-arch structure. The dam was originally constructed from 1915–1917, with an additional gravity section added in 1924. The crest is 688 feet long and located at 9,057.5 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 comprises 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. The northern-most partial arch is not numbered. The remaining arches are designated from north to south as Arches No. 1 to No. 17.

Two spillways are located at the south end of the dam. The partial arch segment at the south abutment (Arch No. 17) contains the upper spillway at 9,053.64 feet in elevation, comprising five rectangular openings, each approximately 5 feet wide and 2 feet high, arranged in a horizontal row just below the crest of the dam. The adjacent arch segment (Arch No. 16) contains the lower spillway, consisting of a row of eight identical openings approximately 5 feet wide and 2 feet high, set 2 feet lower than the upper spillway at 9,051.63 feet in elevation.

A 48-inch-diameter, steel flowline from Gem Lake Intake passes beneath the dam structure (Arch No. 3) and conveys water to the Agnew Junction. From the Agnew Junction, water is conveyed via penstock(s) to the Rush Creek Powerhouse. Refer to Section 4.2.5 for a discussion of the Project's water conveyance system.

A 36-inch-diameter low-level outlet pipe (8,985 feet in elevation) installed at the base of the dam (Arch No. 8) is used to pass high flows downstream and release water to maintain the minimum instream flow requirements in the existing license. The upstream end of the outlet pipe is covered by a grate. The downstream end of the pipe passes through a small, galvanized iron valve house and terminates at an anchor block, situated on a concrete footing at the base of the dam. Water is discharged from the low-level outlet into Rush Creek, which flows into Agnew Lake.

In 2020 and 2021, SCE upgraded the Arch No. 8 outlet valve, discharge pipe, and associated electrical work to improve hydraulic characteristics of the valve and allow for higher flow releases from Gem Lake into Rush Creek to facilitate compliance with the seismic restricted reservoir elevation during high-runoff years. The Arch No. 8 outlet valve was retrofitted with a 36-inch knife gate fitting, and the existing 36-inch-diameter discharge pipe was replaced with a 54-inch-diameter pipe.

Below Gem Dam, the existing license requires a continuous minimum flow of 1 cfs or natural flow when the level of Gem Lake falls below the face of the dam.[3]

#### 4.2.2.2 Gem Lake

As originally designed and constructed, 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 and alleviate safety concerns (FERC 2012, 2016a), resulting in a 256-acre reservoir with a storage capacity of 10,752 ac-ft. Operations of Gem Lake are discussed in greater detail in Section 4.4.

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

#### 4.2.2.3 Gages

The following gages measure stream flow and reservoir elevation in the vicinity of Gem Dam:

- Rush Creek below Gem Lake (USGS No. 10287281; SCE No. 352R) – Stream gage located downstream of the dam
- Gem Lake (USGS No. 10287280; SCE No. 352) – Reservoir gage located at the Gem Valve House

#### 4.2.2.4 Tramway

The Gem Tram, an approximately 1,490-foot-long (0.28 mile) incline railroad, is used to transport personnel and minor equipment and material between the Upper Agnew Boathouse/Dock on the southwestern shore of Agnew Lake and the Gem Tram Hoist House located near the south abutment of Gem Dam.

The Gem Tram includes upper and lower landings that provide areas for loading/unloading of personnel and equipment/material near the dam crest and near the base of the dam. The upper landing is located near the south abutment of the dam adjacent to the hoist house, and the lower landing is approximately 275 feet below the hoist house and south of the cookhouse. Adjacent to the lower landing, the tram includes a bridge over Rush Creek. During high flows in 2017, a portion of the Gem Tram was washed out. Gem Tram is also restricted because the power line to the dam was removed for fire mitigation purposes. The tram is currently not operational until repairs can be implemented.

#### 4.2.2.5 Trails

The following Project trails are used to access facilities located in the vicinity of Gem Dam:

- Lower Gem Dam Access Trail – 980-foot-long Project trail that extends from Rush Creek Trail (non-Project trail) to the Gem Tram Lower Landing. This trail includes a footbridge adjacent to the lower tram landing.
- Gem Dam Arch 8 Access Trail – 120-foot-long Project trail that extends from the Lower Gem Dam Access Trail (near the Bunkhouse) to the Arch No. 8 Valve House.
- Upper Gem Dam Access Trail – 430-foot-long Project trail that extends from the Lower Gem Dam Access Trail (near the cookhouse) to the south abutment of the Dam. This trail includes a footbridge over Rush Creek.

#### 4.2.2.6 Ancillary Facilities

Ancillary Project facilities associated with the Gem Development include:

- The Gem Valve House and Cabin includes personnel housing on the main floor and the valve house on the bottom floor (i.e., basement).

- The Gem Valve House Tunnel provides access from the Gem Cabin to the bypass valve controls on the flowline.

- The Gem Bunkhouse, Outhouse, and Cookhouse provide accommodations/ support facilities for personnel.

- Gem Weather Station and Satellite Dish located between the Gem Valve House/Cabin and the Bunkhouse. The weather station records meteorological data, and the satellite dish is used to support communication.

- The Gem Solar Facility located at the Gem Valve House and Cabin powers control and metering devices.

- Gem Lake Dock is located near the south abutment of the dam and stores the Gem Lake Motor Barge,[4] which is used to transport personnel and equipment across the lake.

- A compressor shed and storage shed located near 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.

### 4.2.3 Agnew Development

#### 4.2.3.1 Agnew Dam

Agnew Dam, constructed between 1915 and 1917, is a reinforced concrete, multiple-arch structure. The crest is 278 feet long and located at 8,498.9 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 comprises 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 in Arches No. 5 and No. 6. Each spillway comprises 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 8,495.88 feet in elevation.

The inlet works is a concrete chamber built against the base of the upstream face, between Arches No. 4 and No. 5, at an elevation of 8,470 feet. The sloping upstream face of the chamber is approximately 16 feet wide by 20 feet long. The opening of the chamber is covered with a steel grate that is approximately 13 feet wide by 17 feet long. The

[4] In accordance with revised Forest Service 4(e) Condition No. 8 (November 30, 1999), the Gem Lake Motor Barge may be used on an as-needed basis for routine operation and maintenance purposes within the Ansel Adams Wilderness Area.

chamber is connected to a 30-inch-diameter, steel outlet pipe (8,470 feet in elevation) that passes through the base of the dam at Arch No. 4. This outlet pipe is the intake to the Agnew Flowline and is controlled by a butterfly valve located in an enclosure immediately downstream of the dam. Historically, water was conveyed through the flowline to the Agnew Junction. From Agnew Junction, water was conveyed via penstock into the Rush Creek Powerhouse. Refer to Section 4.2.5 for a discussion of the Project's water conveyance system and modifications made to the Agnew Flowline in 2017.

In 2017, two rectangular notches measuring 6 feet 2 inches wide by 5 feet high were cut in Agnew Dam at the base of Arches No. 5 and No. 6 (base of notch is 8,472 feet in elevation) to allow the reservoir to pass high flows downstream to facilitate compliance with the FERC-mandated reservoir elevation restrictions (FERC 2012, 2016a). In addition, SCE constructed two buttress walls on the downstream side of each notch to provide additional stability and prevent downcutting or scour behind the dam. Currently, the flowline intake is closed and the new notches at the dam are used to meet minimum instream flow requirements in the existing license and pass high flows downstream.

Below Agnew Dam, the existing license requires a continuous minimum flow of 1 cfs or natural flow when the level of Agnew Lake falls below the face of the dam.[5]

#### 4.2.3.2 Agnew Lake

As originally designed and constructed, 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 (FERC 2013, 2016a). No storage is available at Agnew Lake for Project generation. Operations of Agnew Lake are discussed in greater detail in Section 4.4.

#### 4.2.3.3 Gages

The following gages measure stream flow and reservoir elevation in the vicinity of Agnew Dam:

- Rush Creek below Agnew Lake (USGS No. 10287289; SCE No. 357) – Stream gage located approximately 600 feet downstream of Agnew Dam at the Project flume

- Agnew Lake (USGS No. 10287285; SCE No. 351) – Reservoir gage located at the Agnew Boathouse

#### 4.2.3.4 Tramway

The Agnew Tram, an approximately 4,280-foot-long (0.81 mile) incline railroad, is used to transport personnel and equipment between Rush Creek Powerhouse and the Agnew Tram Hoist House located at the north abutment of Agnew Dam. The Agnew Tram

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

Landing (500 feet below the hoist house) is located adjacent to the Agnew Cabin and is used for loading/unloading of personnel and minor equipment and material. A barge provides for transport of personnel and equipment/material across Agnew Lake to the Gem Tram. The tram is currently not operational until repairs can be implemented.

#### 4.2.3.5 Trail

The Agnew Stream Gage Access Trail (Project trail) extends approximately 170 feet from the Rush Creek Trail (non-Project trail) to the Project gaging station/flume.

#### 4.2.3.6 Ancillary Facilities

Ancillary Project facilities associated with the Agnew Development include:

- Agnew Cabin located south of the dam provides personnel housing.
- Agnew Weather Station located on the southwest side of Agnew Cabin records meteorological data.
- Agnew Flume is located approximately 500 feet downstream of Agnew Dam and facilitates flow measurements (gaging) in Rush Creek.
- Lower Agnew Lake Boathouse/Dock is located near the north abutment of the dam. Historically, the Agnew Lake Motor Barge was stored here and was used to transport personnel and equipment across the lake.
- Upper Agnew Lake Boathouse/Dock located on the southwest end of the lake provides access to the Gem Tram.

### 4.2.4 Rush Creek Powerhouse

The Rush Creek Powerhouse (constructed from 1915–1922) is located on an approximately 10-acre complex on SCE-owned lands. The powerhouse, located at an elevation of 7,253 feet, is a two-story concrete structure that is approximately 40 feet wide by 80 feet long by 63 feet high. The powerhouse contains two single-overhung, single-jet, impulse turbines (Pelton water wheel) rated at a total of 16,515 horsepower (HP) (Unit No. 1 – 8,515 HP; Unit No. 2 – 8,000 HP); two horizontal-shaft generator units with a total installed capacity of 13,010-kilowatts (kW) (Unit No. 1 – General Electric, 5,850-kW; Unit No. 2 – Allis Chalmers, 7,161-kW). The powerhouse is equipped with one 20-ton overhead crane and a 2-ton secondary crane, which provide hoisting capability for all major equipment. Refer to Table 4-2 for additional specifications.

A 150-foot-long, 2.4-kV distribution line (Project facility) conveys power from the powerhouse turbines to the switchyard (non-Project facility) when the Project is generating electricity and from the switchyard to the powerhouse when the Project is not generating (refer to Section 4.2.6).

From the Agnew Junction, two 28-inch-diameter steel penstocks convey water to the west side of the powerhouse and connect to the turbines. From the east side of powerhouse, a 470-foot-long tailrace returns water to Rush Creek. USGS Gage No. 102873000/ SCE No. 367 is located on the west wall and records flow through the powerhouse.

The powerhouse complex is accessed via the Rush Creek Powerhouse Complex Access Road, a Project road. Two gated entry points are available off of State Route 158. The powerhouse complex also includes various ancillary facilities that support Project operations, including:

- Cottages
- Garages
- Warehouse and loading dock
- Machine shop
- Pump house
- Woodsheds
- Helicopter landing site
- Propane tank
- Bridges over the powerhouse tailrace and Rush Creek

### 4.2.5 Water Conveyance System

This section includes a description of the current water conveyance system, which SCE modified in 2017 to facilitate compliance with the seismic restrictions. Refer to Figure 4-2 for a depiction of the current water conveyance system. The figure depicts previously existing features in blue, new or modified features in red, and non-functional features in brown.

Water captured in Waugh Lake is released directly into Rush Creek and flows downstream into Gem Lake; no Project water conveyance system is associated with Waugh Lake / Rush Meadows Dam. Water captured in Gem Lake can be either conveyed via Project flowlines and penstocks to the Rush Creek Powerhouse or released into the natural stream channel from low-level outlets and/or flowline valves.

From Gem Dam, water can be conveyed through a 48-inch-diameter riveted-steel flowline downhill approximately 4,584 linear feet to the Agnew Junction. The flowline from the reservoir to the Agnew Junction is completely underground. Water can also be released from the Arch No. 8 Outlet and minimum instream flow release pipe at the base of the dam; a bypass flowline just downstream of the dam; and from a pressure release valve or new 18-inch valve located just upstream of Agnew Junction. The new 18-inch valve was installed in 2017 at an existing flange in the Gem Flowline to maximize outflows and reduce reservoir levels of Gem Lake.

From Agnew Dam, historically, water was conveyed through a lap welded, 30-inch-diameter steel flowline downhill approximately 575 linear feet to the Agnew Junction. Along the flowline between Agnew Dam and Agnew Junction, a release valve was used to provide the minimum instream flow requirements downstream of the dam, and a drain valve was used to draw down the reservoir. The flowline from Agnew Dam includes sections that are both above ground and below ground.

In 2017, SCE modified the Agnew Flowline to release additional water from the reservoir (emergency action) due to the high projected runoff (220 percent of the average snowpack). The bottom of the Agnew Flowline was cut in two places to maximize outflows and expedite lowering of Agnew Lake. The Agnew Dam was also modified, as discussed in Section 4.2.3.1. Currently, the flowline intake is closed, and the new dam notches are used to meet minimum instream flow requirements in the existing license and pass high flows downstream.

At the Agnew Junction, water from the Gem Dam Flowline can enter either the penstock for Powerhouse Unit No. 1 or No. 2. Historically, water from the Agnew Dam Flowline could only enter the penstock for Powerhouse Unit No. 1. However, due to the Agnew Flowline modification in 2017 and the seismic restriction, no water from Agnew Lake is available for generation.

From the Agnew Junction, two parallel, 30-inch to 28-inch-diameter welded steel penstocks convey water 4,280 linear feet to the powerhouse. From Agnew Junction, both penstocks are underground until 75 feet before entering the Rush Creek Powerhouse where they become visible.

### 4.2.6 Power and Communication Lines

A 150-foot-long, 2.4-kV distribution line (Project facility) conveys power from the powerhouse turbines to the switchyard[6] (non-Project facility) when the Project is generating electricity and from the switchyard to the powerhouse when the Project is not generating. Refer to Figure 4-3 for a schematic showing the Project’s transmission and distribution system (Project and non-Project features).

The Rush Creek Powerhouse is used to respond to California Public Utility Commission and California Independent System Operator demands for power. Demands can be market driven (i.e., energy needs and renewable load), or used to stabilize the grid. When the source transmission line is de-energized (115-kilovolt Casa Diablo line), the Rush Creek Powerhouse can be used to meet local demand. The Casa Diablo line can be de-energized to protect public safety, during extreme weather events, or to support maintenance activities like pole replacements or line upgrades. The Casa Diablo line is

[6] Adjacent to the powerhouse, the transformer, switchyard, substation, and 115-kV transmission lines are non-Project facilities.

the only source transmission line into the Mono Basin from the California Independent System Operator greater grid.

Historically, the 1.59-mile-long 4-kV Agnew Distribution Line extended between the Rush Creek Powerhouse and Gem Dam, including a 0.78-mile-long segment to Agnew Dam and a 0.81-mile-segment that continued to Gem Dam. The line also includes two tap lines—one to Agnew Dam (200 feet long) and the other to the Upper Agnew Boat Dock (620 feet long).

In 2019, SCE inspected the Agnew 4-kV circuit, which revealed the circuit needed repairs. Until such time that the repairs can be made, the circuit was de-energized in 2020 from Agnew Dam to Gem Dam (0.81-mile segment) via the removal of the conductor from Tower 13 to Tower 20. While the conductor was removed, currently the towers are still in place. To temporarily supply power to Gem Dam and associated facilities, SCE installed a solar/battery system that includes solar arrays, batteries and inverter, backup generator system, and propane tanks.

The 0.78-mile-long segment of the Agnew 4-kV line from the Rush Creek Powerhouse to Agnew Dam is still in service and distributes power to the dam appurtenances. The tap line to the Upper Agnew Boat Dock was de-energized but not physically removed.

The Communication Line from Rush Creek Powerhouse to Gem Lake Dam (approximately 1.63 miles long) is the main Project communication line. From the Rush Creek Powerhouse, the line runs above ground and alongside the Agnew Tram tracks to the Agnew Tram Hoist House. From the Agnew Tram Hoist House, the line continues across Agnew Lake in an armored plastic conduit on the bottom of the lake to the Upper Agnew Lake Boathouse/Dock. From the Upper Agnew Lake Boathouse/Dock, the communication line runs above ground and alongside the Gem Tram tracks to the Gem Tram Hoist House. The following spurs extend from the main line:

- Communication Line from Agnew Hoist House to Agnew Boathouse (170 feet long)
- Communication Line from Gem Tram Hoist House to Gem Valve House (510 feet long)
- Communication Line from Gem Valve House to Arch No. 8 Valve House (240 feet long)

## 4.3 FERC Project Boundary

A list of Project facilities necessary for operation and maintenance of the Project is provided in Table 4-1. Geographic Information System maps illustrating the location of existing Project facilities in relationship to the current FERC Project boundary are provided in Maps 4-4a–g. All Project facilities are within the FERC Project boundary.

Under the No-Action Alternative, the FERC Project boundary encompasses 720 acres, including 688 acres of public lands administered by the Forest Service and 32 acres of

SCE-owned land (including the 10-acre powerhouse complex). No tribal lands are within the FERC Project boundary.

## 4.4 Project Operations

Project operations are described for two periods: (1) Historical Operations (water years [WY] 1990–2011), prior to implementation of reservoir elevation restrictions; and (2) Current Operations (WY 2012–2023), post-implementation of the reservoir elevation restrictions. Figures 4-4 and 4-5 depict current normal operations and high-flow operations associated with the Project.

Historical and current FERC elevation requirements for the Project reservoirs is provided in Table 4-4. Current FERC minimum flow release requirements are provided in Table 4-5. Reservoir storage for each of the Project reservoirs and powerhouse operations from WY 1990 through 2023 are provided in Figure 4-6. Reservoir elevations and minimum flow releases are provided in Figures 4-7, 4-8, and 4-9.

### 4.4.1 Waugh Lake

Historically, the low-level outlets for Rush Meadows Dam were closed and Waugh Lake began filling between late April and mid-June depending on Rush Creek inflow and weather conditions affecting access to the facilities (Figure 4-6). Waugh Lake typically began filling about 2.5 weeks after Gem Lake, the larger downstream reservoir, began filling. Waugh Lake typically filled to the spillway elevation (5,100 ac-ft; 9,415.6 feet elevation) or greater each year (storage increased above the spillway elevation during spill events). Storage was then maintained to the extent sufficient water was available to meet minimum stream flow requirements in Rush Creek below Waugh (10 cfs or natural inflows, if less) (Figure 4-7; Table 4-5) from July 1 through the Tuesday following Labor Day weekend, at which point the storage was released into Rush Creek and Gem Lake for generation. The reservoir low-level outlets were then left open through winter and early spring (no storage and no water on the dam face).

Under current operations, Waugh Lake storage is maintained below the seismic restrictions, to the extent possible, given the spillway and low-level outlet capacity and the magnitude of inflows (Figures 4-6 and 4-7). During the winter and early spring, the reservoir is drained, and the low-level outlets are left open. Since approximately 2017, the low-level outlets have generally been left open year-round. The notching of the spillway in 2018 facilitates compliance with the FERC-mandated reservoir elevation restrictions. During high spring inflows that exceed the low-level outlet capacity, storage can accumulate in the reservoir to the level of the notched spillway. When inflow subsides, the reservoir drains through the open low-level outlets.

Storage releases from Rush Meadows Dam travel down Rush Creek into Gem Lake. The releases are measured at USGS Gage No. 10287262/SCE No. 359R. Data from 2000 to 2009 for the USGS record are spotty because they are reported only when flows are below 30 cfs (note that the gage is a minimum flow gage rated up to approximately 30 cfs) (Figure 4-7). All the data for the later years (2010–2023) are shown on Figure 4-7, even data above the official gage rating, by plotting the SCE recorded data.

### 4.4.2 Gem Lake

Historically, Gem Lake began filling in the spring between early April and late May, depending on the Rush Creek inflow. Gem Lake would typically fill up to the spillway elevation (17,000 ac-ft; 9,051.63 feet elevation) or greater (storage increased above the spillway elevation during high-flow events). Storage would be maintained consistent with the July 1 through Labor Day weekend recreation requirements to the extent sufficient water was available to meet minimum stream flow requirements in Rush Creek below Gem Lake and, in low water years, a target 14[7] cfs release from the powerhouse, based on FERC requirements (Figure 4-6; Table 4-4). Typically, the reservoir elevation was maintained until Waugh Lake was fully drained and then Gem Lake was lowered until either (1) spring flows triggered refill the following year or (2) the storage dropped to between 1,000 to 4,000 ac-ft.

Under current operations, Gem Lake fills to the maximum seismic restriction capacity of approximately 10,752 ac-ft (9,027.5 feet elevation) and maintains storage through the summer (Figure 4-6, Figure 4-8, and Table 4-4). Most of the storage is released in the fall/winter and the reservoir refills during high spring flows the following year.

Releases from Gem Lake, not including spills, are either diverted into the Rush Creek Powerhouse or travel downstream in Rush Creek to Agnew Lake (1 cfs minimum flow release). A minimum flow gage (USGS No. 10287281/SCE No. 352R) is located downstream of Gem Dam, but it does not capture reservoir spills (Figure 4-8).

### 4.4.3 Agnew Lake

Historically, Agnew Lake began filling in the spring between approximately late March and early June, depending on Rush Creek inflow. Agnew Lake would then remain filled consistent with the July 1 through Labor Day weekend license requirement (within 15 feet of the spillway elevation; 8,496 feet [1,379 ac-ft]). Typically, maximum storage was maintained, to the extent sufficient water was available to meet minimum stream flow requirements in Rush Creek below Agnew Lake (Table 4-4), until approximately the second week of October and after Waugh Lake was fully drained. At this point, Agnew storage would be released until the water level dropped to near the level of the intake at 8,470.0 feet.

Under current operations, Agnew Lake is no longer used for storing water or power generation. Water entering the lake flows unimpeded through the two notches in the base of the dam and flows into Rush Creek, eventually entering Silver Lake. Agnew was a natural lake prior to construction of the dam. The natural lake has a maximum elevation

[7] Fourteen cfs is the plant minimum operation target identified in the FERC license requirements for Gem Lake storage.

of 8,470 feet and gross storage of 569 ac-ft. This storage is not available for power production.

USGS Gage No. 10287289/SCE No. 357 records flow in Rush Creek below Agnew Lake (Figure 4-9).

### 4.4.4 Powerhouse

Historically, flows were provided to the Rush Creek Powerhouse (USGS Gage No. 10287300/SCE No. 367) from both Gem Dam and Agnew Dam flowlines/penstocks. Flow varied from approximately zero to 110 cfs (both units operating), depending on water availability and releases from the dams (Figure 4-6 and Table 4-6). Monthly average flows for the WY 1990–2011 period ranged from 34.7 to 62.5 cfs, with the highest flows in June and July and the lowest flows in the winter and early spring (Table 4-6). Powerhouse generation is described in Section 4.6.

Currently, flow is provided to the Rush Creek Powerhouse (USGS Gage No. 10287300/SCE No. 367) from only the Gem Dam Flowline. Flows vary from approximately zero to 110 cfs (both units operating), depending on water availability (Figure 4-6 and Table 4-6). During some periods/years, flows remain relatively steady for multiple weeks at a time and at other times, flows fluctuate daily. Monthly average flows for the WY 2012–2023 period ranged from 16 to 67 cfs, with the highest flows in June and July and the lowest flows in the fall, winter, and early spring (Table 4-6). Powerhouse generation is described in Section 4.6.

## 4.5 PROJECT MAINTENANCE

This section describes routine inspection and maintenance activities conducted for the Project. Routine inspections are conducted at Project facilities to verify the structural and/or functional integrity of the facilities and to identify conditions that might disrupt operation or threaten public safety. Routine maintenance activities are conducted to maintain Project facilities in safe and operational conditions. A description of each activity is provided in the following subsections.

### 4.5.1 Powerhouse Inspection and Maintenance

SCE conducts an annual maintenance outage at the powerhouse. The maintenance outage typically occurs in the fall and lasts up to two weeks. During the outage, SCE conducts comprehensive mechanical and electrical inspections, testing, and maintenance of the powerhouse appurtenances. In conjunction with the powerhouse maintenance outage, SCE also makes any repairs to Project penstocks, as appropriate.

SCE performs daily inspections of all powerhouse appurtenances to ensure they are operating properly. Minor maintenance and repairs to powerhouse appurtenances are made on an as-needed basis.

### 4.5.2 Powerhouse Complex Maintenance

Repairs to other buildings and ancillary facilities located within the powerhouse complex are made on an as-needed basis, including painting, building maintenance, and access road/bridge repairs.

### 4.5.3 Flowline/Penstock and Valve House Inspections and Maintenance

SCE conducts quarterly physical inspections (weather permitting) of the exterior of flowlines/penstocks (including valves, air valves, releases, and standpipe) and valve houses. Minor repairs, including patching leaks and conducting valve house repairs (e.g., applying new paint, siding, and/or roofing) are made on an as-needed basis. Inspection of flowline/penstock interiors is conducted by either physical inspection and/or use of cameras, depending on the section length and location, during the annual maintenance outage when they are dewatered.

### 4.5.4 Dam Inspections, Testing, and Maintenance

To identify routine maintenance needs, SCE visually inspects all dams and appurtenances monthly, including:

- Geomembrane liners
- Concrete
- Ancillary and support facilities
- Handrails and gates
- Paint
- Gaging stations and houses (e.g., painting, roofing)

In addition, SCE conducts the following inspections and maintenance activities at Project dams:

- Annually, when lakes are drained, typically in the spring, intake grates are manually cleaned to remove accumulated material.
- Annually, valves/low-level outlets are inspected and tested by partial opening the values.
- Every 5 years, valves/low-level outlets are fully opened for testing.

Refer to Section 4.8 for additional information on FERC inspections and Independent Consultant Safety inspections completed for the Project.

### 4.5.5 Tram Inspections and Maintenance

The Agnew and Gem trams (including tracks, ties, rollers, and cables) are inspected weekly when operational (approximately late May to late September) to ensure the tracks are clear and have no excess wear. The following maintenance activities are completed as needed:

- Hand clearing vegetation that has encroached on the tracks;
- Replacing or repositioning ties; and
- Replacing rollers and cables.

Tram cars, hoists, and hoist houses are inspected annually, and repairs are made as necessary.

### 4.5.6 Vegetation Management

Vegetation management is implemented at Project facilities as necessary to control vegetation that may affect access, functionality of facilities, fire risk, or worker/public health and safety. Vegetation management includes hand trimming, removing hazard trees, and applying herbicide.

**Hand Trimming**: Hand trimming vegetation includes trimming grasses and forbs with a string trimmer and trimming shrubs and trees with a chainsaw, other handheld saw, or pruners. These activities are implemented on an as-needed basis.

Hand trimming occurs in the following areas:

- Within 5 feet on either side of Project access trails.
- Within 10 feet on either side of power and communication lines.
- Within 2 feet on either side of tram tracks.
- Within 5 feet on either side of exposed flowlines/penstocks.
- Within the powerhouse complex.

**Removing Hazard Trees**: Hazard trees, generally defined as trees with defects that may cause a failure resulting in property damage, personal injury, or death, are removed on an as-needed basis. Removal is conducted with a chainsaw, handheld saw, or other equipment.

**Applying Herbicides**: Herbicides are used to control weeds and vegetation encroachment and are applied using a small handheld sprayer. They are used in accordance with label instructions by a licensed vendor on SCE-owned lands. Herbicides are not applied on Forest Service lands. Herbicide use only occurs inside the powerhouse substation perimeter fence and 10 to 15 feet outside the fence to control weeds and vegetation encroachment.

### 4.5.7 Woody Debris Removal

SCE removes woody debris that builds up along the dams and has the potential to block spillways and low-level outlets. Woody debris is generally removed as follows:

- **Rush Meadows Dam**: Historically, woody debris was manually moved upstream of the dam to a location where it could be cut up into manageable pieces and secured on the bank.[8] With the newly modified spillway, and in accordance with SCE's approved Debris Management Plan for Rush Meadows Dam (SCE 2020), if woody debris builds up along the dam, SCE will temporarily raise the reservoir elevation to direct flow through the spillway notch to "flush" floating debris downstream of the dam.[9] The flushing operation will typically be implemented every 3 years and more frequently, if needed, to effectively manage floating debris.

- **Gem Dam**: Woody debris is removed with an overhead hoist/crane and placed downstream of the dam to dry out. Once dry, it is burned onsite.

- **Agnew Dam**: Woody debris is removed with a small overhead crane and placed downstream of the dam to dry out. Once dry, it is burned onsite.

### 4.5.8 Pest Management

Management of rodent populations at Project facilities includes a combination of physical control and rodenticide use. The purpose of rodent control is to prevent rodent infestations in building interiors, thereby protecting worker/public health and safety and maintaining system reliability. Rodent traps and over-the-counter rodenticides are used in the interior of buildings located at the powerhouse complex and at ancillary facilities located at Gem and Agnew dams.

### 4.5.9 Trail Maintenance

Project access trails are regularly inspected during normal Project activities. Repairs are conducted on an as-needed basis and generally include debris and rock removal; vegetation management; minor brushing; installation of access control structures such as barrier rock; and repair/replacement of signage.

### 4.5.10 Power and Communication Line Maintenance

Power and communication line maintenance includes replacement of damaged poles on an as-needed basis. New poles are placed in, or immediately adjacent to, previously

[8] Rush Meadows Dam is within the Ansel Adams Wilderness Area and burning is not allowed.

[9] For safety reasons, reservoir levels would not exceed 5 feet above the spillway crest elevation (9,400.6 feet).

existing holes using helicopters. Vegetation management is also conducted along power and communication line corridors, as needed.

## 4.6 PROJECT GENERATION AND OUTFLOW RECORDS

Seismic restrictions (first implemented in 2012) affect the total amount of water available for power generation at Rush Creek Powerhouse. Agnew Lake no longer stores water for power generation, and the timing of flow released from Gem Lake has shifted because storage in Waugh Lake is limited. Figure 4-10 shows the WY 1990–2011 and WY 2012–2023 monthly average power generation at the Rush Creek Powerhouse. Generation in September through February is substantially reduced in the later period compared to the earlier period. Therefore, the description of annual/monthly energy production and dependable capacity is divided into two periods: (1) Historical Operations (WY 1990–2011); and (2) Current Operations (WY 2012–2023).

Because of reduced storage in the Project, total annual power generation depends largely on WY type (total available water in the system in a given year). Figure 4-11 shows the total annual Rush Creek Powerhouse generation for 1990 through 2023 (also see Section 8.2, Water Use and Hydrology).

### 4.6.1 Historic Dependable Capacity and Annual/Monthly Energy Production

The historical Rush Creek Powerhouse dependable capacity is 11.7 MW. The powerhouse has an installed capacity of 13.01 MW, and during a period of high energy demand (July/August of a low WY), the powerhouse could operate at a plant capacity factor of approximately 0.9 (90 percent) for a period of days or weeks. Average annual energy production for WY 1990–2011 was 46,017,944 kilowatt-hours (kWh). The minimum and maximum annual power production for the same period were 10,434,200-kWh and 71,051,882-kWh, respectively. The monthly average, minimum, and maximum energy production for this period and the plant capacity factor are shown in Table 4-7. Flow statistics for the Rush Creek Powerhouse are provided in Table 4-6.

### 4.6.2 Current Dependable Capacity and Annual/Monthly Energy Production

The current Rush Creek Powerhouse dependable capacity is 11.7 MW. During a period of high energy demand (July/August of a low WY), the powerhouse (13.01 MW) remains able to operate at a plant capacity factor of approximately 0.9 (90 percent) for a period of days or weeks. Average annual energy production for the WY 2012–2023 was 33,542,371 kWh. The minimum and maximum annual power production for the same period were 14,474,962-kWh and 60,790,380-kWh, respectively. The monthly average, minimum, and maximum energy production and the plant capacity factor for this period are shown in Table 4-7. Flow statistics for the Rush Creek Powerhouse are provided in Table 4-6.

### 4.6.3 Summary of Project Generation and Outflow (WY 2019–2023)

Monthly energy production and outflow data for the last 5 years (WY 2019–2023) are summarized in Table 4-8 and Table 4-9. During this period, monthly generation ranged from 0-kWh to 8,654,448-kWh, and monthly average flow through the powerhouse ranged from 0 cfs to 106 cfs.

### 4.6.4 Regulatory Requirements

#### 4.6.4.1 Existing FERC License Articles

FERC issued a new license to SCE on February 4, 1997, for the Project (FERC 1997). The licensed Project is subject to Articles 1 through 32 of FERC's standard terms and conditions set forth in Form L-1 (October 1975) titled *Terms and Conditions of License for Constructed Major Project Affecting Lands of the United States*.

Project-specific License Articles mandated by FERC and conditions submitted by the Forest Service under Section 4(e) of the Federal Power Act are included in the License Order. The license has subsequently been amended by FERC at various times over the term of the license. FERC has also issued various administrative orders approving management and monitoring plans and design drawings that were required as part of the current license, effectively completing that requirement of the License Article or 4(e) Condition. Table 4-10 summarizes the requirements of each License Article and Forest Service 4(e) Condition, identifies current compliance status, and describes FERC actions related to each License Article or 4(e) Condition.

SCE is responsible for complying with all requirements of the FERC license, including all subsequent orders and amendments issued to date (Table 4-10); findings of FERC inspections; findings of other inspections under 18 CFR Part 12; and other FERC directives, information requests, or inquiries. SCE has not been cited for a license violation during the current license term and has never received a notice of violation from FERC related to the Project.

A Water Quality Certification was not issued for the Project. By letter dated November 4, 1981, SCE filed a request for water quality certification with the Regional Water Quality Control Board. On December 13, 1992, the Regional Water Quality Control Board waived the water quality certification for the Project.

## 4.7 EXISTING ENVIRONMENTAL MEASURES

Existing environmental measures for the Project are specified in license articles and Forest Service 4(e) conditions contained in the current license. These measures are summarized below.

### 4.7.1 Water Resources

#### 4.7.1.1 Minimum Streamflow Requirements

Forest Service 4(e) Condition No. 5 requires minimum instream flows be maintained as follows (also refer to Table 4-5):

- Between Waugh and Gem lakes, a continuous, minimum flow of 10 cfs or the natural flow into Waugh Lake, whichever is less.
- Between Gem and Agnew lakes, and immediately below Agnew Dam, a continuous minimum flow of 1 cfs or natural flows when the level of either Gem or Agnew lakes falls below the face of each respective dam.

License Article 401 allows that flows required in Condition No. 5 may be temporarily modified if required by operating emergencies beyond the control of the licensee, or for short periods upon agreement among the licensee, the California Department of Fish and Wildlife (CDFW), and the Forest Service.

#### 4.7.1.2 Reservoir Levels and Ramping Rates

Forest Service 4(e) Condition No. 8 requires specific reservoir elevations based on season and water year type. As a result of reservoir elevation restrictions imposed by FERC, the reservoir elevations specified in Condition No. 8 have been superseded. Historical and current FERC elevation requirements for Project reservoirs are provided in Table 4-4.

In addition, Condition No. 8 requires adherence to CDFW standards for ramping of flows during annual drawdown of Project reservoirs. This includes a standard which provides for no more than a 25 percent change in flow over any given 8-hour period.

License Article 401 allows that lake levels and ramping rates required in Condition No. 8 may be temporarily modified if required by operating emergencies beyond the control of the licensee, or for short periods upon agreement among the licensee, the CDFW, and the Forest Service.

#### 4.7.1.3 Guaranteed Flow Device

Forest Service 4(e) Condition No. 6 requires operation and maintenance of minimum instream flow and reservoir level monitoring devices and submittal of an annual stream flow and reservoir levels report to the Forest Service by December 31.

### 4.7.2 Cultural Resources

#### 4.7.2.1 Cultural Resources Management Plan

SCE prepared a Cultural Resources Management Plan (CRMP) for the 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). In accordance with License Article 403 and Forest Service 4(e) Condition No. 14, SCE implements the CRMP, which identifies specific measures that SCE undertakes to avoid adverse effects to National Register of Historic Places 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 National Register of Historic Places eligible properties cannot be avoided with implementation of protective and avoidance measures, SCE, in consultation with the State Historic Preservation Officer (SHPO) and FERC, shall address any effects in accordance with 36 CFR Part 800.

#### 4.7.2.2 Cultural Resources Surveys, Reporting, and Consultation

In accordance with License Article 404, if archaeological or historic sites are discovered during Project operation, SCE is required to consult with the Forest Service and SHPO; prepare a cultural resources management plan and schedule to evaluate the site significance and avoid or mitigate impacts to eligible resources; base the plan on Forest Service, SHPO, and Interior Secretary guidelines; file the plan for FERC approval, together with the written comments of the Forest Service and SHPO; and take steps to protect discovered sites from further impacts until notified by FERC.

### 4.7.3 Aquatic Resources

#### 4.7.3.1 Fish Stocking

In accordance with FERC's Order Approving and Modifying Fish Mitigation Proposal under Article 405 (March 2002), SCE is required to stock trout at Silver Lake, downstream of the Project, every 5 years to offset potential fish entrainment. Offsite mitigation is used because of the potential presence of mountain yellow-legged frog in Gem and Agnew lakes. Prior to each stocking event, SCE consults with the CDFW to determine the type of fish and the appropriate location for stocking.

#### 4.7.3.2 Riparian Monitoring and Reporting

In accordance with Forest Service 4(e) Condition No. 7, SCE implements a riparian and aquatic resource monitoring program on Rush Creek. The program consists of a baseline (Phase 1) and long-term (Phase 2) components. SCE is currently implementing Phase 2 with monitoring and reporting occurring every 8 years.

#### 4.7.3.3 Ground-Disturbing Activities Consultation

Prior to starting any activities that the Forest Service determines to be of a land-disturbing nature on National Forest System (NFS) lands, SCE is required to file the following:

- **Hazardous Substances Plan** – At least 60 days before starting any activities the Forest Service determines to be of a land-disturbing nature on NFS land, SCE is required to file a plan for oil and hazardous substances storage and spill prevention and cleanup (Forest Service 4[e] Condition No. 9).

- **Erosion Control Plan** – At least 60 days before starting any activities the Forest Service determines to be of a land-disturbing nature on NFS land, SCE is required to file a plan for the control of erosion, stream sedimentation, dust, and soil mass movement (License Article 402 and Forest Service 4[e] Condition No. 10).

- **Spoil Disposal Plan** – Before starting any activities the Forest Service determines to be of a land-disturbing nature on NFS land, SCE is required to file a plan for the storage and/or disposal of excess construction/tunnel spoils and slide material (Forest Service 4[e] Condition No. 11).

- **Visual Resource Protection Plan** – Before starting any activities the Forest Service determines to be of a land-disturbing nature on NFS land, SCE is required to file a plan for the design and construction of project facilities in order to preserve or enhance its visual character (Forest Service 4[e] Condition No. 12).

- **Threatened, Endangered, and Sensitive Species Management Plan** – Before starting any activities the Forest Service determines to be land-disturbing nature on NFS land, SCE is required to file a detailed implementation plan for the mitigation of impacts to sensitive, threatened, and endangered plant and animal species located within the area to be disturbed (Forest Service 4[e] Condition No. 13).

## 4.8 PROJECT SAFETY

This section summarizes existing Project safety measures implemented by SCE in accordance with 18 CFR Part 12. It includes a discussion of SCE's Corporate Dam Safety Program, dam inspections and reporting, Emergency Action Plan (EAP), and Public Safety Plan implemented for the Project.

### 4.8.1 Owner's Dam Safety Program

SCE maintains a Corporate Dam and Public Safety Program to ensure continued safe operations of its dams and hydroelectric facilities in a manner that complies with regulatory requirements and SCE's corporate safety policies. The Owner's Dam Safety Program (ODSP) protects life, property, lifelines, and the environment by ensuring the safety of dams. Rush Meadows, Gem, and Agnew dams are subject to SCE's ODSP. The most recent ODSP includes the objectives to establish the following:

- Clear roles and responsibilities of key dam safety personnel

- Procedures for the identification of dam safety issues and corrective actions

- A dam safety training program

- Effective dam safety succession planning and knowledge transfer initiatives

- Compliance with regulatory requirements for safe operation of the dams and related hydroelectric facilities

- A plan for audits and assessments of the Dam Safety Program

SCE conducts an annual internal review of the ODSP (filed with FERC on December 14, 2023) and an external 5-year audit (filed with FERC on January 29, 2024).

### 4.8.2 Dam Inspections and Reporting

Dam inspections and reporting are conducted for the Project as described below. The Project dams are unattended facilities. The reservoir level and flows in Rush Creek downstream of the dams are remotely monitored by the Supervisory Control and Data Acquisition system from SCE's Bishop Control Center, which is staffed continuously. When the ground is not snow covered, hydrographers visit the dams at least monthly to perform visual inspections and read the instrumentation.

#### 4.8.2.1 FERC Inspections

FERC conducts two types of inspections of the Project to verify license compliance: (1) dam safety inspections and (2) environmental inspections. Because Project dams are considered to have high hazard potential, dam safety inspections are conducted annually by FERC's Division of Dam Safety and Inspection to verify that (1) the Project is being properly maintained to ensure the continued safety of the structures, (2) no unauthorized modifications have been made to the Project, and (3) the Project is being operated efficiently and safely and in compliance with the terms and conditions of the license. FERC's most recent Dam Safety Inspection Report was filed on October 31, 2023.

FERC also conducts periodic environmental inspections to provide a thorough review of environmental requirements of the license, including those related to cultural resources, biological resources, public safety, recreation resources, and other environmental resources. FERC's most recent environmental inspection was conducted on August 21, 2018 and the report was filed on January 17, 2019.

#### 4.8.2.2 Part 12 D Independent Consultant Safety Inspections

An independent consultant under contract with SCE inspects Rush Meadows and Gem dams every 5 years in compliance with CFR Title 18, Part 12, Subpart D.[10] The Part 12D safety inspections are intended to identify any actual or potential deficiencies of Project facilities or adequacy of Project maintenance, surveillance, or methods of operation that might endanger public safety. The most recent Part 12D Periodic Inspection Report for Gem Dam was filed on October 30, 2023. The most recent report for Rush Meadows Dam was filed on December 17, 2018. On October 30, 2023, SCE requested an extension of time to file the next Part 12D Periodic Inspection Report for Rush Meadows Dam. FERC approved the request, and the next report is due by November 1, 2024.

#### 4.8.2.3 Dam Safety Surveillance and Monitoring Program

SCE files Dam Safety Surveillance and Monitoring Plans (DSSMP) and Dam Safety Surveillance and Monitoring Reports (DSSMR) for Rush Meadows and Gem dams. The

---

[10] Independent Consultant Safety Inspections for Agnew Dam are suspended during the period that the reservoir level is restricted (FERC 2016b).

DSSMP provides the details about how SCE monitors and evaluates the performance of each dam, and the DSSMR analyzes, evaluates, and interprets the dam safety surveillance and monitoring data and provides findings on the overall performance of the dam. On March 12, 2024, SCE filed its 2024 (DSSMP) and 2023 (DSSMR) for Rush Meadows and Gem dams.

On June 7, 2016, FERC accepted SCE's request to temporarily suspend DSSMP/DSSMRs and Independent Consultant Safety Inspections for Agnew Dam during the period that the reservoir level is restricted, and the dam impounds no water (FERC 2016b). As a condition of the temporary suspension, FERC requested that SCE:

- Conduct an onsite inspection of the dam if a storm event exceeds the low-level outlet capacity causing the dam to impound water;
- Provide an interim plan for operations, surveillance, and monitoring activities and for ensuring the low-level outlet remains free flowing until the reservoir is refilled; and
- Provide an annual status report detailing the interim surveillance and monitoring activities.

The most recent annual status report for Agnew Dam was filed with FERC on March 14, 2024.

### 4.8.3 Emergency Action Plans

Pursuant to 18 CFR § 12.20(a), SCE maintains an individual EAP for Agnew Dam, Gem Dam, and Rush Meadows Dam and operates the dams in accordance with each individual EAP. The purpose of the EAPs is to reduce the risk of loss of human life or injury and to minimize property damage in the event of a dam safety emergency or flooding caused by large releases from the Project dams. The EAPs define procedures to aid in identifying unusual circumstances that may endanger Project dams, and responsibilities and procedures for mitigative actions, conducted by SCE. In addition, the EAPs identify the responsibilities of local, county, state, and federal public safety agencies and the processes of notifications in the event of potential, impending, or actual failure of a Project dam. The EAPs may also be used to provide notification when release of naturally occurring high flows will create major flooding downstream of Project reservoirs.

SCE filed 5-year reprints of the Project EAPs and Inundation Maps with FERC on December 29, 2021. The next FERC EAP reprint is due December 31, 2026. Revised Project EAPs were filed with FERC on May 25, 2023 and July 19, 2023 to reflect changes in contact information provided in the notification flowcharts. On December 20, 2023, SCE filed the EAP Status Report and Annual Update for the Project with FERC.

#### 4.8.3.1 EAP Exercises

On April 5, 2023, SCE conducted a tabletop exercise of the EAPs for the Project. The 60-Day Evaluation Report was filed with FERC on May 15, 2023. On November 14, 2023, SCE conducted a functional exercise of the EAPs for the Project. The 60-Day Evaluation Report was filed with FERC on December 22, 2023.

#### 4.8.3.2 Time-Sensitive EAP

The Sudden Failure Assessments results for the Project were filed with FERC on July 27, 2021. SCE implemented several measures, including installing sirens, a public alerting system, pre-scripted messages; creating an incident management plan; and enhancing the EAP flowchart. SCE coordinates annually with the Forest Service to communicate, educate, and distribute flyers to recreationists prior to the recreation season. The public safety advisory flyers are distributed to campers and hikers and posted at Forest Service campgrounds in the potential inundation area.

### 4.8.4 Public Safety Plan

SCE maintains a Public Safety Plan for the Project that identifies the location of public safety measures and signage at Project facilities. Project features aimed at protecting public health and safety include:

- **Signage**: SCE uses signs to warn the public of hazardous areas and potentially dangerous conditions. For example, danger and warning signs are located near facilities that may pose a danger to the public (e.g., powerhouses, switchyards, and water release points).

- **Physical Restraining Devices**: SCE uses various devices to restrict public access to hazardous areas, including:

    - Fences and locked gates limiting access to the powerhouse complex; around the tailrace, substation, and transformer yards; and along Project dams.

    - Grates/trash racks on dam intakes structures.

    - Boat barriers along dam spillways.

SCE annually reviews and updates the Public Safety Plan, as necessary.

## 4.9 REFERENCES


DSOD (California Department of Water Resources, Division of Safety of Dams). 2020. Rush Creek Meadows Dam, No. 104-34, Mono County. Letter to Southern California Edison. February 7, 2020.

FERC (Federal Energy Regulatory Commission). 1992. Environmental Assessment for Hydropower License: Rush Creek, FERC Project No. 1389-001, California at 28.

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

———. 2012. Reservoir Drawdown for Rush Meadows Dam and Gem Lake Dam. FERC Accession No. 20120703-0309. June 28.

———. 2013. Interim Reservoir Operation Plan for Agnew Lake Dam. FERC Accession No. 20130502-0335. April 24.

———. 2016a. Plan and Schedule for the Seismic Retrofit of the Rush Creek Project. FERC Accession No. 20161108-0178. October 27.

———. 2016b. Plan and Schedule for BOC Activities for the Rush Creek Project, and Suspension of Inspections for Agnew Lake Dam. June 7.

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.

———. 2009. Exhibit G – Project Maps. Sheets G-1 through G-4. Rush Creek Project, FERC Project No. 1389. April.

———. 2012. Request for Temporary Variance of License Article 401 for Curtailment of Gem and Waugh Lakes Water Elevation Requirement, SCE Rush Creek Hydroelectric Project (FERC No. 1389). FERC Accession No. 20120608-5011. June 7.

———. 2013a. Exhibit A – As Built General Description and Specifications of Mechanical, Electrical, and Transmission Equipment. Rush Creek Powerhouse, FERC Project No. 1389. July.

———. 2013b. Exhibit F – General Design Drawings. Sheets F-1 through F-5. Rush Creek Project, FERC Project No. 1389. July.

———. 2013c. Historic American Engineering Record (HAER). Rush Creek Hydroelectric System, Rush Meadow Dam. HAER No. CA-166-H.

———. 2013d. Historic American Engineering Record. Rush Creek Hydroelectric System, Gem Lake Dam. HAER No. CA-166-G.

———. 2013e. Historic American Engineering Record. Rush Creek Hydroelectric System, Agnew Lake Dam. HAER No. CA-166-F.

———. 2017. Final Closeout Report for the Rush Creek Hydroelectric System Emergency Protective Measures (SPL-017-00326-GLH) Rush Creek Hydroelectric Project, FERC Project No. 1389. November 21.

———. 2018. Final Report for Southern California Edison's Rush Meadows Dam Modification Project (File No. SPL-2018-00104-GLH/Order No. R6V-2018-0026), Rush Creek Hydroelectric Project – FERC Project No. 1389. October 22.

———. 2020. Proposed Debris Management Plan, Rush Meadows Dam, FERC Project No. 1389. Revised March 17, 2020.

# TABLES

## Table 4-1. Rush Creek Project Facilities

| Rush Meadows Dam Area |
|---|
| **Dams** |
| Rush Meadows Dam |
| **Reservoirs** |
| Waugh Lake |
| **Valve House** |
| Rush Meadows Dam Valve House |
| **Stream Gages** |
| Rush Creek below Rush Meadows (Waugh Lake) (USGS No. 10287262; SCE No. 359r) |
| **Reservoir Gages** |
| Waugh Lake (USGS No. 10287260; SCE No. 359) |
| **Trails** |
| Rush Meadows Dam Access Trail |
| **Rush Meadows Dam/Waugh Lake Ancillary and Support Facilities** |
| Rush Meadows Dam Equipment Shed |
| Rush Meadows Dam Gage House |
| Rush Meadows Dam Solar Facility |
| **Gem Dam Area** |
| **Dams** |
| Gem Dam |
| **Reservoirs** |
| Gem Lake |
| **Flowline** |
| Gem Dam to Agnew Junction Flowline |
| **Valve House** |
| Gem Valve House and Cabin |
| Gem Dam Arch 8 Valve House |
| Gem Flowline Valve House |
| **Stream Gages** |
| Rush Creek below Gem Lake (USGS No. 10287281; SCE No. 352r) |
| **Reservoir Gages** |
| Gem Lake (USGS No. 10287280; SCE No. 352) |

| Gem Dam Area (continued) |
|---|
| **Communication Lines** |
| Communication Line from Rush Creek Powerhouse to Gem Lake Dam |
| Communication Line from Gem Valve House to Arch 8 Valve House |
| Communication Line from Gem Tram Hoist House to Gem Valve House |
| **Trams and Hoist Houses** |
| Gem Tram |
| Gem Tram Hoist House |
| Gem Tram Lower/Upper Landing |
| **Trails** |
| Lower Gem Dam Access Trail |
| Gem Dam Arch 8 Access Trail |
| Upper Gem Dam Access Trail |
| **Gem Dam/Lake Ancillary and Support Facilities** |
| Gem Lake Dock |
| Gem Lake Motor Barge |
| Gem Bunkhouse |
| Gem Outhouse |
| Gem Cookhouse |
| Gem Dam Compressor Shed |
| Gem Dam Storage Shed |
| Gem Dam Overhead Hoist House for Dam Length |
| Gem Dam Overhead Hoist House |
| Gem Fish Release Footbridge |
| Gem Tram Landing Footbridge |
| Gem Tram Bridge |
| Gem Weather Station |
| Gem Satellite Dish |
| Gem Solar Facility |
| Gem Valve House Tunnel |

| Agnew Dam Area |
|---|
| **Dams** |
| Agnew Dam |
| **Reservoirs** |
| Agnew Lake |
| **Flowline** |
| Agnew Dam to Agnew Junction Flowline |
| **Valve House** |
| Agnew Junction (Valve House and Standpipe) |
| Agnew Dam Valve House |
| **Stream Gages** |
| Rush Creek below Agnew Lake (USGS No. 10287289; SCE No. 357) |
| **Reservoir Gages** |
| Agnew Lake (USGS No. 10287285; SCE No. 351) |
| **Power Lines** |
| 4-kV Agnew Distribution Line |
| 4-kV Agnew Dam Tap Line |
| 4-kV Upper Agnew Boat Dock Tap Line |
| **Communication Lines** |
| Communication Line from Agnew Hoist House to Agnew Boathouse |
| **Trams and Hoist Houses** |
| Agnew Tram |
| Agnew Tram Hoist House |
| Agnew Tram Landing |
| **Trails** |
| Agnew Stream Gage Access Trail |
| **Agnew Dam/Lake Ancillary and Support Facilities** |
| Lower Agnew Lake Boathouse / Dock |
| Upper Agnew Lake Boathouse / Dock |
| Agnew Lake Motor Barge |
| Agnew Cabin |
| Agnew Weather Station |
| Agnew Flume (downstream of Agnew Dam) |

| Rush Creek Powerhouse Area |
|---|
| **Penstocks** |
| Agnew Junction to Rush Creek Powerhouse Penstock (No. 1) |
| Agnew Junction to Rush Creek Powerhouse Penstock (No. 2) |
| **Powerhouse** |
| Rush Creek Powerhouse |
| **Gages** |
| Rush Creek Powerhouse (USGS No. 10287300; SCE No. 367) |
| **Power Lines** |
| 2.4-kV Switchyard to Powerhouse Distribution Line |
| **Powerhouse Ancillary and Support Facilities** |
| Rush Creek Powerhouse Complex Access Road |
| Cottages (2) |
| Garages (4) |
| Warehouse and Dock |
| Machine Shop |
| Pump House |
| Woodsheds (2) |
| Helicopter Landing Site |
| Tank (propane) |
| Bridge over Powerhouse Tailrace |
| Bridge over Rush Creek |

## Table 4-2. Rush Creek Project Facility Specifications

| Facility | Original Design | Modifications to Original Design |
|---|---|---|
| **Rush Meadows Dam and Waugh Lake** | | |
| **Dam** | | |
| Type | constant radial arch | — |
| Material | concrete | — |
| Height (maximum) | 50 feet | — |
| Length | 463 feet | — |
| Volume | 3,078 cu yd | — |
| Elevation of Dam Crest | 9,418.6 feet | — |
| Elevation of Outlet Pipes (bottom) | 9,368.6 feet | — |
| Geomembrane | Installed on entire upstream face of dam (2009) | Removed at location of spillway notch |
| Outlet Pipe Capacity (two steel-lined conduits, right is circular with a 24-inch diameter; and left is square with sides measuring 30 inches) | 200 cfs at WSE elevation of 9,415.6 feet | |
| **Spillway** | | |
| Type | uncontrolled, concrete overflow | — |
| Elevation | 9,415.6 feet | 9,395.6 feet<br>(@ spillway crest) |
| Dimensions | 55 feet wide x 3 feet deep | 43 feet wide x 3 feet deep<br>12 feet wide x 19 feet deep (notch) |
| Capacity | 900 cfs at elevation of 9,418.6 feet | 4,600 cfs<br>(900 cfs [existing] + 3,700 cfs [notch]) at elevation of 9,418.6 feet |
| **Reservoir** | | |
| Elevation at Maximum Operating Water Surface | 9,415.6 feet | 9,395.6 feet (@ modified WSE) |
| Elevation at Minimum Operating Water Surface | 9,376 feet | — |
| Gross Storage | 5,277 ac-ft | 1,555 ac-ft (@ modified WSE) |
| Dead Storage | 0 ac-ft | — |
| Active Storage | 5,277 ac-ft | 1,555 ac-ft (@ modified WSE) |

| Facility | Original Design | Modifications to Original Design |
|---|---|---|
| Area at Maximum Operating Water Surface | 185 ac | 130 ac (@ modified WSE) |
| Area at Minimum Operating Water Surface | 1 ac | — |
| **Gem Dam and Lake** | | |
| **Dam** | | |
| Type | multiple arch (16 complete; 2 partial) | — |
| Material | Concrete | — |
| Height (maximum) | 84 feet | — |
| Length | 688 feet | — |
| Volume | 21,612 cu yd | — |
| Elevation of Dam Crest | 9,057.5 feet | — |
| Elevation of Outlet Pipe (bottom) | 8,985 feet | — |
| Geomembrane | Installed on entire upstream face of dam (2007) | — |
| Outlet Capacity (36-inch pipe) | 220 cfs capacity at a normal max elevation of 9,051.6 feet | 260 cfs capacity at max elevation of 9,027.5 feet (restricted WSE)<br>280 cfs capacity at max elevation of 9,051.6 feet |
| **Spillway** | | |
| Type | Uncontrolled | — |
| Upper Spillway Elevation | 9,053.64 feet | — |
| Openings/Dimensions | 5 openings/5 feet wide x 2 feet high | — |
| Lower Spillway Elevation | 9,051.63 feet | — |
| Openings/Dimensions | 8 openings/5 feet wide x 2 feet high | — |
| Total Width | 65 feet | — |
| Capacity | 1,270 cfs at elevation of 9,057.5 feet | — |
| **Intake Structure** | | |
| Material | reinforced concrete | — |
| Encased Steel Pipe Diameter | 48 inches | — |
| Control | 48-inch butterfly valve | — |
| **Flowline (Gem Dam to Agnew Junction)** | | |
| Type | steel pipe | — |

| Facility | Original Design | Modifications to Original Design |
|---|---|---|
| Length | 4,584 feet | — |
| Diameter | 48 inches | — |
| Capacity | 110 cfs | 18-inch-diameter outlet with gate valve installed on existing blind flange which allows for up to 200 cfs to be released when Rush Creek Powerhouse is offline |
| **Reservoir** | | |
| Elevation at Maximum Operating Water Surface | 9,051.6 feet | 9,027.5 feet (@ restricted WSE) |
| Elevation at Minimum Operating Water Surface | 8,964.3 feet | — |
| Gross Storage | 17,228 ac-ft | 10,752 ac-ft (@ restricted WSE) |
| Dead Storage | 0 ac-ft | — |
| Active Storage | 17,228 ac-ft | 10,752 ac-ft (@ restricted WSE) |
| Area at Maximum Operating Water Surface | 282 ac | 256 ac (@ restricted WSE) |
| Area at Minimum Operating Water Surface | 20 ac | |
| **Gem Tram** | | |
| Agnew Lake to Gem Dam | 1,490 feet (0.28 mi) | — |
| **Agnew Dam and Lake** | | |
| **Dam** | | |
| Type | multiple arch (5 complete; 2 partial) | — |
| Material | concrete | — |
| Height (maximum) | 30 feet | — |
| Length | 278 feet | — |
| Volume | 713 cu yd | — |
| Elevation of Dam Crest | 8,498.9 feet | — |
| Elevation of Outlet Pipe (bottom) | 8,470.0 feet | — |
| Geomembrane | Installed on entire upstream face of dam in (2012) | Removed at location of notches in 2017 |
| Outlet Capacity (30-inch pipe) | 53 cfs at WSE elevation of 8,498.5 feet | — |

| Facility | Original Design | Modifications to Original Design |
|---|---|---|
| **2017 Modifications**: Two notches cut into base of dam (Arches No. 5 and No. 6) measuring 6 feet 2 inches high by 5 feet wide | NA | 1,164 cfs total notch capacity at WSE elevation of 8,498.5 feet |
| **Spillway** | | |
| Type | Uncontrolled | — |
| Elevation | 8,495.88 feet | — |
| Openings | 16 rectangular | — |
| Opening Dimensions | 5 feet wide x 2 feet high | — |
| Total Width | 80 feet | — |
| Capacity | 1,250 cfs at WSE elevation of 8,498.5 feet | — |
| **Intake Structure** | | |
| Material | reinforced concrete | — |
| Encased Steel Pipe Diameter | 30 inches | — |
| Control | 30-inch gate valve | — |
| **Flowline (Agnew Dam to Agnew Valve House)** | | |
| Type | steel pipe | — |
| Length | 575 feet | — |
| Diameter | 30 inches | — |
| Capacity | 55 cfs | 100 cfs<br>Note: capacity when water is discharged into creek through flowline cuts |
| **Reservoir** | | |
| Elevation at Maximum Operating Water Surface | 8,495.88 feet | After notching of the dam, the Project no longer stores water. A pre-project natural lake is present with a max elevation of 8,470 feet, gross storage of 569 ac-ft, and a surface area of 23 ac |
| Elevation at Minimum Operating Water Surface | 8,470.0 feet | |
| Gross Storage | 1,379 ac-ft | |
| Dead Storage | 569 ac-ft | |
| Active Storage | 810 ac-ft | |
| Area at Maximum Operating Water Surface | 40 ac | |
| Area at Minimum Operating Water Surface | 23 ac | |
| **Agnew Tram** | | |
| Powerhouse to Agnew Dam | 4,280 feet (0.81 mi) | — |

| Facility | Original Design | Modifications to Original Design |
|---|---|---|
| **Rush Creek Powerhouse** | | |
| Total Installed Capacity | 13.01 MW[1] | — |
| **Powerhouse (Unit 1)** | | |
| Installed Capacity | 5.85 MW | — |
| Generator | General Electric, horizontal shaft | — |
| Turbine | single-overhung, single-jet, impulse<br>28-inch hydraulic, slide-gate, turbine shutoff valve | — |
| Horsepower | 8,515 | — |
| Design Head | 1,750 feet | — |
| R.P.M. | 300 | — |
| Minimum Estimated Hydraulic Capacity | 3 cfs | — |
| Maximum Estimated Hydraulic Capacity | 55 cfs | — |
| **Powerhouse (Unit 2)** | | |
| Installed Capacity | 7.16 MW | — |
| Generator | Allis Chalmers, horizontal shaft | — |
| Turbine | single-overhung, single-jet, impulse<br>28-inch hydraulic, slide-gate, turbine shutoff valve | — |
| Horsepower | 8,000 | — |
| Design Head | 1,650 feet | — |
| R.P.M. | 300 | — |
| Minimum Estimated Hydraulic Capacity | 3 cfs | — |
| Maximum Estimated Hydraulic Capacity | 55 cfs | — |
| **Penstocks** | | |
| Type | steel pipe (2) | — |
| Length (Agnew Valve House to Powerhouse) | 4,280 feet (0.81 mi) | — |
| Diameter | 28–30 inches | — |
| Capacity | 110 cfs (55 cfs each penstock) | — |

| Facility | Original Design | Modifications to Original Design |
|---|---|---|
| **Tail Race** | | |
| Maximum Tail Water Surface | 7,225.0 feet | — |
| Minimum Tail Water Surface | 7,221.5 feet | — |

1 The Federal Energy Regulatory Commission authorized capacity is 11.85 megawatts.

Key:

— = no change

ac = acre

ac-ft = acre-feet

cfs = cubic feet per second

cu yd = cubic yard

mi = mile

MW = megawatt

WSE = water surface elevation

**Table 4-3. Summary of Recent Maintenance Activities and Emergency / Interim Modifications (1997–2023)**

| Date | Recent Maintenance Activities and Emergency / Interim Modifications | Work Authorized / Conducted in the Wilderness in Consultation with the Forest Service |
|---|---|---|
| 1998 | Grouting program at Rush Meadows Dam | X |
| 2004 | Reconstruction of trash rack and installation of ten post-tensioned anchors in the spillway crest at Rush Meadows Dam | X |
| 2007 | Geomembrane liner installed on entire upstream face of Gem Dam | X |
| 2009 | Geomembrane liner installed on entire upstream face of Rush Meadows Dam, pressure grouting performed in voids around trash rack, and installation of ten anchors in the arch crest | X |
| 2010 | Rush Meadows Concrete Study, acoustic tomography / spectral analysis of surface waves | X |
| 2011 | Rush Meadows Concrete Study, coring | X |
| 2012 | Geomembrane liner installed on entire upstream face of Agnew Dam | NA |
| 2017 | Installed 18-inch-diameter outlet with gate valve on an existing blind flange along Gem Flowline | NA |
| 2017 | Lower half of Agnew Flowline removed in two places along a 16-foot length of the suspended section | NA |
| 2017 | Cut 6-feet 2-inch wide by 5-feet-high notch into the base of Agnew Dam in Arch 5 and Arch 6 | NA |
| 2018 | Cut 12-foot-wide by roughly 19-foot-high notch in the left section of Rush Meadows Dam | X |
| 2019 | Gem Dam solar battery system installation | NA |
| 2020 | 4-kilovolt powerline from Agnew Dam to Gem Dam physically removed | NA |
| 2020–2021 | Gem Dam Arch 8 outlet valve retrofitted | NA |

Notes: NA = not applicable, these facilities/activities are outside the wilderness area

## Table 4-4. FERC Elevation Requirements for Waugh, Gem, and Agnew Lakes, Including Current Seismic Restrictions

| Reservoir | Current License Elevation Requirement (but Superseded by Current Seismic Restrictions) | Seismic Restrictions (Maximum Elevation, Feet)[1] |
|---|---|---|
| **Waugh Lake** | | |
| Regular Water Years | Within 2 feet of spillway elevation (9,416 feet) July 1 to the Tuesday following Labor Day weekend[2] | 9,392.1 feet (≈1,555 ac-ft) |
| Low Water Years (<75 percent of the April 1 snow water equivalent for the Mono Basin) | Within 3 feet of spillway elevation (9,416 feet) July 1 to the Tuesday following Labor Day weekend[3] | |
| **Gem Lake** | | |
| Regular Water Years | Within 2 feet of spillway elevation (9,052 feet) July 1 to the Tuesday following Labor Day weekend[2] | 9,027.5 feet (≈10,752 ac-ft) |
| Low Water Years (<75 percent of the April 1 snow water equivalent for the Mono Basin) | Within 6 feet of spillway elevation (9,052 feet) July 1 to the Tuesday following Labor Day weekend[3] | |
| **Agnew Lake** | | |
| All Water Years | Within 15 feet of spillway elevation (8,496 feet) July 1 to the Tuesday following Labor Day weekend | Completely Drained (8,470.0 feet) (≈569 ac-ft) |

Notes:

1 FERC 2012, 2013

2 Licensee may maintain reduced lake levels when necessary to avoid the spill of water from Gem Lake at potentially damaging volumes. In such event, licensee shall cause the water level in Waugh and Gem Lakes to reach 2 feet below the spillway elevations as soon as practicable after July 1.

3 To the extent sufficient water is available to meet (i) minimum stream flow requirements required in Forest Service 4(e) Condition No. 5, and (ii) a target 14 cfs release from the project powerhouse, based on plant operational minimums.

Key:

ac-ft = acre-feet

cfs = cubic feet per second

FERC = Federal Energy Regulatory Commission

## Table 4-5. FERC Instream Flow Requirements for the Rush Creek Project

| Location | Instream Flow Requirement (cfs) | Measurement Gage |
|---|---|---|
| Below Rush Meadows (Waugh Lake) Dam | 10 cfs or natural flow into Waugh Lake, whichever is less | SCE 359 R and USGS 10287262 |
| Below Gem Dam | 1 cfs or natural flow if the reservoir falls below the face of the dam | SCE 352 R and USGS 10287281 |
| Below Agnew Dam | 1 cfs or natural flow if the reservoir falls below the face of the dam | SCE 357 and USGS 10287289 |

Key:
cfs = cubic foot/feet per second
FERC = Federal Energy Regulatory Commission
SCE = Southern California Edison Company
USGS = United States Geological Survey

## Table 4-6. Monthly Mean and Maximum Flows (cfs) through Rush Creek Powerhouse (USGS Gage No. 10287300/SCE No. 367)

| Month | Rush Creek Powerhouse Flows (cfs) | | | |
|---|---|---|---|---|
| | Historic Operations WY 1990–2011 | | Operations with Seismic Restrictions WY 2012–2023 | |
| | Mean | Maximum | Mean | Maximum |
| October | 53 | 104 | 26 | 79 |
| November | 42 | 102 | 23 | 100 |
| December | 35 | 79 | 22 | 102 |
| January | 37 | 96 | 16 | 81 |
| February | 40 | 102 | 26 | 105 |
| March | 45 | 102 | 34 | 104 |
| April | 36 | 101 | 29 | 107 |
| May | 54 | 106 | 47 | 108 |
| June | 61 | 104 | 67 | 113 |
| July | 63 | 106 | 57 | 106 |
| August | 42 | 106 | 39 | 105 |
| September | 49 | 103 | 24 | 102 |

Key:
cfs = cubic feet per second
WY = water year

## Table 4-7. Rush Creek Powerhouse Generation (Top) and Plant Capacity Factor (Bottom) (WY 1990–2023)

| Month | Rush Creek Powerhouse Generation (kWh) | | | | | |
|---|---|---|---|---|---|---|
| | Historic Operations WY 1990–2011 | | | Operations with Seismic Restrictions WY 2012–2023 | | |
| | Mean | Min | Max | Mean | Min | Max |
| October | 4,494,130 | 969,547 | 7,654,050 | 1,905,718 | 772,331 | 3,376,112 |
| November | 3,663,040 | 122,924 | 7,196,795 | 1,790,918 | 75,578 | 3,934,666 |
| December | 3,076,067 | 128,218 | 4,991,249 | 2,259,798 | 206,210 | 6,796,699 |
| January | 3,087,040 | 133,427 | 6,805,618 | 1,292,620 | 187,657 | 3,167,630 |
| February | 3,104,200 | 137,851 | 6,113,120 | 2,084,592 | 450,260 | 3,410,208 |
| March | 3,753,039 | 225,823 | 8,614,465 | 3,093,253 | 126,512 | 7,029,468 |
| April | 3,018,073 | 236,986 | 5,864,266 | 2,604,841 | 144,449 | 5,095,896 |
| May | 4,738,031 | 1,122,634 | 8,383,145 | 4,274,691 | 348,387 | 8,352,823 |
| June | 5,176,340 | 1,743,033 | 8,322,081 | 5,862,271 | 2,091,166 | 8,323,536 |
| July | 5,399,916 | 815,431 | 8,742,880 | 4,812,932 | 619,018 | 8,828,948 |
| August | 3,477,228 | 420,845 | 8,635,173 | 3,266,614 | 352,487 | 8,654,448 |
| September | 3,980,738 | 714,917 | 8,408,057 | 1,910,807 | 44,050 | 4,284,572 |

| Month | Rush Creek Powerhouse Capacity Factor (%) | | | | | |
|---|---|---|---|---|---|---|
| | Historic Operations WY 1990–2011 | | | Operations with Seismic Restrictions WY 2012–2023 | | |
| | Mean | Min | Max | Mean | Min | Max |
| October | 44% | 0% | 79% | 20% | 8% | 35% |
| November | 38% | 0% | 77% | 20% | 1% | 43% |
| December | 32% | 1% | 52% | 23% | 2% | 70% |
| January | 32% | 1% | 70% | 14% | 0% | 34% |
| February | 34% | 2% | 68% | 22% | 0% | 35% |
| March | 39% | 2% | 89% | 33% | 0% | 75% |
| April | 31% | 3% | 63% | 27% | 0% | 53% |
| May | 47% | 0% | 87% | 44% | 0% | 86% |
| June | 53% | 0% | 89% | 63% | 0% | 89% |
| July | 56% | 8% | 90% | 50% | 6% | 91% |
| August | 36% | 4% | 89% | 35% | 4% | 92% |
| September | 6% | 1% | 12% | 20% | 0% | 44% |

Key: kWh = kilowatt-hour WY = water year

## Table 4-8. Last 5-Year Monthly Rush Creek Power Generation (WY 2019–2023)

| Month | Monthly Rush Creek Power Generation (kWh) | | | | |
|---|---|---|---|---|---|
| | WY 2019 | WY 2020 | WY 2021 | WY 2022 | WY 2023 |
| October | 772,331 | 873,082 | 2,332,600 | 1,672,701 | 955,961 |
| November | 689,742 | 1,264,985 | 713,996 | 1,787,128 | 75,578 |
| December | 749,335 | 327,349 | 732,788 | 1,770,632 | 3,174,736 |
| January | 752,020 | 0 | 756,018 | 2,719,779 | 605,488 |
| February | 2,991,848 | 2,579,940 | 2,352,936 | 2,240,018 | 2,030,130 |
| March | 7,002,799 | 4,493,712 | 3,616,200 | 243,515 | 126,512 |
| April | 2,953,543 | 5,095,896 | 1,584,017 | 144,449 | 1,233,076 |
| May | 8,352,823 | 5,683,152 | 2,446,910 | 3,653,558 | 7,785,321 |
| June | 8,068,074 | 4,613,270 | 2,651,686 | 6,355,733 | 8,109,949 |
| July | 8,576,278 | 5,862,133 | 619,018 | 2,909,421 | 8,352,172 |
| August | 4,859,160 | 1,253,766 | 833,023 | 5,892,872 | 8,654,448 |
| September | 1,984,167 | 2,063,406 | 1,970,617 | 4,284,572 | 2,689,739 |

Key:
kWh = kilowatt-hour
WY = water year

## Table 4-9. Last 5-Year Monthly Average Rush Creek Powerhouse Flow (WY 2019–2023)

| Month | Monthly Average Rush Creek Power Generation Flow (cfs) | | | | |
|---|---|---|---|---|---|
| | WY 2019 | WY 2020 | WY 2021 | WY 2022 | WY 2023 |
| October | 11 | 12 | 30 | 23 | 15 |
| November | 10 | 20 | 11 | 24 | 2 |
| December | 10 | 4 | 10 | 23 | 32 |
| January | 10 | 0 | 10 | 34 | 11 |
| February | 39 | 31 | 31 | 32 | 30 |
| March | 82 | 52 | 44 | 6 | 5 |
| April | 36 | 60 | 21 | 5 | 17 |
| May | 98 | 66 | 30 | 46 | 94 |
| June | 99 | 55 | 34 | 77 | 106 |
| July | 99 | 69 | 12 | 36 | 105 |
| August | 56 | 17 | 13 | 68 | 100 |
| September | 24 | 25 | 27 | 53 | 35 |

Key:
cfs = cubic foot/feet per second
WY = water year

**Table 4-10. Current License Requirements**

| License Article / Forest Service 4(e) Condition | Summary of License Article Requirements | Compliance Status | FERC Orders / Letters / Amendments |
|---|---|---|---|
| 201 | **Annual Payment**: Requires licensee to annually reimburse the FERC for administrative costs and recompensing for use, occupancy, and enjoyment of Federal lands. | Ongoing Compliance | **May 30, 2002: Order Amending License and Revising Annual Charges under Article 201**<br>The Order updated the authorized installed capacity of the project (as detailed on the revised Exhibit A filed with FERC on April 10, 2002), and amended the annual charges for administration of Part I of the Federal Power Act.<br>**May 1, 2009: Order Amending Annual Charges**<br>The Order updated the calculated acreage of federal land as a result of more accurate mapping capabilities/data being available. |
| 202 | **Amortization Reserve Account:** Requires licensee to annually determine reasonable rate of return to compute amortization reserves. | Ongoing Compliance | — |
| 203 | **Exhibit F and Exhibit G:** Within 45 days of license issuance, licensee is required to file a complete original set and two duplicate sets of all approved drawings in Exhibits F and G. | Complete: Exhibit F and Exhibit G filed with FERC on April 21, 1997, and revised May 12, 1997<br>Ongoing Compliance:<br>Over the term of the existing license, SCE has updated the Exhibit F and G sheets, as needed. Current Exhibit F and G sheets are on file with FERC. | — |
| 401 | **Minimum Instream Flows, Lake Levels, and Ramping Rates:** Licensee may request approval for temporary variance of minimum instream flows, lake levels, and/or ramping rates for operating emergencies beyond the control of the licensee, or for short periods upon agreement among the licensee, CDFW, and the Forest Service *(also refer to Forest Service 4[e] Condition No. 5 and No. 8)*. | Ongoing Compliance:<br>Requests for temporary variance made consistent with License Article 401. Refer to Condition No. 5 and No. 8 below for FERC actions. | — |
| 402 | **Erosion Control Plan**: Requires licensee to file an erosion control plan 60 days prior to the start of any land-disturbing or land-clearing activities (*also refer to Forest Service 4[e] Condition No. 10*). | Ongoing Compliance | — |
| 403 | **Cultural Resources Management Plan:** Within one year of license issuance, licensee is required to file a plan for implementation of the Cultural Resources Management Plan, and the data recovery plan to mitigate the adverse impacts of shoreline erosion on cultural sites (*also refer to Forest Service 4[e] Condition No. 14*). | Complete: Implementation plan filed October 8, 1997<br>Ongoing Compliance | — |
| 404 | **Cultural Resources Surveys, Reporting, and Consultation:** If archaeological or historic sites are discovered during project operation, the licensee is required to consult with the Forest Service and SHPO; prepare a cultural resources management plan and schedule to evaluate the site significance and avoid or mitigate impacts to eligible resources; base the plan on Forest Service, SHPO, and Interior Secretary guidelines; file plan for FERC approval, together with the written comments of the Forest Service and SHPO; and take steps to protect discovered sites from further impact until notified by FERC. | Ongoing Compliance | — |

| License Article / Forest Service 4(e) Condition | Summary of License Article Requirements | Compliance Status | FERC Orders / Letters / Amendments |
|---|---|---|---|
| 405 | **Fish Entrainment Plan:** Within six months of license issuance, licensee is required to file a plan to evaluate the entrainment of stocked trout at the Project's intake to determine if screens are needed.<br>If entrainment study indicates that significant entrainment of trout is occurring, the licensee shall file plans and a schedule for the installation of fish protection screens to reduce trout entrainment or an alternative mitigation proposal. | Complete: Entrainment Study Plan filed December 3, 1997<br>Complete: Entrainment Study Report filed July 13, 2001, and supplemented on February 25, 2002<br>Ongoing Compliance:<br>Reports filed September 2014 and August 2019<br>Next stocking event/report will occur in 2024 | **October 10, 1997: Order Granting Extension of Time to File Entrainment Plan per Article 405**<br>The Order approved licensee's request for an extension of time to comply with Article 405 which requires the licensee to file, by August 4, 1997, a plan to evaluate the entrainment of stocked trout at the project's intake. The deadline for filing the fish entrainment plan is extended to November 30, 1997.<br>**April 21, 1998: Order Approving Fish Entrainment Study Plan**<br>**June 19, 2000: Order Approving Extension of Time Request to File a Final Report on Fish Entrainment**<br>The Order approved licensee's request for an extension of time to file a final report on fish entrainment. Previously, the licensee was required to file a final report by August 1, 2000. The licensee states that the entrainment study was completed in 1999, however, damage to the intake structure during the study resulted in atypical fish entrainment rates. Licensee will file a draft report to Forest Service and CDFW by January 1, 2001, and the deadline for final fish entrainment report has been extended to April 1, 2001.<br>**March 22, 2002: Order Approving and Modifying Fish Mitigation Proposal under Article 405**<br>The Order approved licensee's offsite mitigation proposal for stocking trout in Silver Lake downstream of the Rush Creek Project and not in Gem and Agnew lakes due to the presence of mountain yellow-legged frog, at the time, a species proposed for listing as endangered under the Endangered Species Act. |
| 406 | **Transmission Line Relocation Plan:** Within one year of license issuance, licensee is required to file the plans for relocating a segment of transmission line. | Deleted | **May 19, 1997: Order on Rehearing and Staying New License in Part**<br>The Order deleted License Article 406. FERC determined the transmission line segment in question was not within its licensing jurisdiction. |
| 407 | **Licensee Permissions:** Licensee shall have the authority to grant certain permissions for project lands and waters and convey easements, right of ways, or fee titles. | Ongoing Compliance | — |
| 501 | **Headwater Benefits Plan:** If the project was directly benefitted by the construction work on a storage reservoir or other headwater improvement during the term of the original license, the licensee is required to reimburse the owner of the headwater improvements for those benefits. | Ongoing Compliance | — |
| Forest Service 4(e) Condition No. 1 | **Requirement to Obtain a Forest Service Special-Use Authorization:** Within six months of license issuance and before starting any activities the Forest Service determines to be of a land-disturbing nature on NFS land, licensee is required to obtain a special-use authorization for the occupancy of NFS lands. | Deleted | **February 29, 2000: Order Amending License, Lifting Stay, and Dismissing Request for Rehearing as Moot**<br>The Order deleted Forest Service 4(e) Condition No. 1. FERC determined that such authorization is not required for the project. The condition was inadvertently listed in the license. |

| License Article / Forest Service 4(e) Condition | Summary of License Article Requirements | Compliance Status | FERC Orders / Letters / Amendments |
|---|---|---|---|
| Forest Service 4(e) Condition No. 2 | **Forest Service Approval of Final Design:** Before construction on NFS land the licensee is required to obtain prior written approval from the Forest Service for all design plans for project components the Forest Service deems as affecting or potentially affecting NFS resources. | Ongoing Compliance | — |
| Forest Service 4(e) Condition No. 3 | **Forest Service Approval of Changes After Initial Construction:** Requires licensee to get written approval from the Forest Service prior to making any changes in the location of any constructed project features or facilities, or in the uses of project lands and waters, or any departure from the requirements of any approved exhibits filed with FERC. | Ongoing Compliance | — |
| Forest Service 4(e) Condition No. 4 | **Forest Service Consultation:** Requires the licensee to consult with the Forest Service each year during the 60 days preceding the anniversary date of the license to discuss measures needed to ensure protection and development of the natural resource values of the project area. Within 60 days following consultation, the licensee is required to file with FERC evidence of the consultation and recommendations made by the Forest Service. | Ongoing Compliance:<br>Last annual meeting conducted April 9, 2024, and summary filed with FERC on May 9, 2024 | **November 22, 2005: Order Revising Section 4(e) Conditions and License Articles Regarding Scheduling of Annual Agency Consultation Meetings**<br>The Order approved consolidation of the annual consultation meetings with the Forest Service and the annual spring meetings with the Forest Service and CDFW for the Lee Vining, Rush Creek, Lundy, and Bishop Creek projects into a single meeting to be held annually by May 15. Further, the Order required annual reports to be filed with FERC no later than July 15 each year. |
| Forest Service 4(e) Condition No. 5 | **Minimum Streamflow Requirements:** Requires the licensee to implement specified minimum instream flow in Rush Creek downstream of project dams; allows temporary modification of minimum instream flows as a result of operating emergencies or for short periods upon agreement of the Forest Service; and requires annual consultation with the Forest Service and CDFW to develop a summer operations and maintenance plan for project facilities. | Ongoing Compliance | **November 5, 1998: Order Granting Extension of Time to Comply with Condition 5**<br>The Order approved licensee's extension of time request to comply with Forest Service 4(e) Condition No. 5 which requires the licensee to provide a continuous minimum flow of 1 cfs. The licensee planned to meet this requirement by constructing a new release facility by the fall of 1998. Licensee states that because of extremely unfavorable weather conditions of heavy snowpack in the Sierra Nevada Mountains and the project area, access to the site was delayed until mid-July. The deadline for constructing a new release facility is extended to October 31, 1999.<br>**November 22, 2005: Order Revising Section 4(e) Conditions and License Articles Regarding Scheduling of Annual Agency Consultation Meetings**<br>The Order approved consolidation of the annual consultation meetings with the Forest Service and the annual spring meetings with the Forest Service and CDFW for the Lee Vining, Rush Creek, Lundy, and Bishop Creek projects into a single meeting to be held annually by May 15. Further, the Order required annual reports to be filed with FERC no later than July 15 each year. |

| License Article / Forest Service 4(e) Condition | Summary of License Article Requirements | Compliance Status | FERC Orders / Letters / Amendments |
|---|---|---|---|
| Forest Service 4(e) Condition No. 6 | **Guaranteed Flow Device:** Requires licensee to construct, operate, and maintain minimum instream flow and reservoir level monitoring devices. Requires devices to be installed within one year of license issuance. Requires licensee to file an annual stream flow and reservoir levels report with the Inyo National Forest by December 31 of each year. | Ongoing Compliance:<br>Reports filed with the Inyo National Forest each year by April 1. | **October 10, 1997: Order Granting Extension of Time to Complete Installation of Stream Gaging Stations etc.**<br>The Order approved licensee's extension of time request to comply with Forest Service 4(e) Condition No. 6. Licensee states that most gaging station locations were inaccessible at the time of issuance of the license in midwinter and their installation is currently underway. The deadline for completing installation of the stream gaging stations is extended to October 30, 1998.<br>**November 5, 1998: Order Granting Extension of Time to Comply with Condition 6**<br>The Order approved licensee's extension of time request to comply with Forest Service 4(e) Condition No. 6 which requires the licensee to install a water measurement control system with continuously recording stream gages below Rush Meadows Dam by October 30, 1998. The licensee states that because of extremely unfavorable weather conditions of heavy snowpack in the Sierra Nevada Mountains and the project area, access to the site was delayed until mid-July. The deadline for installing the stream gaging station is extended to October 31, 1999.<br>**June 28, 2001: Order Amending Forest Service Condition Number 6**<br>The Order amended the consultation requirement to require the licensee to file the stream flow and reservoir levels report for the project by April 1 of each year for the preceding water year. The report is to be filed with the Inyo National Forest. |
| Forest Service 4(e) Condition No. 7 | **Riparian Monitoring and Reporting:** Requires licensee to conduct a riparian monitoring program, and specifies agency consultation and reporting requirements to be implemented over the term of the license. | Ongoing Compliance:<br>Monitoring conducted consistent with program developed in consultation with the Forest Service.<br>Most recent monitoring was conducted in 2018 (postponed from 2017). The next monitoring event is scheduled to occur in 2025. | **July 7, 2017: Order Issuing Extension of Time**<br>The Order approved licensee's extension of time request filed on June 29, 2017, in order to comply with riparian and aquatic monitoring requirements. Licensee requested a one-year extension to complete the monitoring schedule for 2017. Licensee reports that Rush Creek is experiencing unusually high flows corresponding with snowmelt and the extension is to allow for safe monitoring conditions. |

| License Article / Forest Service 4(e) Condition | Summary of License Article Requirements | Compliance Status | FERC Orders / Letters / Amendments |
|---|---|---|---|
| Forest Service 4(e) Condition No. 8 | **Recreation and Wilderness Management:** Requires licensee to maintain specified reservoir elevations based on season and water year type; and adherence to CDFW standards for ramping of flows during annual drawdown of project reservoirs. The License Article also limits motorized uses within the Ansel Adams Wilderness boundary and requires submittal of plans for the construction of three new toilet facilities at the Oh! Ridge Campground and the relocation of a segment of the 115 kV transmission line right of way within one year of license issuance. | Ongoing Compliance:<br>Per FERC Order, SCE currently operates the Project reservoirs to maintain seismic restricted water levels at Waugh Lake (9,392.1 feet), Gem Lake (9,027.5 feet), and Agnew Lake (completely drained). | **February 29, 2000: Order Amending License, Lifting Stay, and Dismissing Request for Rehearing as Moot**<br>The Order amended Forest Service 4(e) Condition No. 8 per the December 6, 1999 request by the Forest Service, including: (1) revisions to reservoir level requirements to provide operational flexibility to help reduce potential flood conditions at the project; (2) allowed use of the Gem Lake Motor Barge to conduct routine operation and maintenance activities within the Ansel Adams Wilderness; and (3) deleted the final paragraph regarding installation of toilet facilities and relocation of a segment of transmission line at the Oh! Ridge Campground.<br>**June 28, 2012: Reservoir Drawdown for Rush Meadows Dam and Gem Lake Dam**<br>FERC concurrence with SCE's updated seismic risk analysis for Waugh and Gem developments that indicated a potential dam safety issue due to seismic loading; and SCE's request for temporary variance to reduce water levels in Waugh Lake to an elevation of 9,392.1 feet and in Gem Lake to an elevation of 9,027.5 feet for the period of July 1, 2012, through September 4, 2015, to allow for seismic upgrades.<br>**August 8, 2012: Order Modifying and Approving Request for Temporary Variance of Lake Level Requirements under Article 401 and Condition 4(e) Condition 8**<br>The Order approved SCE's request for a temporary variance to dewater Agnew Lake for the purpose of installing a geomembrane liner to the upstream face of Agnew Lake Dam.<br>**April 24, 2013: Interim Reservoir Operation Plan for Agnew Lake Dam**<br>FERC concurrence with SCE's interim reservoir operation plan and acceptance of schedule to complete a detailed structural stability and sensitivity analysis by June 30, 2013. Letter required Agnew Lake remain drained until the Board of Consultants has concurred with an analysis demonstrating that the dam will be safe under seismic loading and FERC has concurred with the Board's findings.<br>**October 27, 2016: Plan and Schedule for the Seismic Retrofit of the Rush Creek Project**<br>FERC letter requiring Waugh, Gem, and Agnew lakes remain at or below the agreed-upon restricted reservoir elevation until further notice. |
| Forest Service 4(e) Condition No. 9 | **Hazardous Substances Plan:** Within one year of license issuance and at least 60 days before starting any activities the Forest Service determines to be of a land-disturbing nature on NFS land, licensee is required to file a plan for oil and hazardous substances storage and spill prevention and cleanup. | Complete: Plan for Oil and Hazardous Waste Storage and Spill Prevention and Cleanup filed October 15, 1997<br>Ongoing Compliance | **November 14, 1997: Letter Approval of Plan**<br>FERC letter stating the Plan for Oil and Hazardous Waste Storage and Spill Prevention and Cleanup filed on October 15, 1997, fulfills the requirements of Forest Service 4(e) Condition No. 9. |

| License Article / Forest Service 4(e) Condition | Summary of License Article Requirements | Compliance Status | FERC Orders / Letters / Amendments |
|---|---|---|---|
| Forest Service 4(e) Condition No. 10 | **Erosion Control Plan**: Within one year of license issuance and before starting any activities the Forest Service determines to be of a land-disturbing nature on NFS land, licensee is required to file a plan for the control of erosion, stream sedimentation, dust, and soil mass movement (*also refer to License Article 402*). | Complete: Plan for Control of Erosion, Stream Sedimentation, Soil Mass Movement, and Dust filed October 15, 1997<br>Ongoing Compliance | **November 14, 1997: Letter Approval of Plan**<br>FERC letter stating the Plan for Control of Erosion, Stream Sedimentation, Soil Mass Movement, and Dust filed on October 15, 1997, fulfills the requirements of Forest Service 4(e) Condition No. 10. |
| Forest Service 4(e) Condition No. 11 | **Spoil Disposal Plan:** Within one year of license issuance and before starting any activities the Forest Service determines to be of a land-disturbing nature on NFS land, licensee is required to file a plan for the storage and/or disposal of excess construction/tunnel spoils and slide material. | Complete: Plan for Storage and/or Disposal of Excess Construction/Tunnel Spoils and Slide Materials filed October 15, 1997<br>Ongoing Compliance | **November 14, 1997: Letter Approval of Plan**<br>FERC letter stating the Plan for Storage and/or Disposal of Excess Construction/Tunnel Spoils and Slide Materials filed on October 15, 1997, fulfills the requirements of Forest Service 4(e) Condition No. 11. |
| Forest Service 4(e) Condition No. 12 | **Visual Resource Protection Plan:** Before starting any activities the Forest Service determines to be of a land-disturbing nature on NFS land, licensee is required to file a plan for the design and construction of project facilities in order to preserve or enhance its visual character. | Complete: Plan for the Design and Construction of Project Facilities in Order to Preserve or Enhance Visual Quality filed October 15, 1997<br>Ongoing Compliance | **November 14, 1997: Letter Approval of Plan**<br>FERC letter stating the Plan for the Design and Construction of Project Facilities in Order to Preserve or Enhance Visual Quality filed on October 15, 1997, fulfills the requirements of Forest Service 4(e) Condition No. 12. |
| Forest Service 4(e) Condition No. 13 | **Threatened, Endangered, and Sensitive Species Management Plan:** Within one year of license issuance and before starting any activities the Forest Service determines to be land-disturbing nature on NFS land, licensee is required to file a detailed implementation plan for the mitigation of impacts to sensitive, threatened, and endangered plant and animal species located within the area to be disturbed. | Complete: Threatened, Endangered, and Sensitive Species Management Plan filed October 15, 1997<br>Ongoing Compliance | **November 14, 1997: Letter Approval of Plan**<br>FERC letter stating the Threatened, Endangered, and Sensitive Species Management Plan filed on October 15, 1997, fulfills the requirements of Forest Service 4(e) Condition No. 13. |
| Forest Service 4(e) Condition No. 14 | **Cultural Resources Management Plan:** Within one year of license issuance, licensee is required to submit for Forest Service approval a multi-year plan to implement provisions of the "Management Plan for Historic and Archaeological Resources Associated with the Rush Creek Hydroelectric Project" (White 1990) concerning the management of those resources within the project boundaries (*also refer to License Article 403*). | Complete: Implementation plan submitted October 8, 1997<br>Ongoing Compliance | — |

Key:
CDFW = California Department of Fish and Wildlife
FERC = Federal Energy Regulatory Commission
Forest Service = United States Forest Service
NFS = National Forest System
SCE = Southern California Edison Company
SHPO = State Historic Preservation Officer

# FIGURES

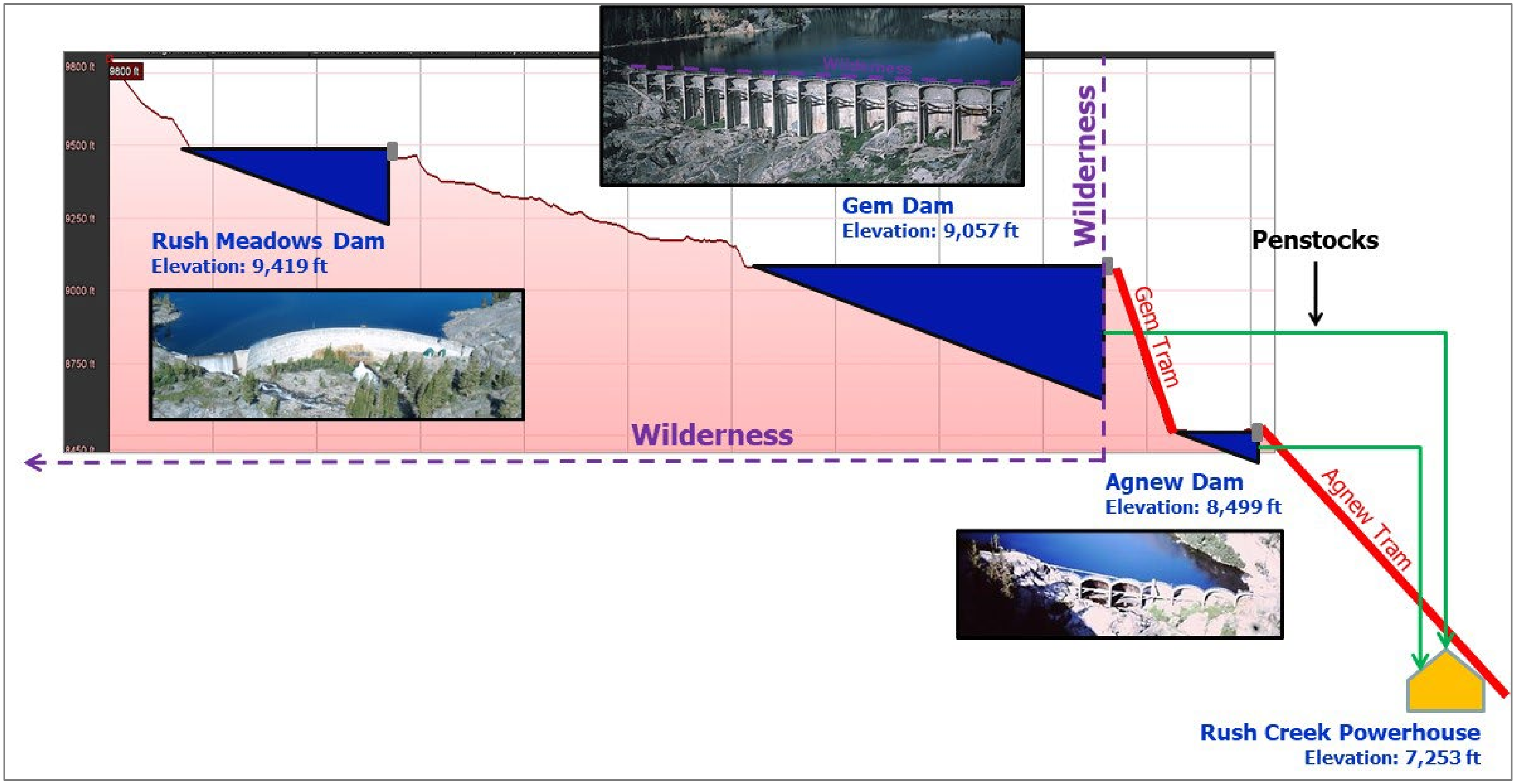



**Figure 4-1. Rush Creek Project Elevation Profile**

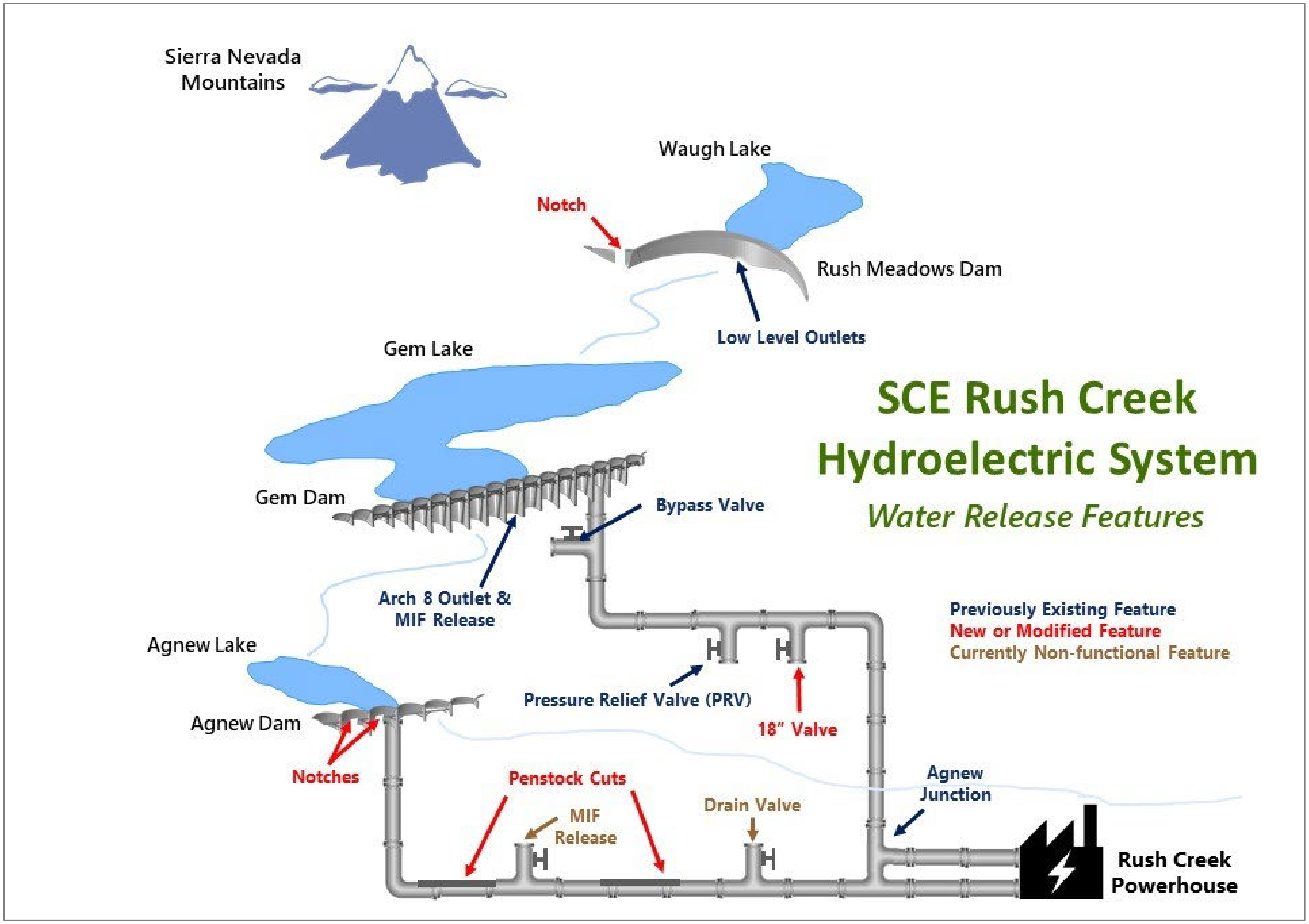



**Figure 4-2. Rush Creek Project Current Water Release Features**

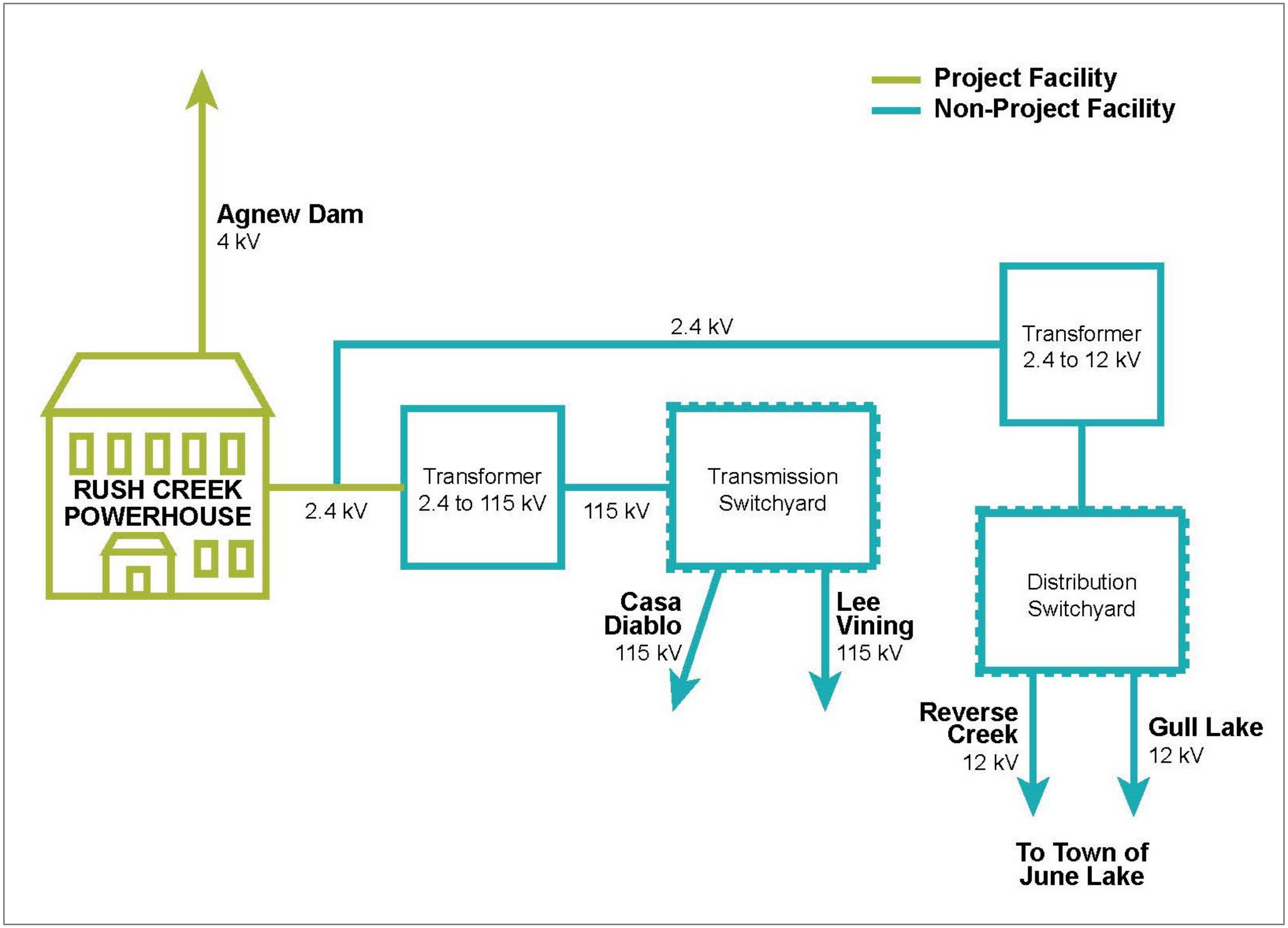



**Figure 4-3. Rush Creek Project Transmission and Distribution Line Diagram**

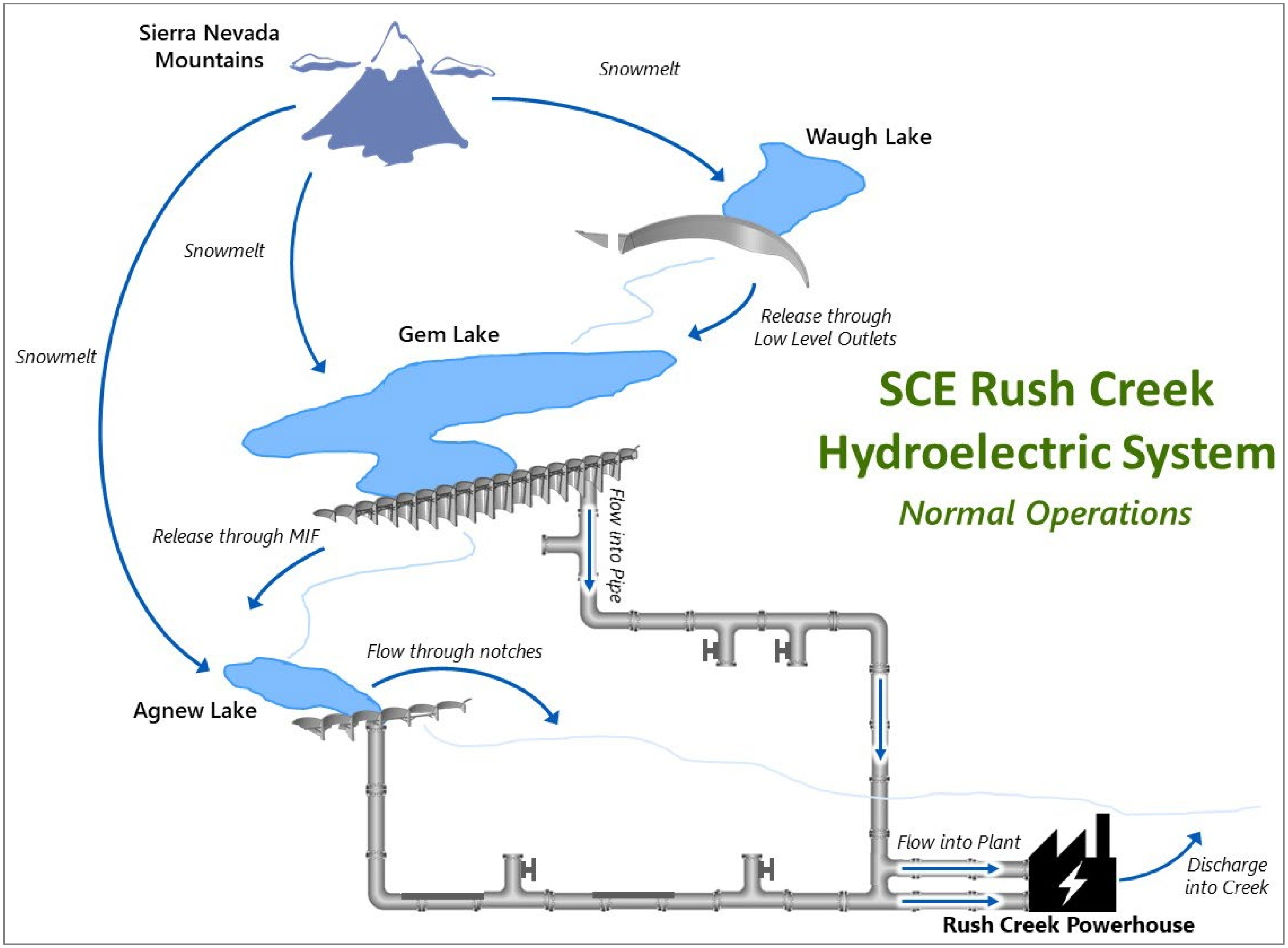



**Figure 4-4. Rush Creek Project Current Normal Operations**

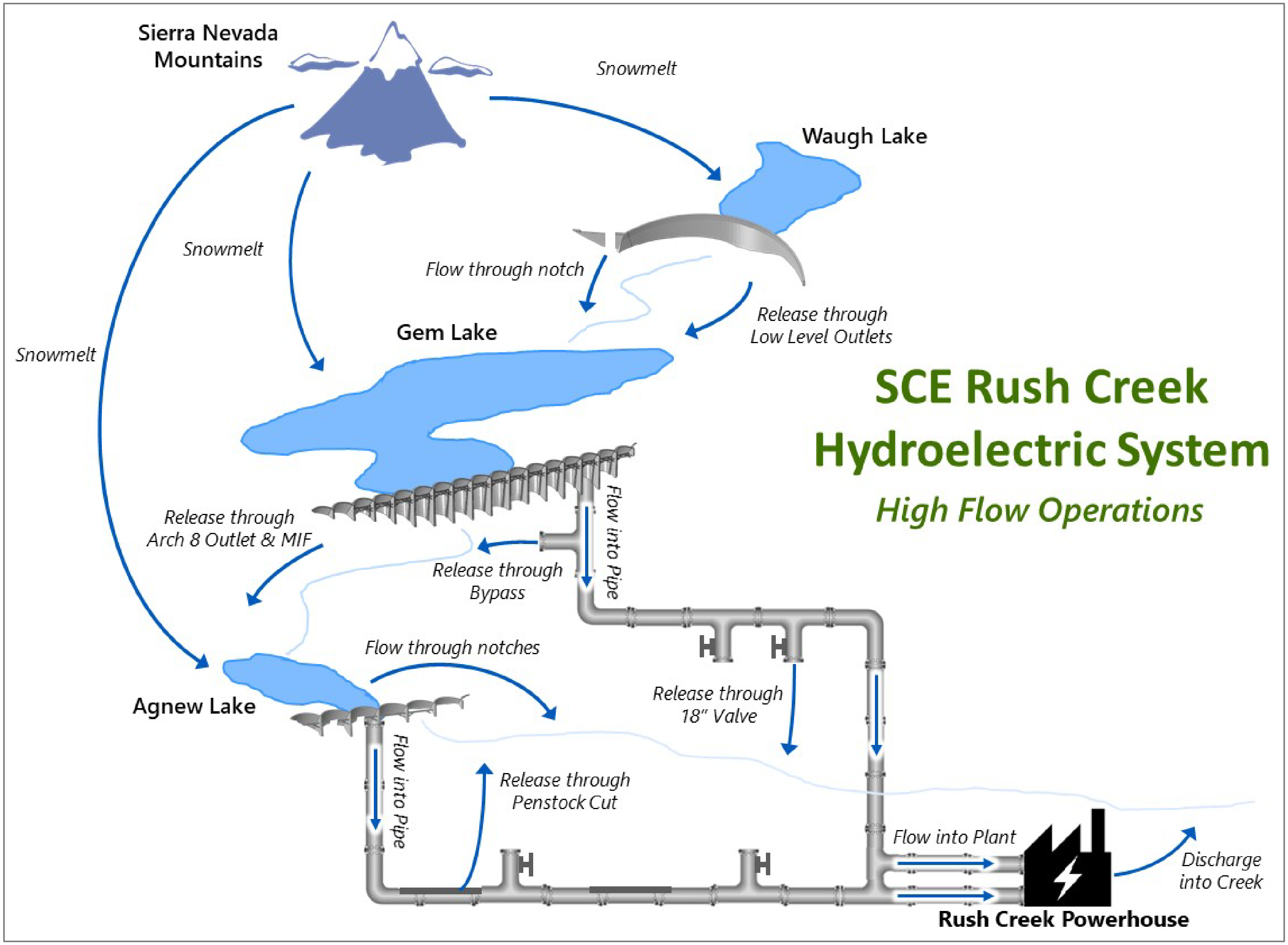



**Figure 4-5. Rush Creek Project Current High-Flow Operations**

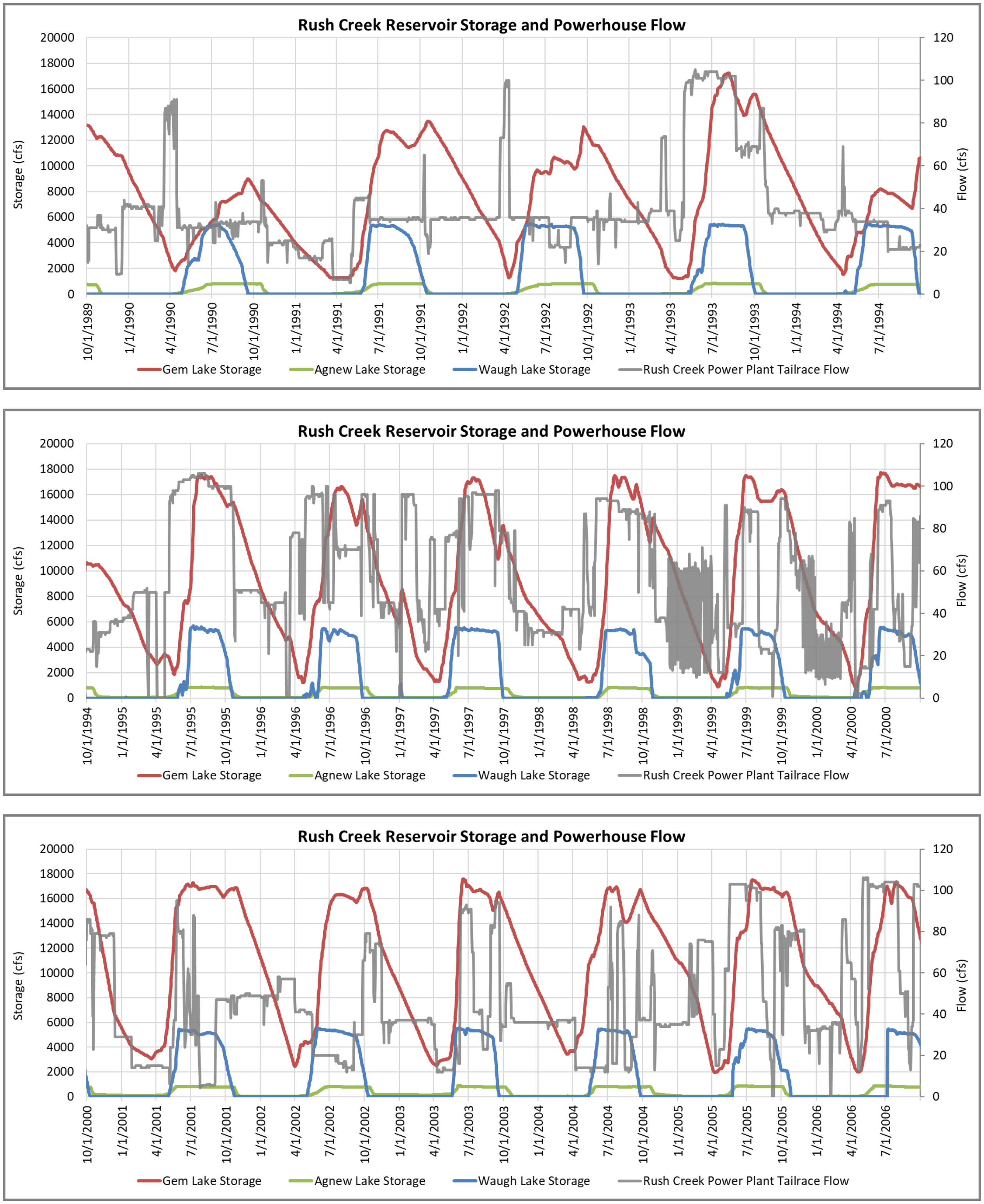



**Figure 4-6. Rush Creek Project Reservoir Storage and Daily Mean Flow at the Rush Creek Powerhouse (USGS 10287300/SCE 367) (WY 1990–2006)**

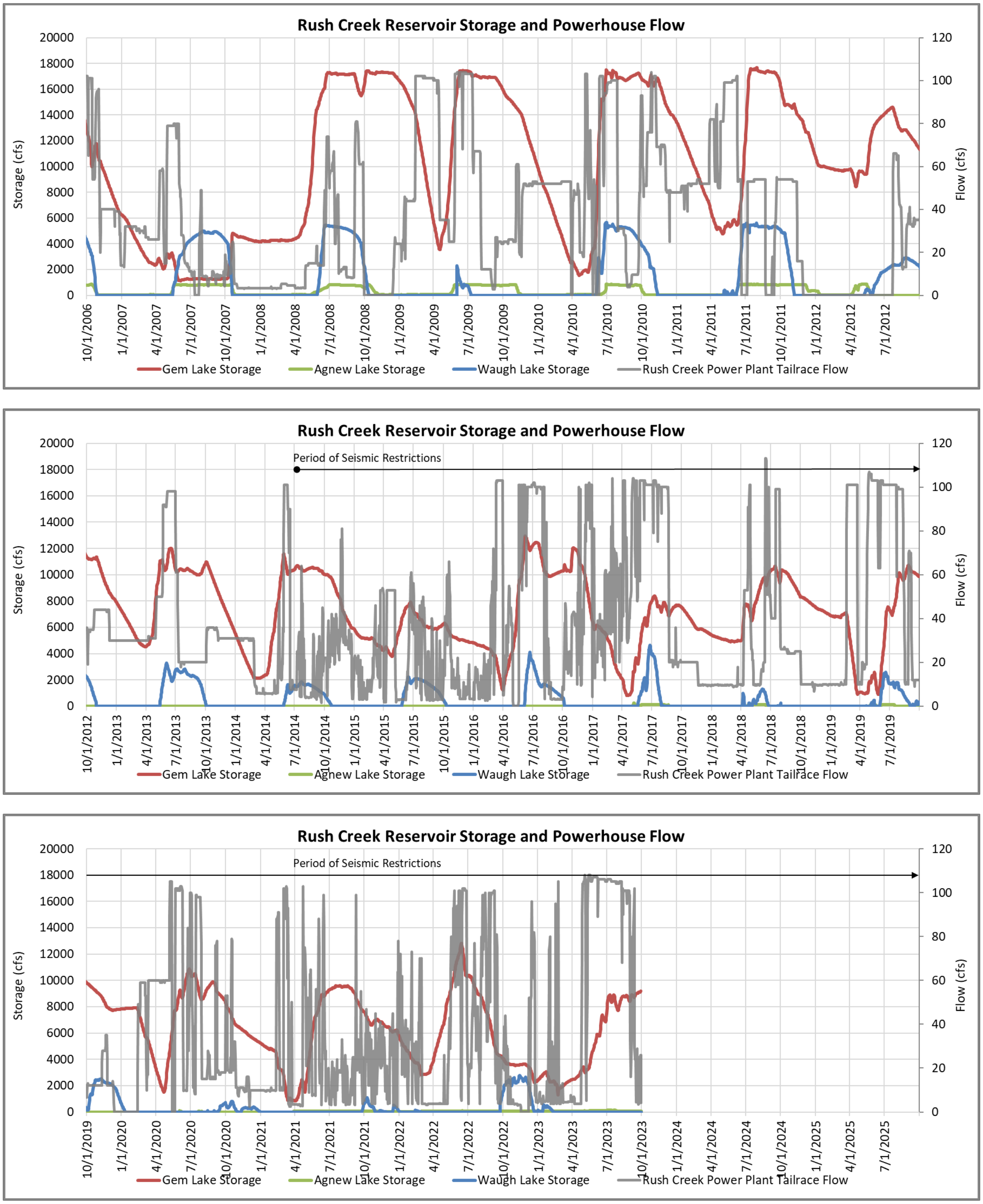
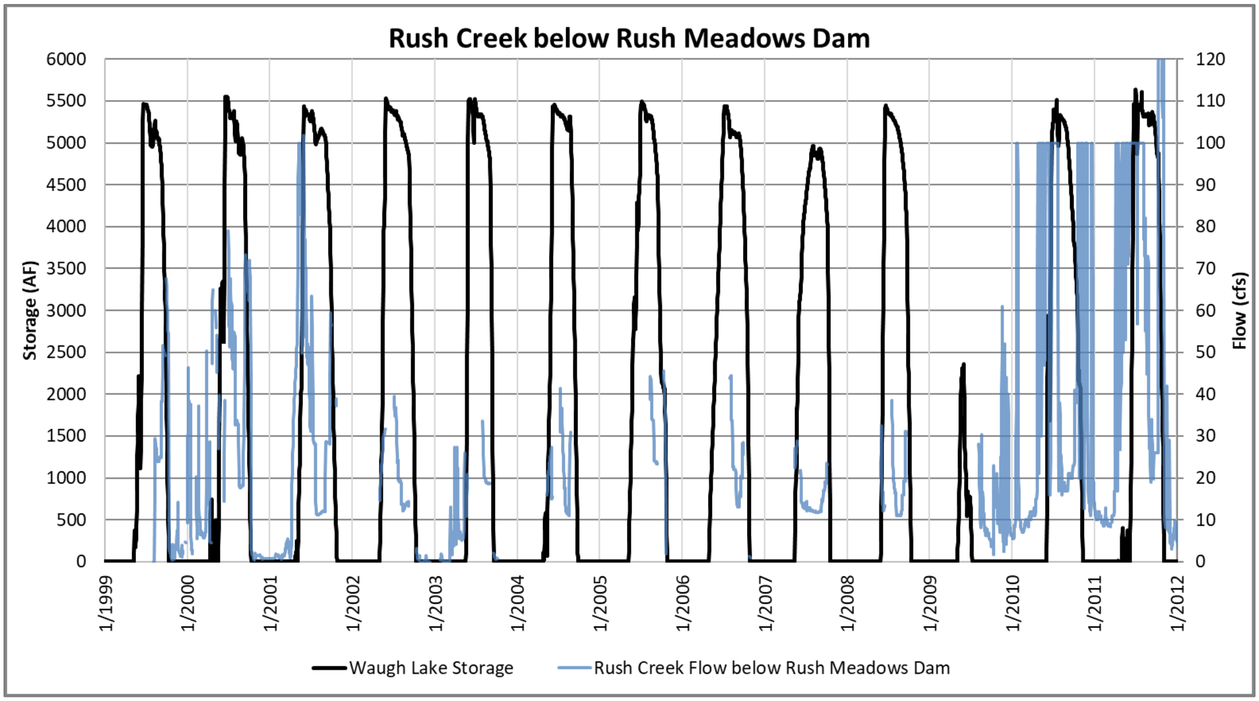



*Figure 4-6. (continued) Rush Creek Project Reservoir Storage and Daily Mean Flow at the Rush Creek Powerhouse (USGS 10287300/SCE 367) (WY 2007–2023)*



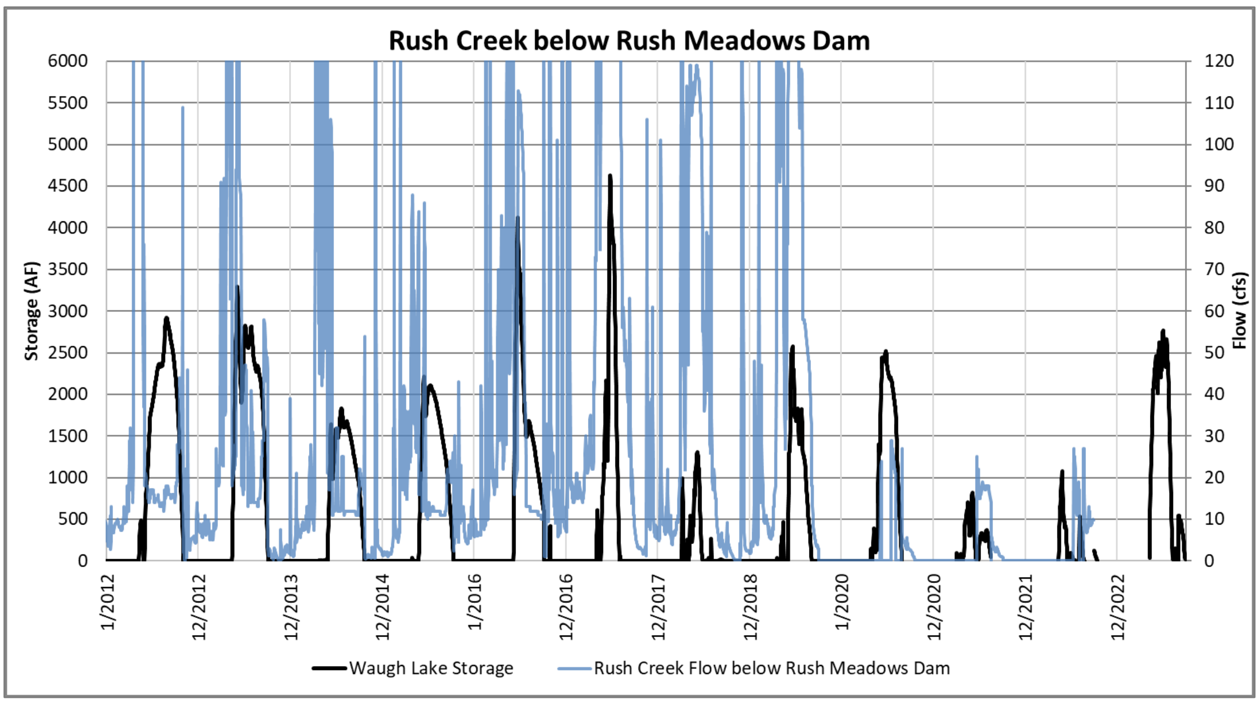
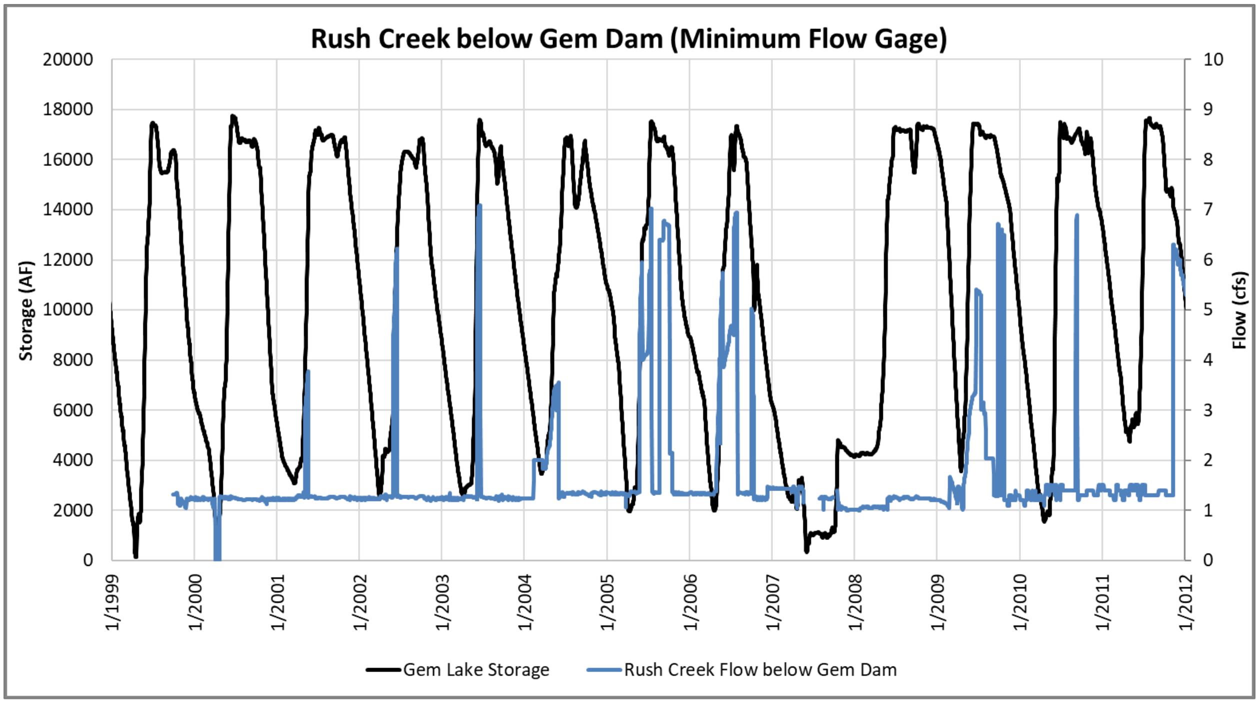
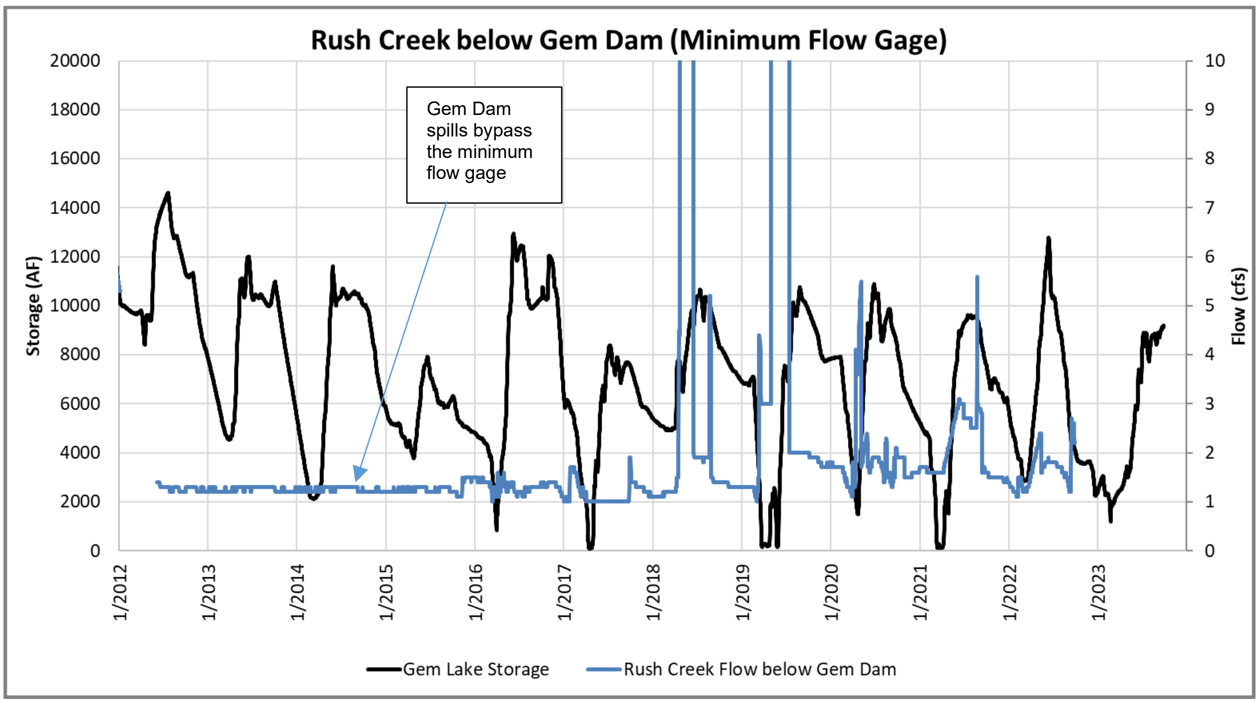




**Figure 4-7. Historical Mean Daily Flows (WY 1999–2023) for Rush Creek Below Rush Meadows Dam (USGS 10287262/SCE 359R) and Waugh Lake Storage**




Note: The flow gage only records the minimum flow pipe release and not reservoir spills. In 2018 and 2019 bypass flow was recorded from another release pipe.

**Figure 4-8. Historical Mean Daily Flows (WY 1999–2023) for Rush Creek Below Gem Dam (USGS 10287281/SCE 352R) and Gem Lake Storage**

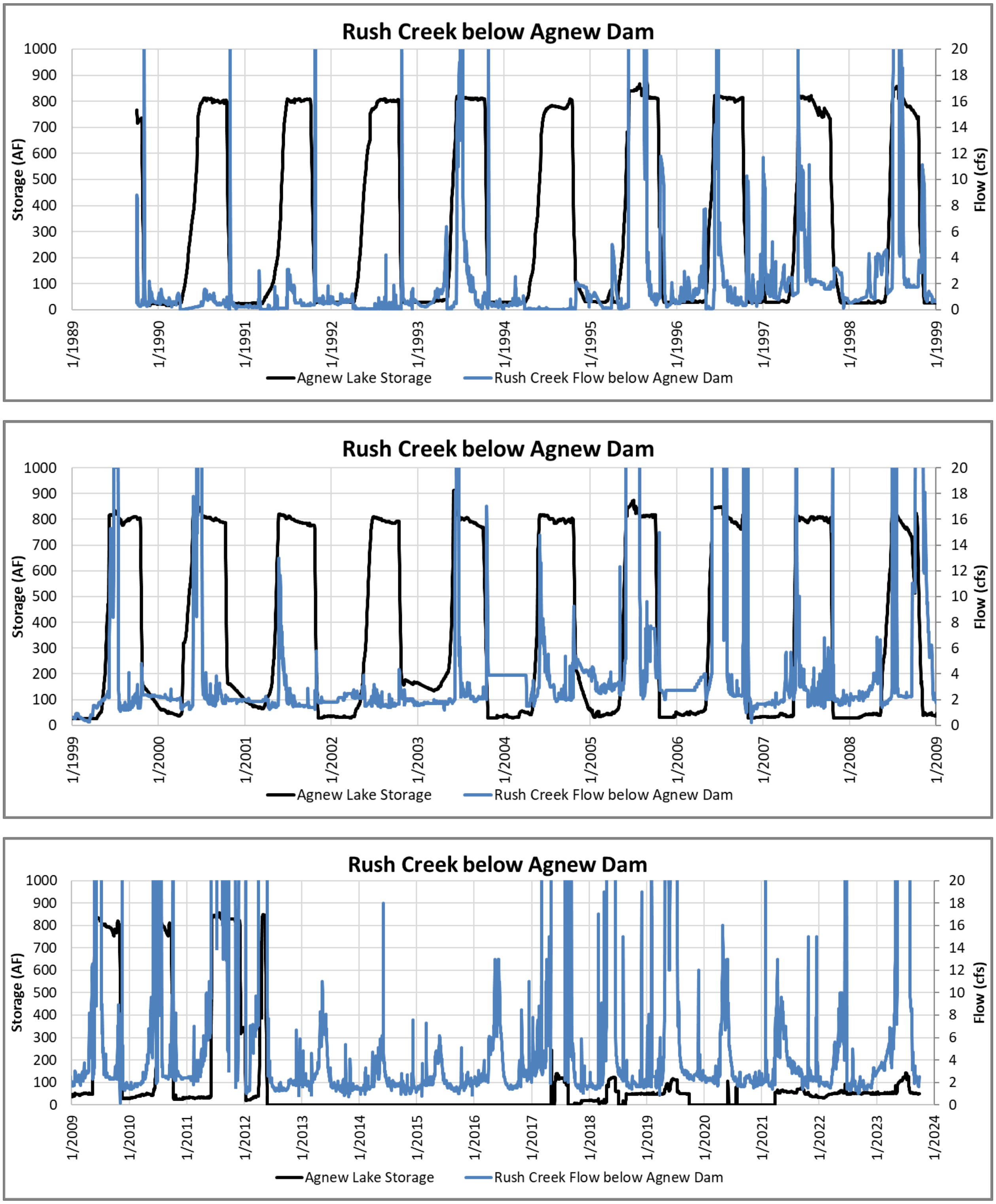



**Figure 4-9. Historical Mean Daily Flows (WY 1990–2023) for Rush Creek Below Agnew Dam (USGS 10287289/SCE 357) and Agnew Lake Storage**

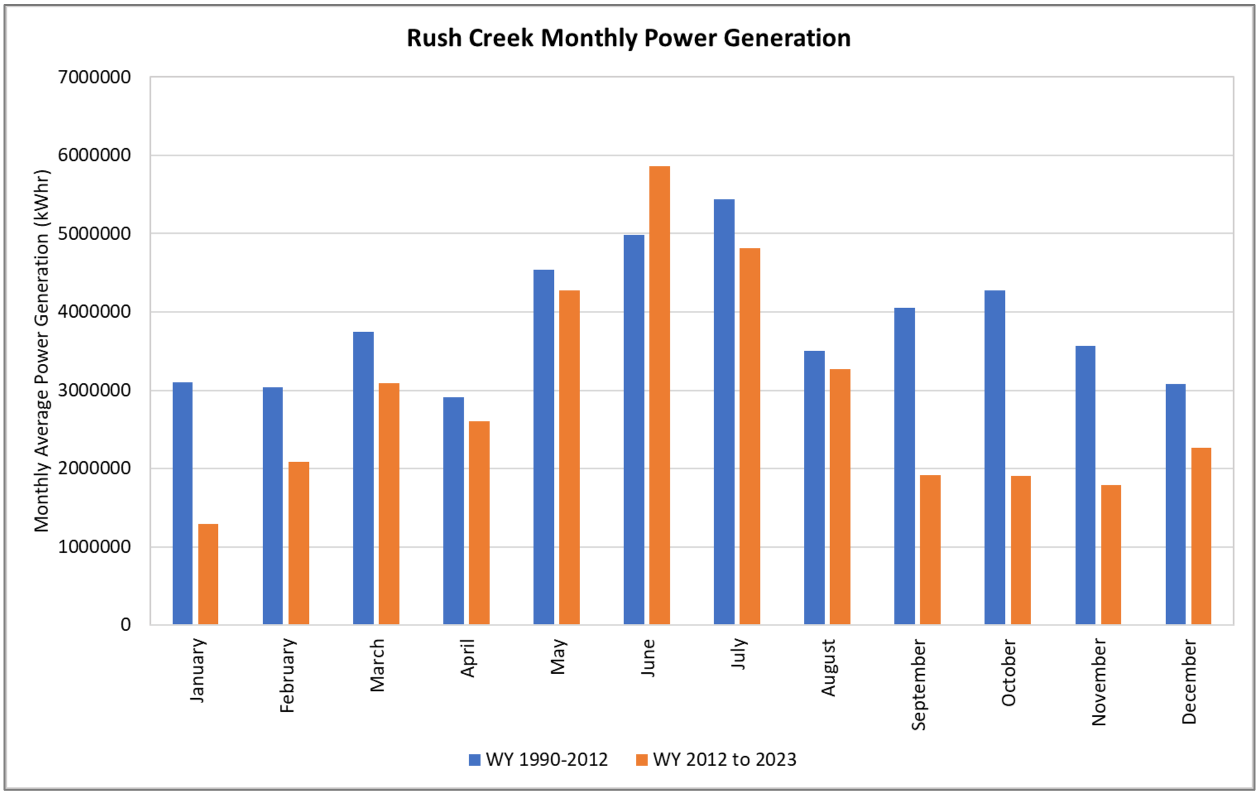



**Figure 4-10. Rush Creek Monthly Power Generation for the Periods of WY 1990–2012 and WY 2012–2023**

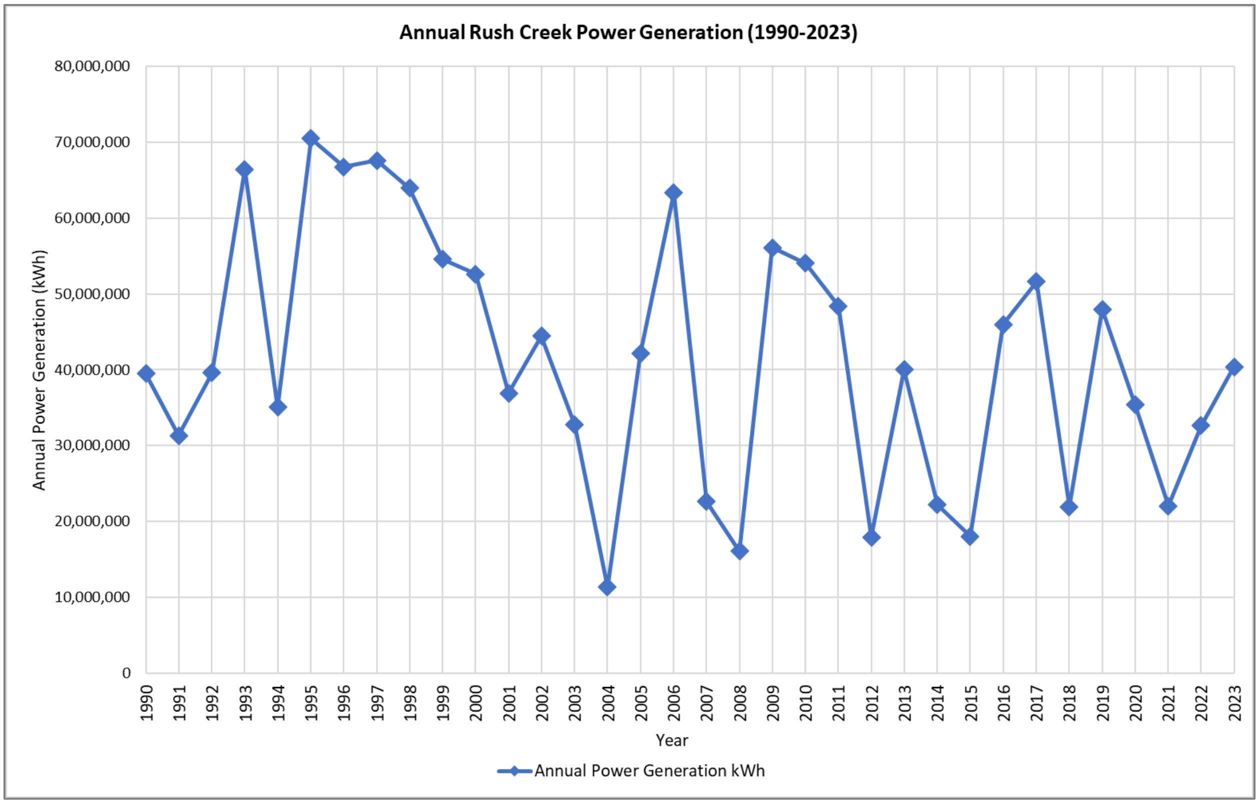
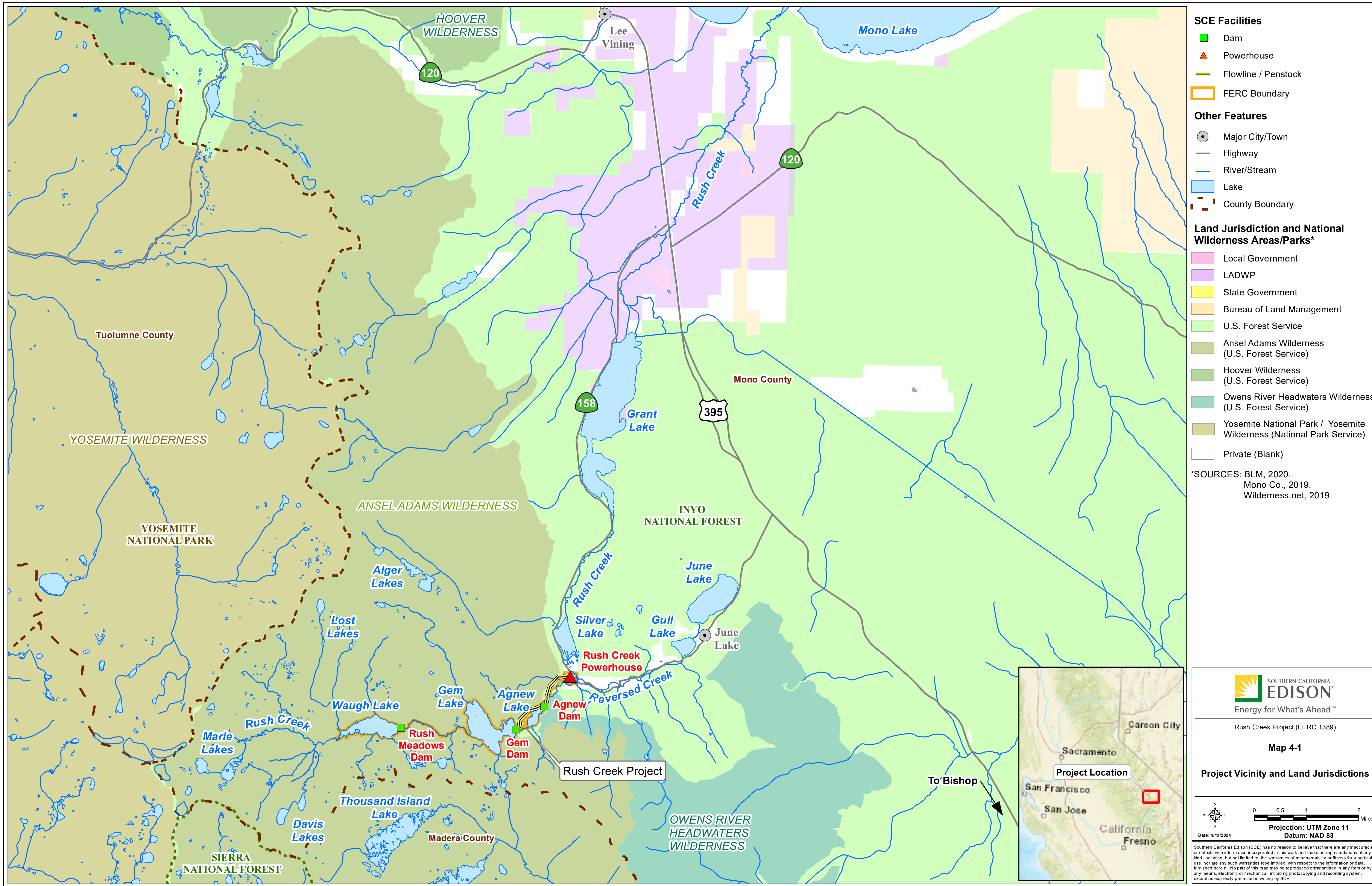
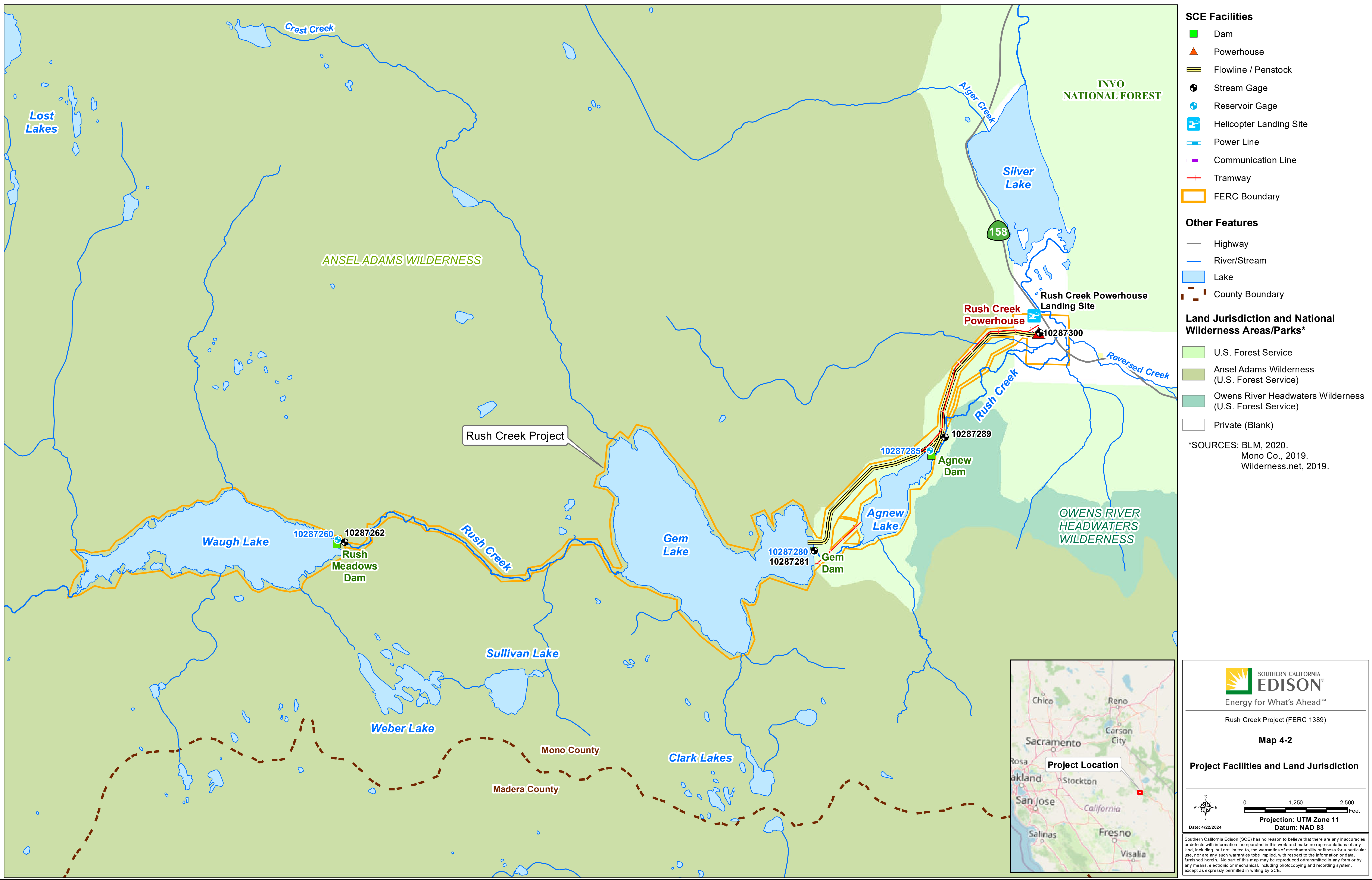



**Figure 4-11. Annual Rush Creek Power Generation (1990–2023)**

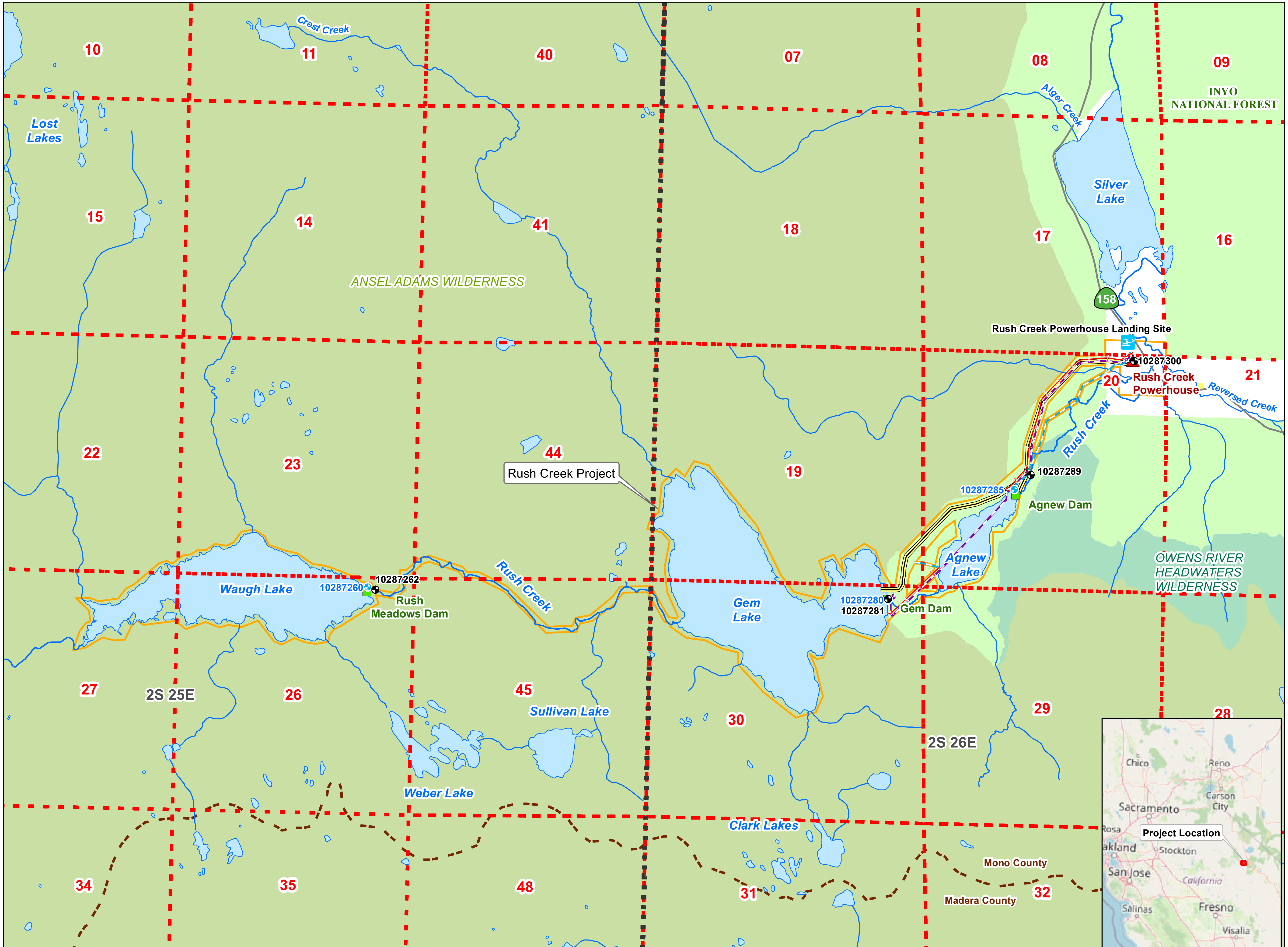
# MAPS




C:\GIS\237800343\map\Rush Creek\SCE_RUSH_CREEK_Juris_Vicinity_17i11i_01.mxd




C:\GIS\237800343\map\Rush Creek\FacilitiesMaps\SCE_RUSH_CREEK_ProjDesc_Juris_17i11i_01.mxd




**SCE Facilities**

- Dam
- Powerhouse
- Flowline / Penstock
- Stream Gage
- Reservoir Gage
- Helicopter Landing Site
- Power Line
- Communication Line
- Tramway
- 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)
- Private (Blank)

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

**Public Land Survey System (PLSS)**

- PLSS Township/Range
- PLSS Section (First Division)

SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead℠

Rush Creek Project (FERC 1389)

**Map 4-3**

**Lands and Water within the FERC Project Boundary by Township, Range, and Section**

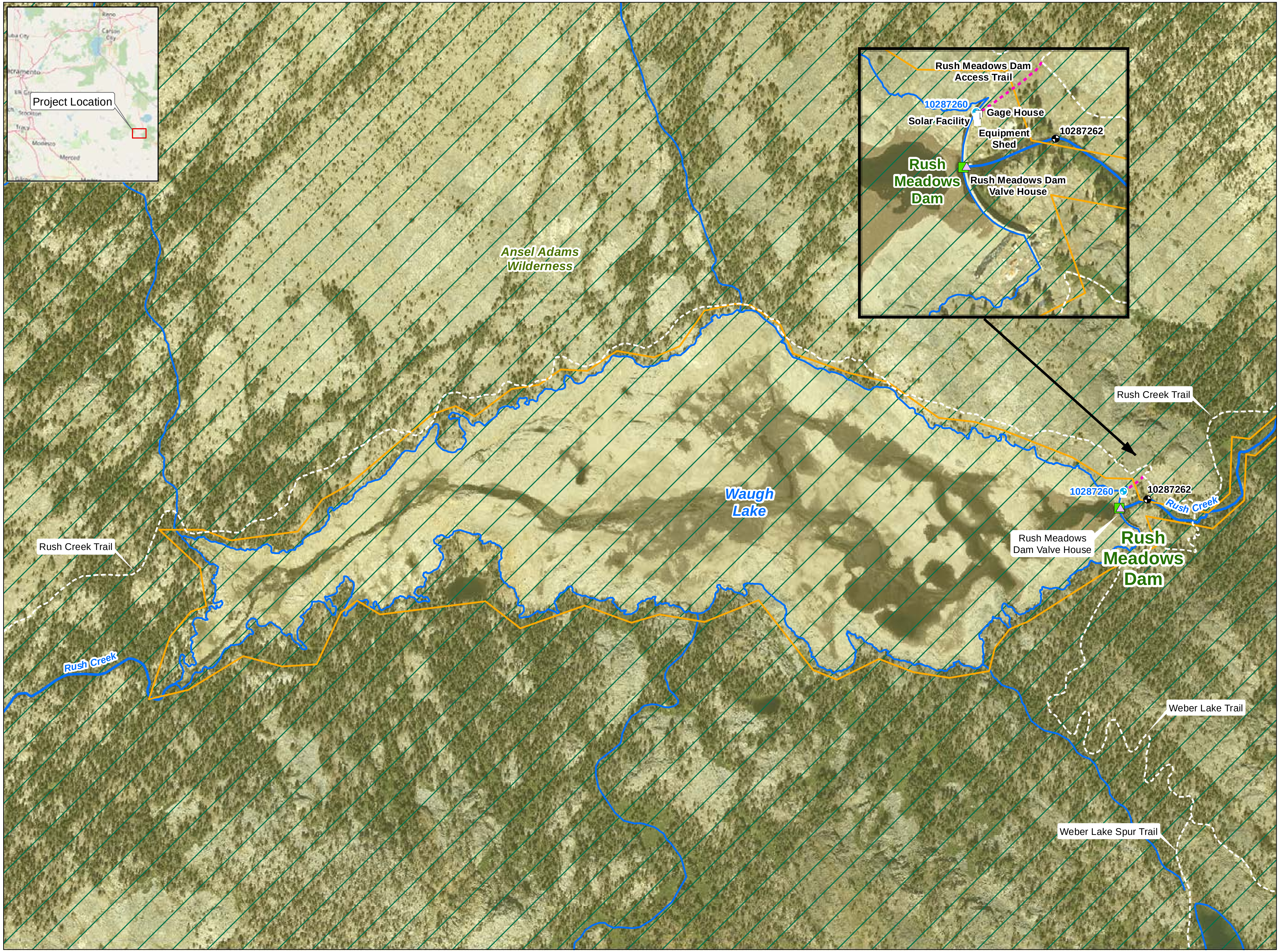
0 1,250 2,500 Feet

Date: 4/22/2024

**Projection: UTM Zone 11**
**Datum: NAD 83**



C:\GIS\237800343\map\Rush Creek\FacilitiesMaps\SCE_RUSH_CREEK_ProjDesc_LandsWatersPLSS_17i11i_01.mxd




**SCE Facilities**

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

**Other Features**

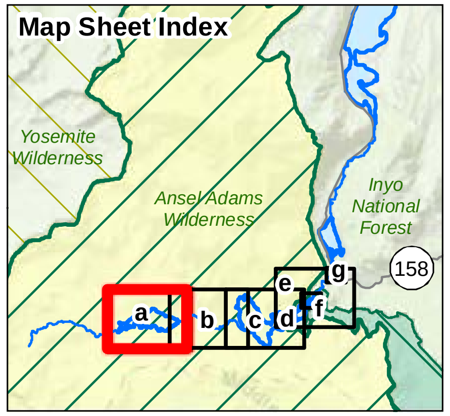
- Watercourse
- Lake
- Non-Project Trail

**Land Management**

National Wilderness Area**

- Ansel Adams Wilderness
- Owens River Headwaters Wilderness

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




SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead℠

Rush Creek Project (FERC 1389)

Map 4-4a

Project Facilities
Rush Meadows Dam/Waugh Lake

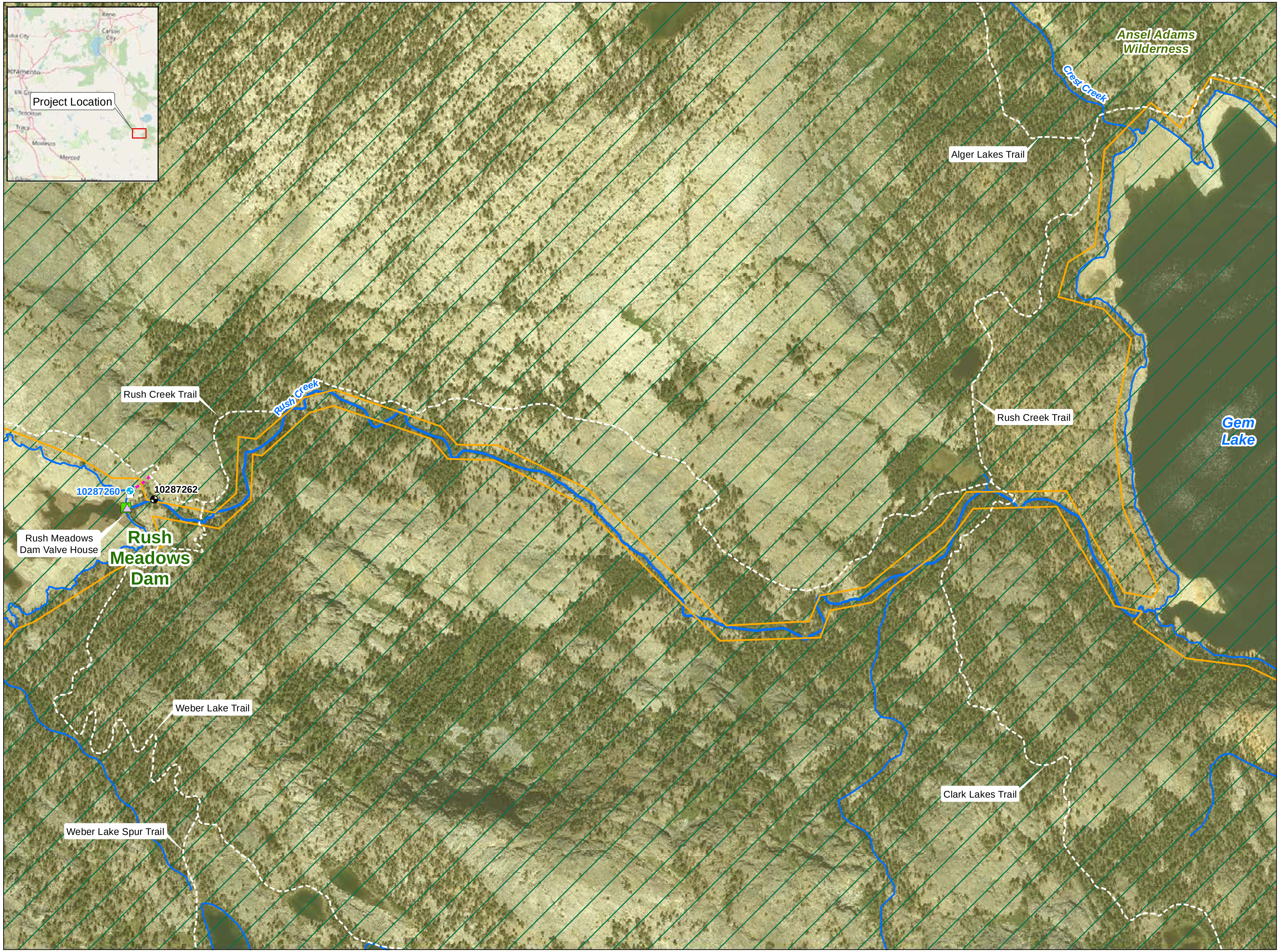
0 250 500 Feet

Date: 5/23/2024

Projection: UTM Zone 11
Datum: NAD 83



C:\GIS\237800343\map\Rush Creek\FacilitiesMaps\SCE_RUSH_CREEK_ProjDesc_17i11i_10.mxd




**SCE Facilities**

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

**Other Features**

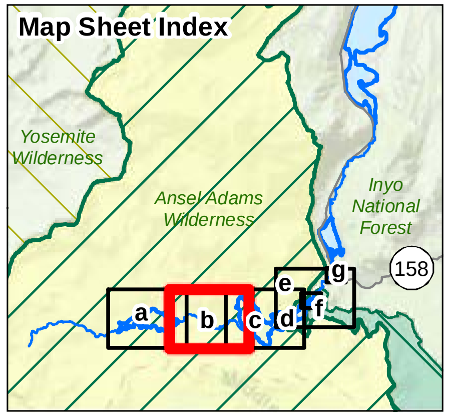
- Watercourse
- Lake
- Non-Project Trail

**Land Management**

National Wilderness Area**

- Ansel Adams Wilderness
- Owens River Headwaters Wilderness

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




Energy for What's Ahead℠

Rush Creek Project (FERC 1389)

**Map 4-4b**

**Project Facilities**
**Rush Meadows Dam/Gem Lake**

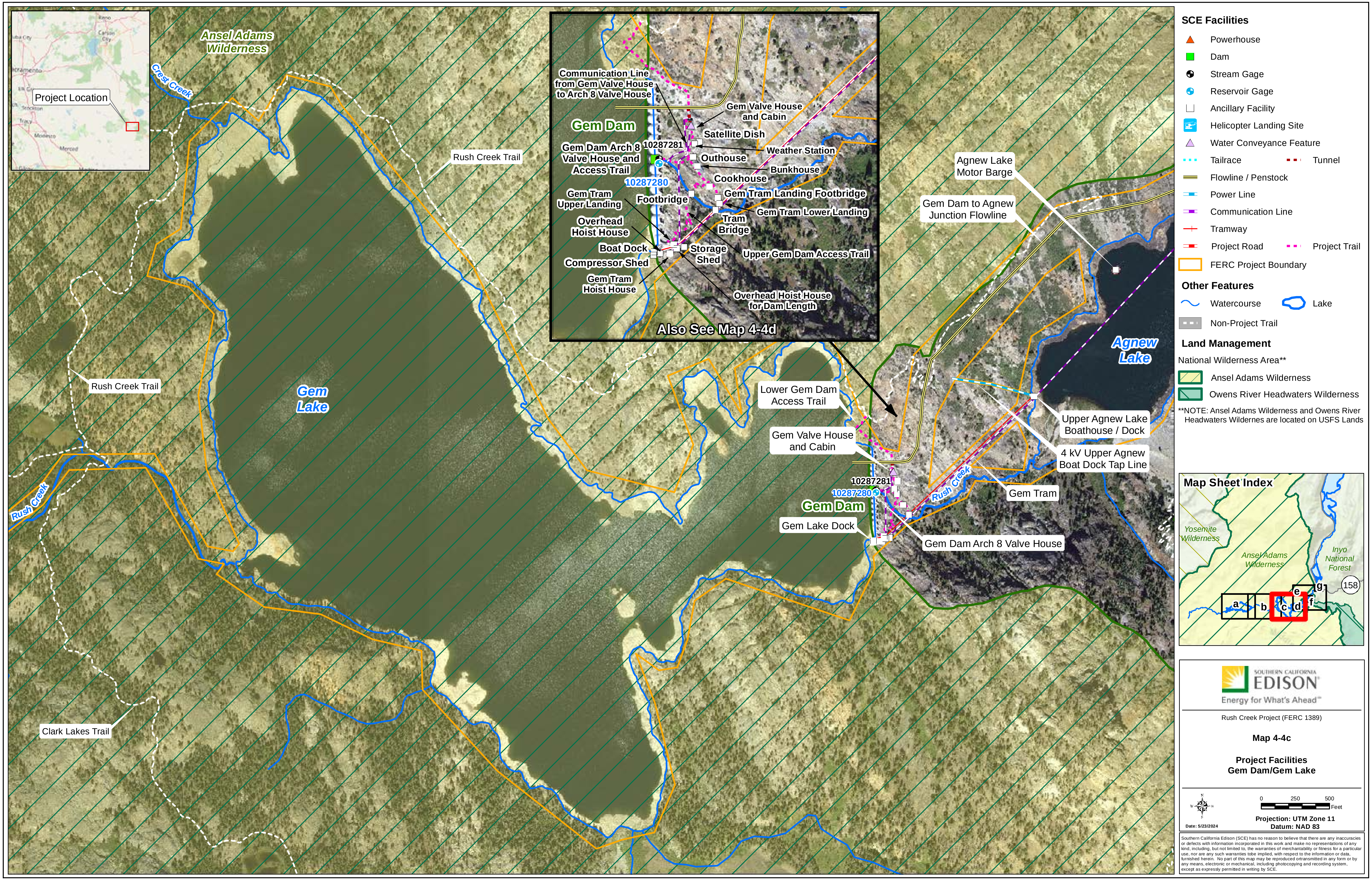
0 250 500 Feet

Date: 5/23/2024

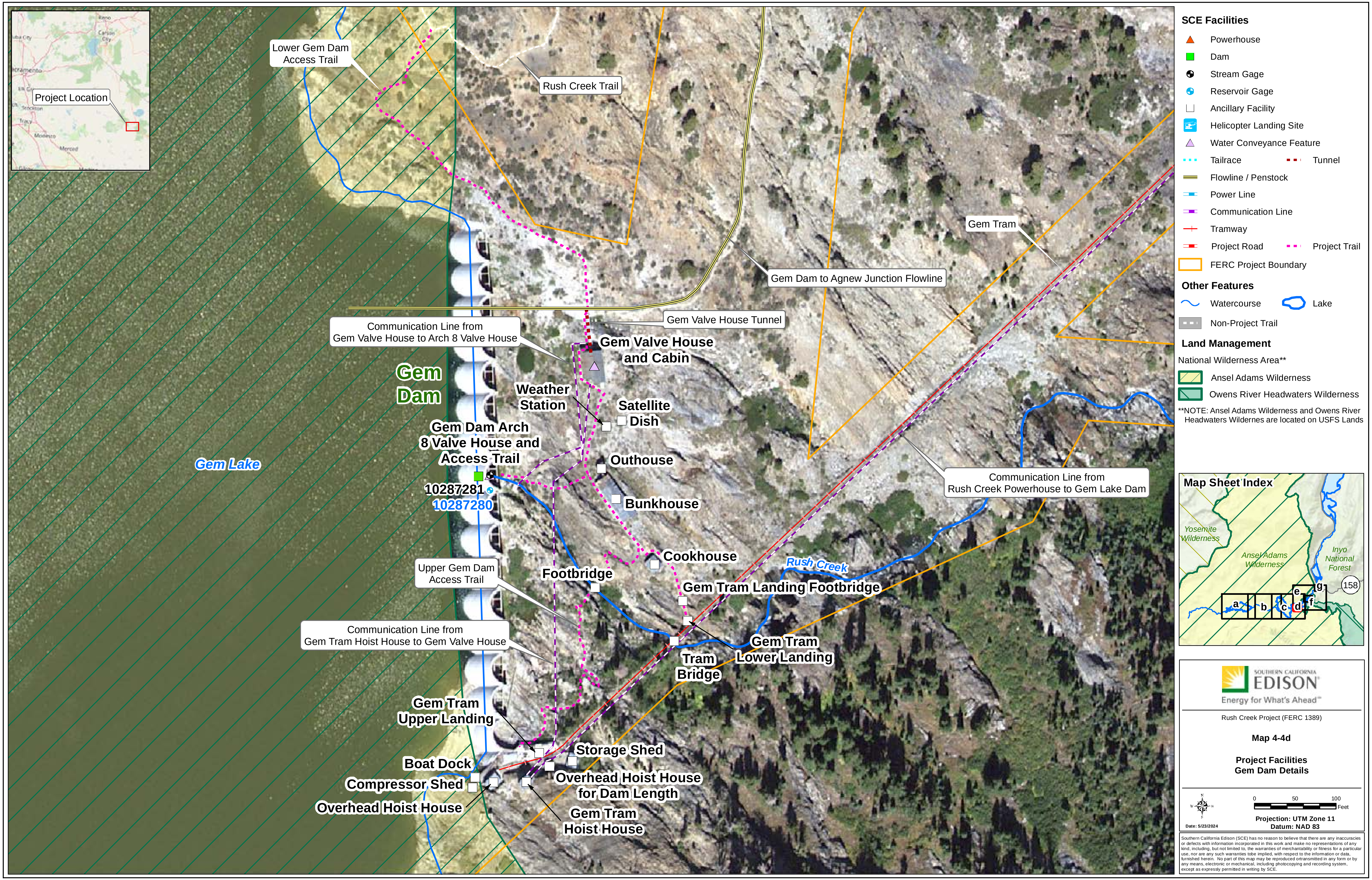
**Projection: UTM Zone 11**
**Datum: NAD 83**



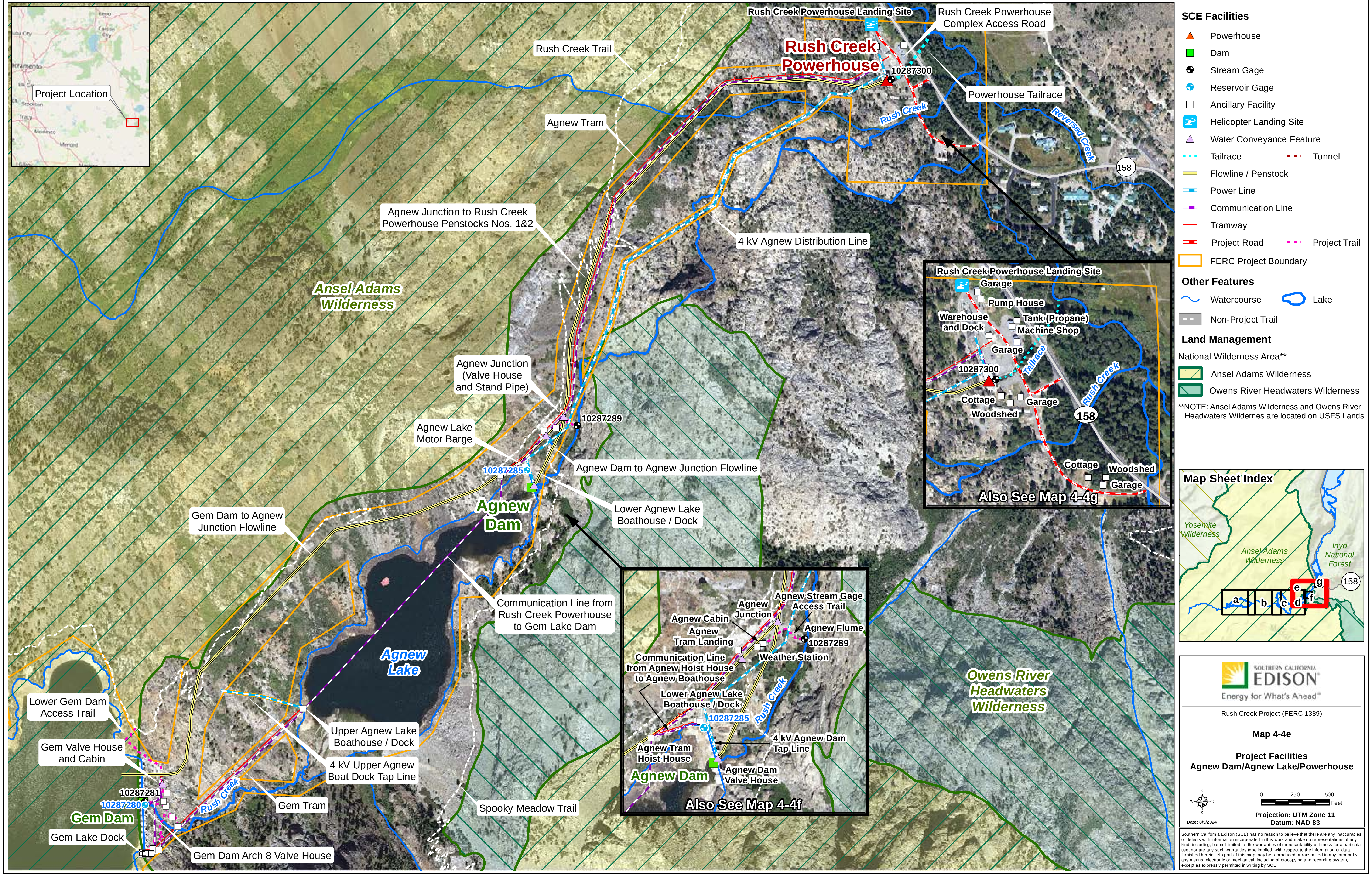
C:\GIS\237800343\map\Rush Creek\FacilitiesMaps\SCE_RUSH_CREEK_ProjDesc_17i11i_10.mxd



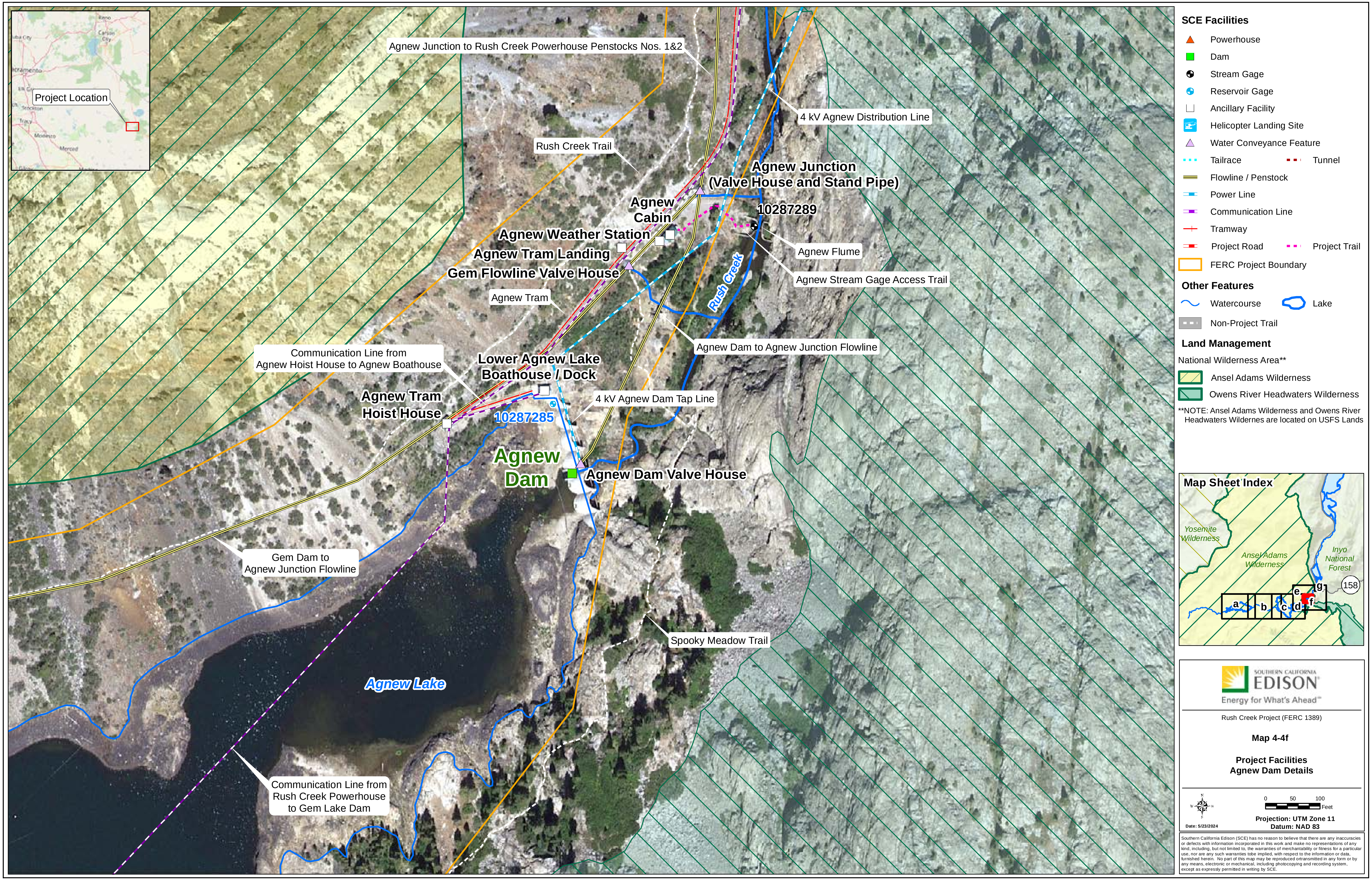

C:\GIS\237800343\map\Rush Creek\FacilitiesMaps\SCE_RUSH_CREEK_ProjDesc_17i11i_10.mxd



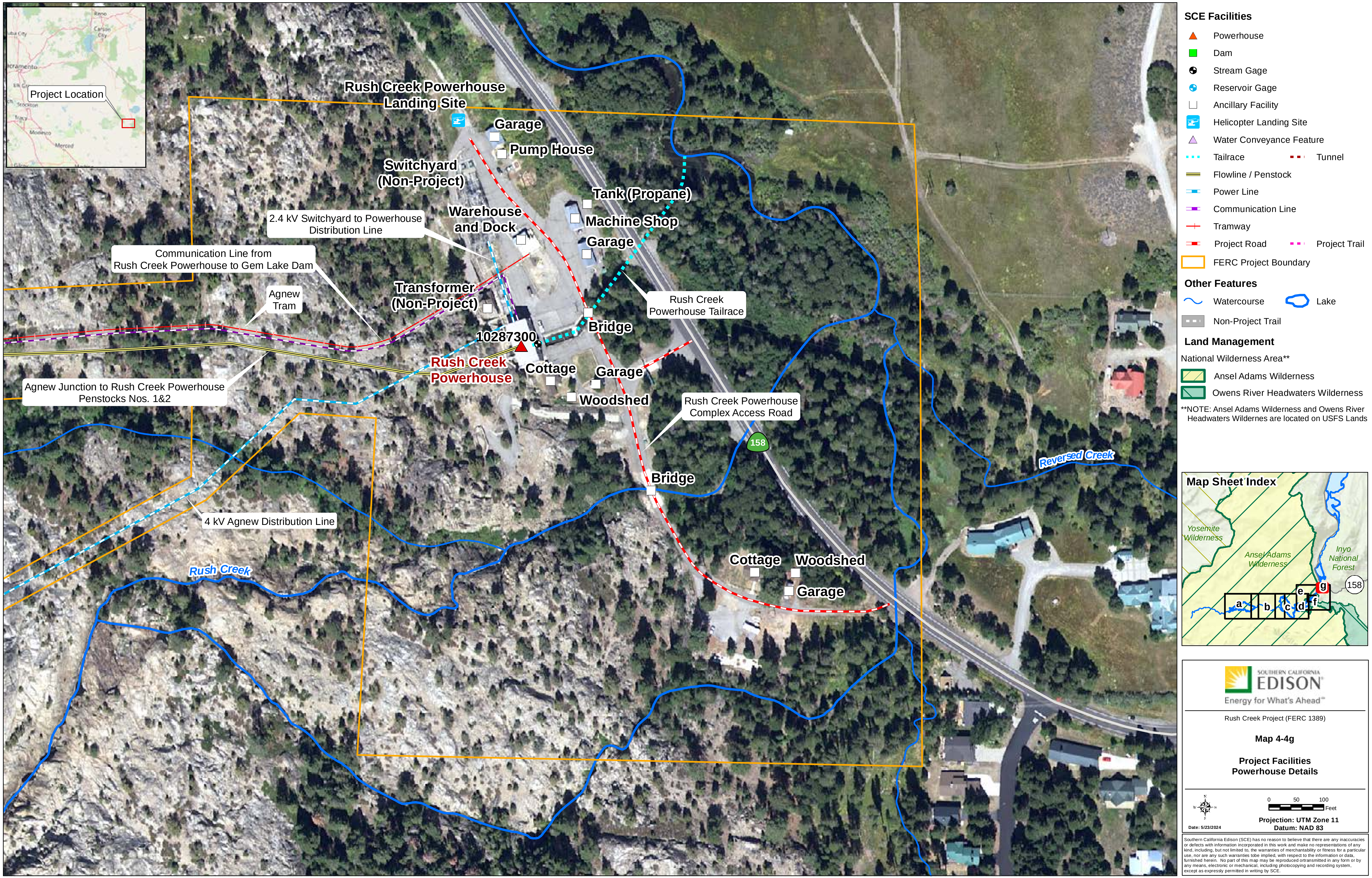

C:\GIS\237800343\map\Rush Creek\FacilitiesMaps\SCE_RUSH_CREEK_ProjDesc_DetailMaps_17i11i_10.mxd




C:\GIS\237800343\map\Rush Creek\FacilitiesMaps\SCE_RUSH_CREEK_ProjDesc_17i11i_10.mxd




C:\GIS\237800343\map\Rush Creek\FacilitiesMaps\SCE_RUSH_CREEK_ProjDesc_DetailMaps_17i11i_10.mxd




C:\GIS\237800343\map\Rush Creek\FacilitiesMaps\SCE_RUSH_CREEK_ProjDesc_DetailMaps_17i11i_10.mxd

## TABLE OF CONTENTS

Page

**5.0 Proposed Action ........ 5-1**
5.1 Introduction ........ 5-1
5.2 Project Facility Modifications ........ 5-1
5.2.1 Rush Meadows Dam Removal ........ 5-2
5.2.2 Agnew Dam Removal ........ 5-3
5.2.3 Gem Dam Retrofit ........ 5-3
5.2.4 Restoration Plans ........ 5-4
5.2.5 Construction Schedule ........ 5-5
5.3 Changes to the Existing FERC Project Boundary ........ 5-6
5.4 Changes in Project Operations ........ 5-6
5.4.1 Minimum Instream Flow ........ 5-7
5.4.2 Reservoir Levels at Gem Lake ........ 5-7
5.4.3 Ramping Rates ........ 5-8
5.5 Changes in Project Maintenance ........ 5-8
5.6 New Measures ........ 5-8
5.6.1 Construction Measures ........ 5-8
5.6.2 Environmental Measures ........ 5-9

## LIST OF TABLES

Table 5-1. Proposed Project Facilities ........ 5-11
Table 5-2. Gem Dam and Lake Specifications ........ 5-14

## List of Figures

Figure 5-1. Cross Section of the Existing Rush Meadows Dam and Remaining Abutments Associated with Partial Dam Removal ................................ 5-16

Figure 5-2. Cross Section of the Existing Agnew Dam and Remaining Abutments Associated with Partial Dam Removal ................................................ 5-17

Figure 5-3. Cross Section of the Existing Gem Dam and Modified Dam Associated with Gem Dam Retrofitting ................................................ 5-18

## List of Maps

Map 5-1. Preliminary FERC Boundary Modifications Under the Proposed Action ........................................................................................ 5-20

Map 5-2. Preliminary FERC Boundary Modifications Under the Proposed Action ........................................................................................ 5-21

Map 5-3. Preliminary FERC Boundary Modifications Under the Proposed Action ........................................................................................ 5-22

Map 5-4. Preliminary FERC Boundary Modifications Under the Proposed Action ........................................................................................ 5-23

## List of Appendices

Appendix 5-A Project Facility Modification Details

Appendix 5-B Construction Measures

Appendix 5-C Environmental Measures, Management, and Monitoring Plans

## List of Acronyms

| | |
|---|---|
| ac-ft | acre-feet |
| cfs | cubic feet per second |
| FERC | Federal Energy Regulatory Commission |
| PMF | probable maximum flood |
| Project | Rush Creek Project |
| SCE | Southern California Edison Company |
| USGS | United States Geological Survey |

# 5.0 PROPOSED ACTION

## 5.1 INTRODUCTION

This section describes the Proposed Action analyzed in this Application for New License. The Proposed Action represents Southern California Edison Company's (SCE) recommendations for continued operation and maintenance of the Rush Creek Project (Project), including disposition of Rush Meadows and Agnew dams and associated facilities; retrofitting of Gem Dam and continued operations; restoration activities; proposed measures to minimize construction effects; and environmental measures, management, and monitoring plans associated with continued operation and maintenance of the Project.

The Proposed Action considers input from state and federal resource agencies, Native American Tribes, non-governmental organizations, and members of the public acquired during extensive consultation activities completed for the relicensing of the Project (refer to Section 13, Consultation Documentation).

Using the No-Action Alternative described in Section 4 as a baseline, this section identifies changes that would occur to the Project under the Proposed Action. These include:

- Project facility modifications (Appendix 5-A)
- Changes to the existing Federal Energy Regulatory Commission (FERC) Project boundary
- Changes in Project operations
- Changes in Project maintenance
- New measures
    - Construction measures (Appendix 5-B)
    - Environmental measures, management, and monitoring plans associated with continued operation and maintenance of the Project (Appendix 5-C)

## 5.2 PROJECT FACILITY MODIFICATIONS

SCE's Proposed Action includes the following Project facility modifications:

- Partial removal of Agnew and Rush Meadows dams; and
- Retrofitting Gem Dam to facilitate continued operation of the Project for power generation.

Under the Proposed Action, hydroelectric operations at Rush Meadows and Agnew dams would be discontinued and these facilities (including associated ancillary support facilities) would be removed from the FERC license once all license conditions and regulatory requirements of FERC and other resource agencies are met. Gem Dam would be retrofitted to facilitate compliance with the seismic restrictions under a probable maximum flood (PMF) event with a new spillway and reduced dam height. Under the Proposed Action, hydroelectric operations at Gem Dam and Rush Creek Powerhouse would continue under FERC jurisdiction consistent with conditions identified in a new FERC license.

Project facility modification activities are summarized below and detailed information on construction and restoration activities is provided in Appendix 5-A. Refer to Table 5-1 for a list of existing Project facilities designated for removal or retention under the Proposed Action.

### 5.2.1 Rush Meadows Dam Removal

Under the Proposed Action, SCE would remove Rush Meadows Dam such that it no longer impounds water (dam abutments would remain). Modifications to Rush Meadows Dam include:

- Construction of a notch in the center of Rush Meadows Dam, sized to pass the PMF (approximately 6,500 cubic feet per second [cfs]), without water impoundment.
    - The notch would be approximately 140 feet wide at an elevation of +/-9,378 feet.
- Removal of the top 15 feet of the remaining dam sections.
- Reuse of the demolished concrete (approximately 2,300 cubic yards) as fill material with preliminary slopes of 1.5H:1V on the upstream and downstream sides of the remaining left and right sections of the dam to provide stabilizing support.
    - Minimal import of new fill materials or export of demolished concrete would be required.
- Development of a restoration plan that would be initiated the year following completion of dam removal construction activities.

Figure 5-1 shows the concept design for partial dam removal, subject to modifications in final design to reflect refined hydraulic calculations, topographic information, and structural engineering. Refer to Table 5-1 for a list of existing Project facilities designated for removal or retention at the Rush Meadows Dam area and Appendix 5-A for a description of construction and restoration activities.

### 5.2.2 Agnew Dam Removal

Under the Proposed Action, SCE would remove Agnew Dam such that it no longer impounds water (dam abutments would remain). Modifications to Agnew Dam include:

- Demolishing the center three arches of Agnew Dam to pass the PMF (approximately 8,400 cfs) without any water impoundment.
  - The new opening would be approximately 120 feet wide at an estimated water surface elevation of +/-8,474 feet.
- Reusing the demolished concrete (approximately 1,500 cubic yards) as fill material with preliminary slopes of 1.5H:1V on the inside of the remaining arches to provide stabilizing support.
- Development of a restoration plan that would be initiated the year following completion of dam removal construction activities.

Figure 5-2 shows the concept design for partial dam removal, subject to modifications in final design to reflect refined hydraulic calculations, topographic information, and structural engineering. Refer to Table 5-1 for a list of existing Project facilities designated for removal or retention at the Agnew Dam area and Appendix 5-A for a description of construction and restoration activities.

### 5.2.3 Gem Dam Retrofit

Under the Proposed Action, SCE would retrofit Gem Dam to meet seismic restrictions under a PMF event with a new spillway and reduced dam height. Retrofitting activities include:

- Removal of the upper portions of Arches No. 10 to No. 14 to develop a new ungated ogee spillway with a crest elevation corresponding to the top of the existing gravity infill section, elevation 9,027.5 feet (consistent with current seismic restrictions).
  - The spill capacity would be equal to or greater than the estimated PMF (8,700 cfs).
- Removal of approximately the top 22 feet of the remaining dam arches, Arches No. 1 to No. 9 and No. 15, leaving an estimated 1.5 feet of freeboard to prevent overtopping during a PMF event.
- Removal of approximately the downstream 10 feet of the vertical piers between Arches No. 1 to No. 9 to reduce concrete stresses in large seismic events.

- Use of the demolished concrete from construction as fill in Arches No. 1 to No. 7 and No. 9 to No. 14 to support the new spillway and remaining arches (Arch No. 8 is left unfilled due to the presence of the low-level outlet). No demolished concrete would be exported for disposal.

- Development of a restoration plan that would be initiated the year following completion of retrofitting construction activities.

Table 5-2 compares dam and reservoir characteristics under the original dam specifications (existing Project/seismic restrictions) and the proposed retrofitting project. Reservoir storage would be at the seismic restricted capacity of 10,752 acre-feet (ac-ft).

Figure 5-3 shows the concept design for dam retrofit, subject to minor modifications in final design to reflect refined hydraulic calculations, topographic information, and more detailed structural modeling and engineering. Refer to Table 5-1 for a list of existing Project facilities to be retained in the Gem Dam area and Appendix 5-A for a description of construction and restoration activities.

### 5.2.4 Restoration Plans

Under the Proposed Action, SCE will develop restoration plans to be implemented at Project reservoirs/dams the year following completion of construction activities. Conceptual restoration plans will be developed in collaboration with resource agencies following filing of the Draft License Application. Detailed restoration plans will be developed in collaboration with resource agencies following issuance of FERC's License Order. Conceptual restoration plans will include the following objectives:

#### 5.2.4.1 Rush Meadows Dam Project-Specific Restoration Activities

- Stabilization of areas upstream and downstream of the former dam site, as appropriate, to prevent erosion.

- Restoration of the Rush Meadows Dam work area, staging area, campsite, and areas where project-support facilities were removed.

- Revegetation and stabilization of sediment in the former lakebed, as necessary.

- Reestablishment/stabilization of Rush Creek with the lakebed, as necessary.

- Restoration of the channel, and riparian and wetland vegetation in the former Waugh lakebed.

#### 5.2.4.2 Agnew Dam Project-Specific Restoration Activities

- Stabilization of areas upstream and downstream of the former dam site, as appropriate, to prevent erosion.
- Restoration of the Agnew Dam work area, staging area, and areas where project-support facilities were removed (i.e., flowline).
- Revegetation and stabilization of sediment in the former lakebed, as necessary.
- Reestablishment/stabilization of Rush Creek with the lakebed, as necessary.

#### 5.2.4.3 Gem Dam Project-Specific Restoration Activities

- Restoration of the Gem Dam work area, staging area, and areas where project-support facilities were removed.
- Revegetation and stabilization of sediment in the former inundation zone, as necessary.
- Reestablishment/stabilization of Rush Creek within the former inundation zone, as necessary.

### 5.2.5 Construction Schedule

The construction schedule for each Project facility modification is contingent on issuance of a new license and associated license conditions for the Project. In general, construction activities would follow a phased approach over several years, as noted below:

- Phase 1: Development of Final Engineering Plans
- Phase 2: Permitting/Agency Coordination and Approval of the Engineering Design by FERC and California Division of Safety of Dams
- Phase 3: Implementation/Construction
- Phase 4: Restoration and Implementation of License Conditions

It is anticipated that partial removal of Rush Meadows and Agnew dams would require one construction season each and retrofitting of Gem Dam would require three construction seasons. The duration of construction may change based on final engineering design. The construction season would extend from approximately June 1 to October 31, depending on weather and snow conditions. Construction activities would be sequenced such that construction would only be happening at one site at a time.

A schedule for these construction-related activities will be provided to FERC within a year following license issuance. It is anticipated that Phase 1 would begin within two years following license issuance.

## 5.3 CHANGES TO THE EXISTING FERC PROJECT BOUNDARY

The Proposed Action includes changes to the existing FERC Project boundary to (1) correct known errors in the current boundary (i.e., technical corrections), and (2) remove lands that will no longer be necessary for operation and maintenance of the Project following implementation of Project facility modifications.

Technical corrections to the current boundary and associated acreage information will be included in the revised Exhibit G to be provided in the Final License Application.

Following implementation of Project facility modifications, SCE will file revised Exhibit G maps to formally remove lands from the FERC Project boundary that will no longer be necessary for operation and maintenance of the Project. These FERC Project boundary revisions, which SCE is requesting that FERC approve as part of this Application (and to become effective upon FERC's approval of a set of revised Exhibit G maps that SCE will file following completion of construction activities associated with Agnew and Rush Meadows), are depicted in Maps 5-1 through 5-4. Maps 5-1 through 5-4 are for reference only and any boundaries and acreage estimates are preliminary and subject to change according to further refinement of engineering design (refer to Exhibit G). The post-implementation Exhibit G submittal would include updated calculations of federal lands included within the new FERC Project boundary. Once FERC approves the revised Exhibit G maps, the Project boundary change would become effective.

## 5.4 CHANGES IN PROJECT OPERATIONS

Under the Proposed Action, hydroelectric operations at Rush Meadows and Agnew dams would be discontinued. Gem Dam would be retrofitted to operate at a reservoir elevation of 10,752 ac-ft (consistent with the current seismic restriction) and hydroelectric operations would continue at Gem Dam and Rush Creek Powerhouse.

Gem Lake operations would continue as they currently do under existing conditions. Specifically, Gem Lake would fill to 9,027.5 feet elevation and maintain storage through the summer. Most of the storage would be released in the fall and the reservoir would remain low until spring high flows refill it the following year. Releases from Gem Lake, not including spills, would either be diverted into Rush Creek Powerhouse or travel downstream in Rush Creek to Agnew Lake (natural lake).

Based on Project facility modifications to be implemented under the Proposed Action, SCE proposes the following changes to minimum instream flows, reservoir levels, and ramping rate requirements.

### 5.4.1 Minimum Instream Flow

Under the Proposed Action, minimum instream flow requirements below Rush Meadows and Agnew dams would be discontinued following removal of these facilities.

Minimum instream flow requirements below Gem Dam would include a continuous minimum flow of 1 cfs (or natural inflow[1] if the level of Gem Lake falls below the face of the dam) in Rush Creek below Gem Dam (United States Geological Survey [USGS] Gage 10287281; SCE 352 R) and 1 cfs (or natural inflow if the level of Gem Lake falls below the face of the dam) below Agnew Lake (natural lake) at the flume gage (USGS 10287289; SCE 357). SCE may temporarily modify minimum instream flows if required by operating emergencies beyond its control. SCE may also modify minimum instream flows for short periods upon written consent of the United States Forest Service.

### 5.4.2 Reservoir Levels at Gem Lake

Under the Proposed Action, reservoir level requirements at Waugh and Agnew lakes would be discontinued following removal of Rush Meadows and Agnew dams.

Following retrofitting of Gem Dam, Gem Lake would be operated during the July through Labor Day weekend season to meet the primary hydropower generation purpose of the reservoir and to maintain a storage space buffer in the lake to accommodate variable high and low inflows depending on the water year type. SCE would also support reservoir-based recreation by making every reasonable effort to achieve the following water surface objectives as determined by the April 1 snow water equivalent at Agnew Pass:

| April 1 Snow Water Equivalent Percent at Agnew Pass[1] | Gem Lake Elevation Objectives, Elevation from the Spillway (feet) | Date |
|---|---|---|
| >100% | 5 | August 1 through the Tuesday after Labor Day weekend |
| 75-100% | 5 | July 1 through the Tuesday after Labor Day weekend |
| 40-<75% | 10 | July 1 through the Tuesday after Labor Day weekend |
| <40% | 15 | July 1 through the Tuesday after Labor Day weekend |

Note:

[1] Agnew Pass snow water equivalent is located at site AGP – Agnew Pass on the California Data Exchange Center. In the event snow water equivalent data is not available at Agnew Pass, an alternate site such as GEM – Gem Pass may be used.

[1] Natural inflow if natural inflow is less than the specified minimum flow. The bottom of the dam face and low-level outlet pipe invert is approximately 8,983.88 feet elevation.

### 5.4.3 Ramping Rates

Under the Proposed Action, Rush Meadows and Agnew dams would be removed and the dams would no longer retain water. Following removal, there would be no annual drawdown or need for ramping rate requirements in Rush Creek at these locations.

Gem Dam would be retrofitted to operate at the current reduced seismic restriction level. The lake would store water in the spring / early summer and then release the stored water in the fall / winter for power generation, the same as operations under the No-Action Alternative. Annual lowering of the reservoir would be a function of flow releases into the Rush Creek Powerhouse and through minimum flow releases. The steady minimum instream flow releases in Rush Creek below Gem Dam (1 cfs) would not require ramping under the Proposed Action.

## 5.5 CHANGES IN PROJECT MAINTENANCE

Under the Proposed Action, routine inspection and maintenance activities would continue to be implemented at Gem Dam and Rush Creek Powerhouse as described in the No-Action Alternative (Section 4.5). At facilities proposed for removal (i.e., Rush Meadows and Agnew dams) routine inspection and maintenance activities would continue until construction activities are implemented. Following implementation of Project facility modifications, inspection and maintenance activities would be discontinued at Project facilities that are removed.

## 5.6 NEW MEASURES

### 5.6.1 Construction Measures

Under the Proposed Action, SCE will implement measures during construction of Project facility modifications, including best management practices, general construction measures, avoidance and protection measures, construction monitoring, and public outreach notifications. Appendix 5-B identifies these proposed construction measures. Following completion of site-specific engineering designs for each modification, SCE will review the measures with resource agencies for adequacy in protecting resources. If additional site-specific construction measures are necessary, or existing measures require modification, they will be developed in consultation with resource agencies and implemented as part of modification activities.

### 5.6.2 Environmental Measures

Proposed environmental measures, management, and monitoring plans to be implemented under the Proposed Action are listed below. The environmental measures, management, and monitoring plans are designed to protect, maintain, or enhance environmental and cultural resources over the term of the new license. Appendix 5-C provides additional information regarding each of these proposed measures.

- Aquatic Resources
  - Minimum Instream Flow Measure
  - Recreation Reservoir Elevation Objectives Measure
  - Stream and Reservoir Gaging Monitoring Plan
  - Fish Stocking Measure
- Cultural Resources
  - Historic Properties Management Plan
- Terrestrial Resources
  - Vegetation Management Measure

# TABLES

## Table 5-1. Proposed Project Facilities

| Proposed Project Facility | | Remove | Retain |
|---|---|---|---|
| **Rush Meadows Dam Area** | | | |
| Dam | Rush Meadows Dam | X | |
| Reservoir | Waugh Lake | X | |
| Valve House | Rush Meadows Dam Valve House | X | |
| Stream Gage | Rush Creek below Rush Meadows (Waugh Lake) (USGS No. 10287262; SCE No. 359r) | | X |
| Reservoir Gage | Waugh Lake (USGS No. 10287260; SCE No. 359) | X | |
| Trail | Rush Meadows Dam Access Trail | X | |
| Rush Meadows Dam/Waugh Lake Ancillary and Support Facilities | Rush Meadows Dam Equipment Shed | X | |
| | Rush Meadows Dam Gage House | X | |
| | Rush Meadows Dam Solar Facility | X | |
| **Gem Dam Area** | | | |
| Dam | Gem Dam | | X |
| Reservoir | Gem Lake | | X |
| Flowline | Gem Dam to Agnew Junction Flowline | | X |
| Valve House | Gem Valve House and Cabin | | X |
| | Gem Dam Arch 8 Valve House | | X |
| | Gem Flowline Valve House | | X |
| Stream Gage | Rush Creek below Gem Lake (USGS No. 10287281; SCE No. 352r) | | X |
| Reservoir Gage | Gem Lake (USGS No. 10287280; SCE No. 352) | | X |
| Communication Lines | Communication Line from Rush Creek Powerhouse to Gem Lake Dam | | X |
| | Communication Line from Gem Valve House to Arch 8 Valve House | | X |
| | Communication Line from Gem Tram Hoist House to Gem Valve House | | X |
| Trams and Hoist Houses | Gem Tram | | X |
| | Gem Tram Hoist House | | X |
| | Gem Tram Lower/Upper Landing | | X |
| Trails | Lower Gem Dam Access Trail | | X |
| | Gem Dam Arch 8 Access Trail | | X |
| | Upper Gem Dam Access Trail | | X |

| Proposed Project Facility | | Remove | Retain |
|---|---|---|---|
| Gem Dam/Lake Ancillary and Support Facilities | Gem Lake Dock | | X |
| | Gem Lake Motor Barge | | X |
| | Gem Bunkhouse | | X |
| | Gem Outhouse | | X |
| | Gem Cookhouse | | X |
| | Gem Dam Compressor Shed | | X |
| | Gem Dam Storage Shed | | X |
| | Gem Dam Overhead Hoist House for Dam Length | | X |
| | Gem Dam Overhead Hoist House | | X |
| | Gem Fish Release Footbridge | | X |
| | Gem Tram Landing Footbridge | | X |
| | Gem Tram Bridge | | X |
| | Gem Weather Station | | X |
| | Gem Satellite Dish | | X |
| | Gem Solar Facility | | X |
| | Gem Valve House Tunnel | | X |
| **Agnew Dam Area** | | | |
| Dam | Agnew Dam | X | |
| Reservoir/Natural Lake | Agnew Lake | | X (natural lake) |
| Flowline | Agnew Dam to Agnew Junction Flowline | X | |
| Valve House | Agnew Junction (Valve House and Stand Pipe) | | X |
| | Agnew Dam Valve House | X | |
| Stream Gage | Rush Creek below Agnew Lake (USGS No. 10287289; SCE No. 357) | | X |
| Reservoir Gage | Agnew Lake (USGS No. 10287285; SCE No. 351) | X | |
| Power Lines | 4-kV Agnew Distribution Line | | X |
| | 4-kV Agnew Dam Tap Line | X | |
| | 4-kV Upper Agnew Boat Dock Tap Line | | X |
| Communication Line | Communication Line from Agnew Hoist House to Agnew Boathouse | | X |
| Trams and Hoist Houses | Agnew Tram | | X |
| | Agnew Tram Hoist House | | X |
| | Agnew Tram Landing | | X |
| Trail | Agnew Stream Gage Access Trail | | X |
| Agnew Dam/Lake Ancillary and Support Facilities | Lower Agnew Lake Boathouse/Dock | | X |
| | Upper Agnew Lake Boathouse/Dock | | X |
| | Agnew Lake Motor Barge | | X |
| | Agnew Cabin | | X |
| | Agnew Weather Station | X | |
| | Agnew Flume (downstream of Agnew Dam) | | X |

| Proposed Project Facility | | Remove | Retain |
|---|---|---|---|
| **Rush Creek Powerhouse Area** | | | |
| Penstocks | Agnew Junction to Rush Creek Powerhouse Penstock (No. 1) | | X |
| | Agnew Junction to Rush Creek Powerhouse Penstock (No. 2) | | X |
| Powerhouse | Rush Creek Powerhouse | | X |
| Gage | Rush Creek Powerhouse (USGS No. 10287300; SCE No. 367) | | X |
| Power Line | 2.4-kV Switchyard to Powerhouse Distribution Line | | X |
| Powerhouse Ancillary and Support Facilities | Rush Creek Powerhouse Complex Access Road | | X |
| | Cottages (2) | | X |
| | Garages (4) | | X |
| | Warehouse and Dock | | X |
| | Machine Shop | | X |
| | Pump House | | X |
| | Woodsheds (2) | | X |
| | Helicopter Landing Site | | X |
| | Tank (propane) | | X |
| | Bridge over Powerhouse Tailrace | | X |
| | Bridge over Rush Creek | | X |

Key:

kV= kilovolt

SCE = Southern California Edison Company

USGS = United States Geological Survey

## Table 5-2. Gem Dam and Lake Specifications

| | Existing (Seismic Restriction) | Post Retrofit |
|---|---|---|
| **Dam** | | |
| Type | Multiple arch (16 complete; 2 partial) | No change |
| Material | Concrete | No change |
| Height (maximum) | 84 feet | 62 feet |
| Length | 688 feet | No change |
| Volume | 21,612 cubic yards | 21,612 cubic yards |
| Elevation of Dam Crest | 9,057.5 feet | 9,035 feet |
| **Spillway** | | |
| Type | Uncontrolled | No change |
| Upper Spillway Elevation | 9,053.64 feet | 9,027.5 feet |
| • Openings/Dimensions | 5 openings / 5 feet wide x 2 feet high | Wide, ungated, free overflow spillway in Arches No. 10 to No. 14 |
| Lower Spillway Elevation | 9,051.63 feet | Removed |
| • Openings/Dimensions | 8 openings / 5 feet wide x 2 feet high | Removed |
| Capacity (maximum) | 1,100 cubic feet per second | 8,700 cubic feet per second |
| **Reservoir** | | |
| Elevation at Maximum Operating Water Surface | 9,027.5 feet | 9,027.5 feet |
| Gross Storage | 10,752 acre-feet | 10,752 acre-feet |
| Area at Maximum Operating Water Surface | 256 acres | 256 acres |

# FIGURES

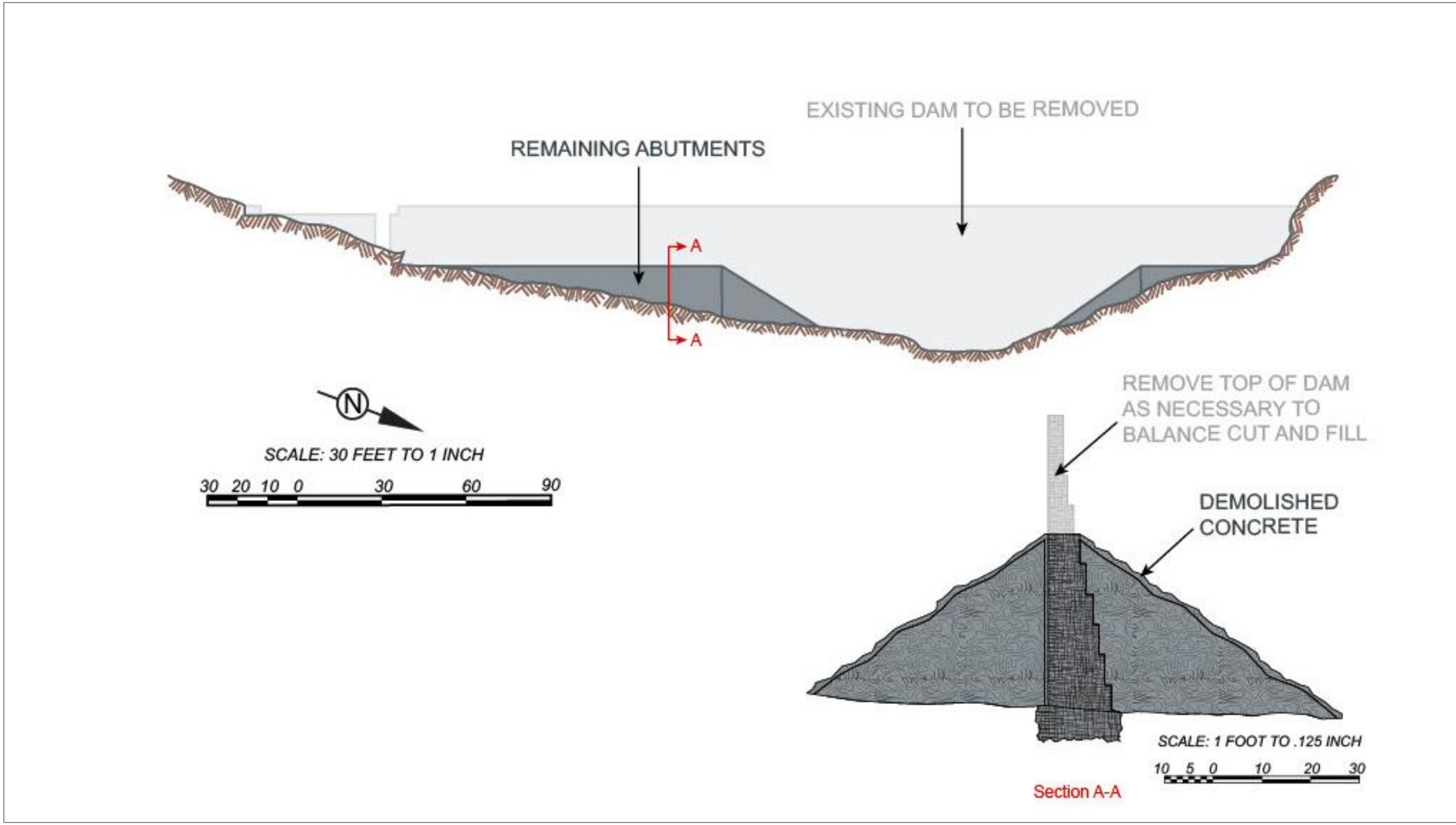



**Figure 5-1. Cross Section of the Existing Rush Meadows Dam and Remaining Abutments Associated with Partial Dam Removal**

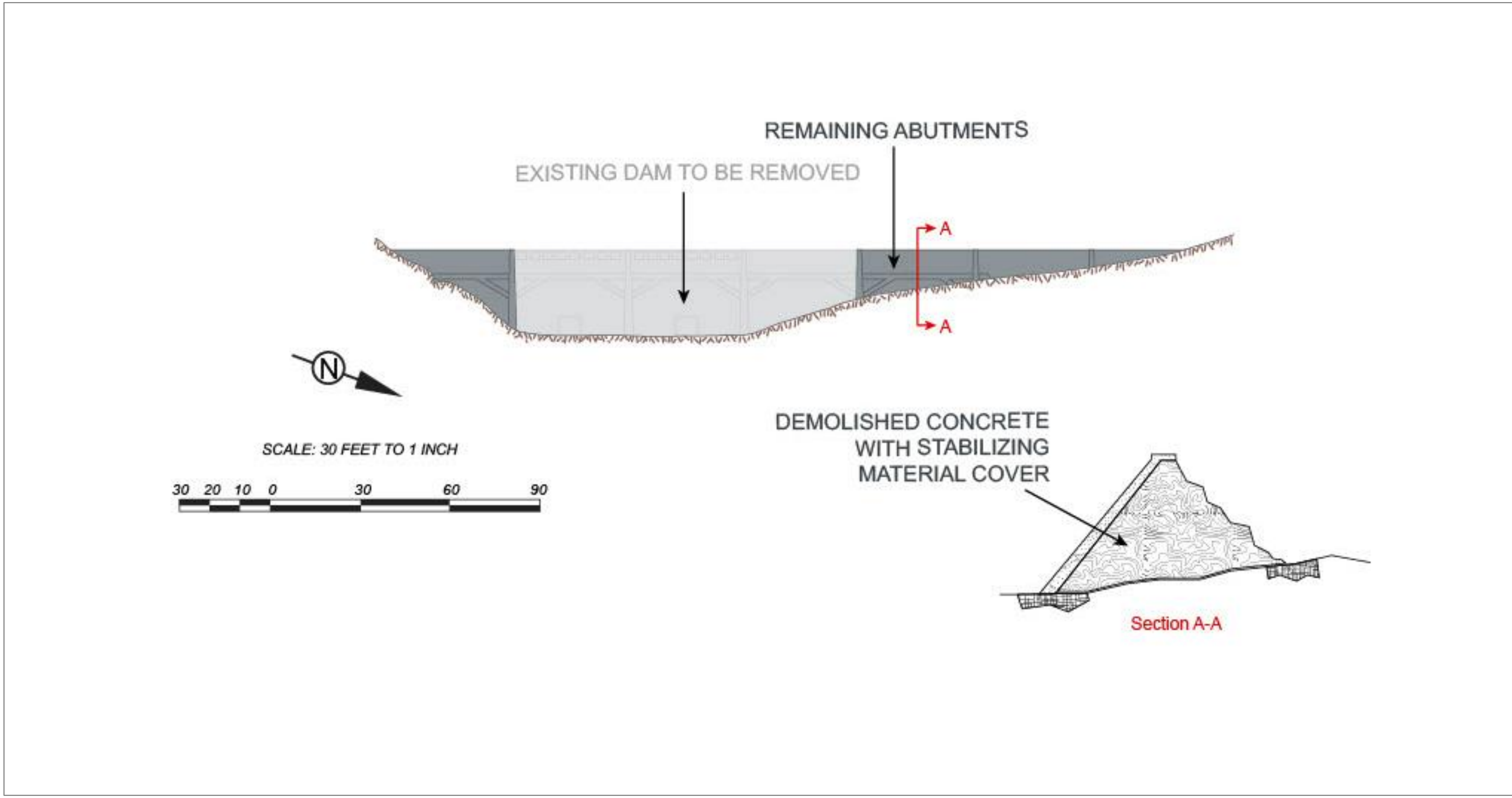



**Figure 5-2. Cross Section of the Existing Agnew Dam and Remaining Abutments Associated with Partial Dam Removal**

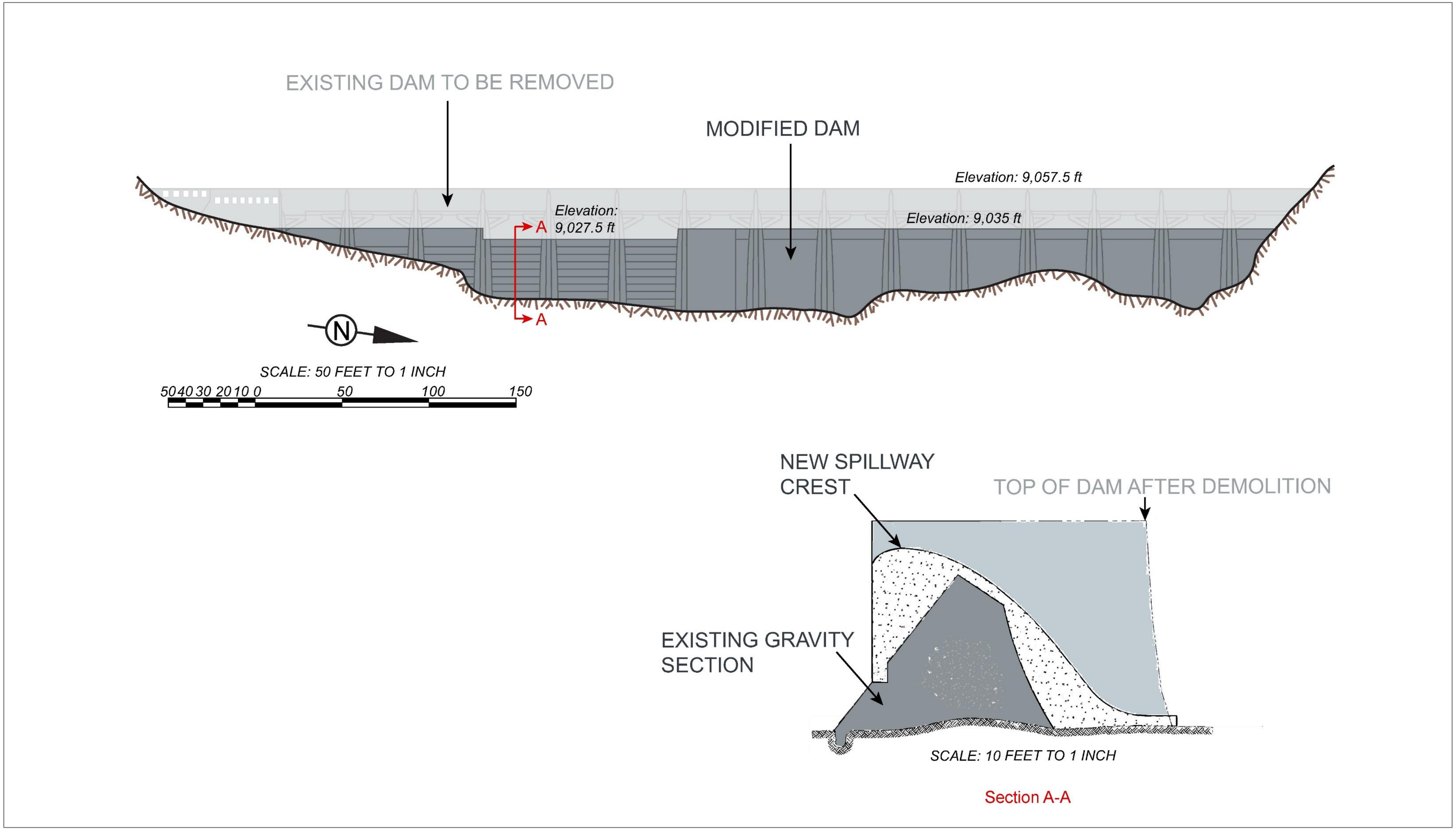
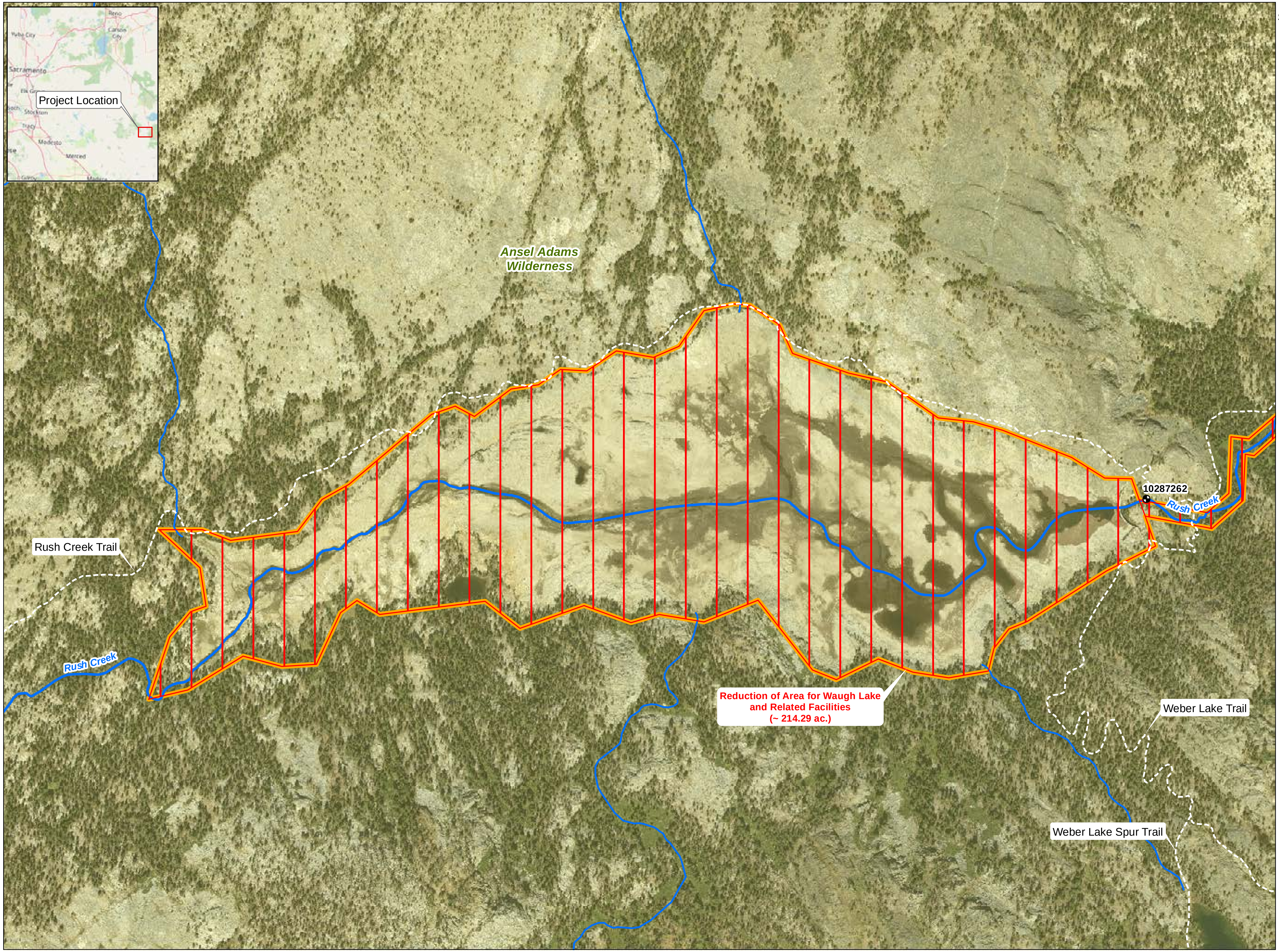



**Figure 5-3. Cross Section of the Existing Gem Dam and Modified Dam Associated with Gem Dam Retrofitting**

# MAPS




**SCE Facilities (Under Proposed Action)**

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

**Other Features**

- Watercourse
- Lake
- Non-Project Trail

**Land Management**

National Wilderness Area**

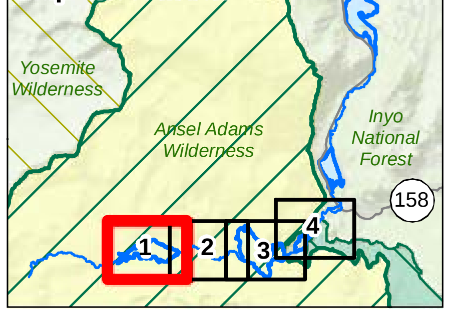
- Ansel Adams Wilderness
- Owens River Headwaters Wilderness

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

**Proposed FERC Boundary Modifications**

- Boundary Reduction

**Map Sheet Index**




SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead℠

Rush Creek Project (FERC 1389)

**Map 5-1**

**Preliminary FERC Boundary Modifications Under the Proposed Action**

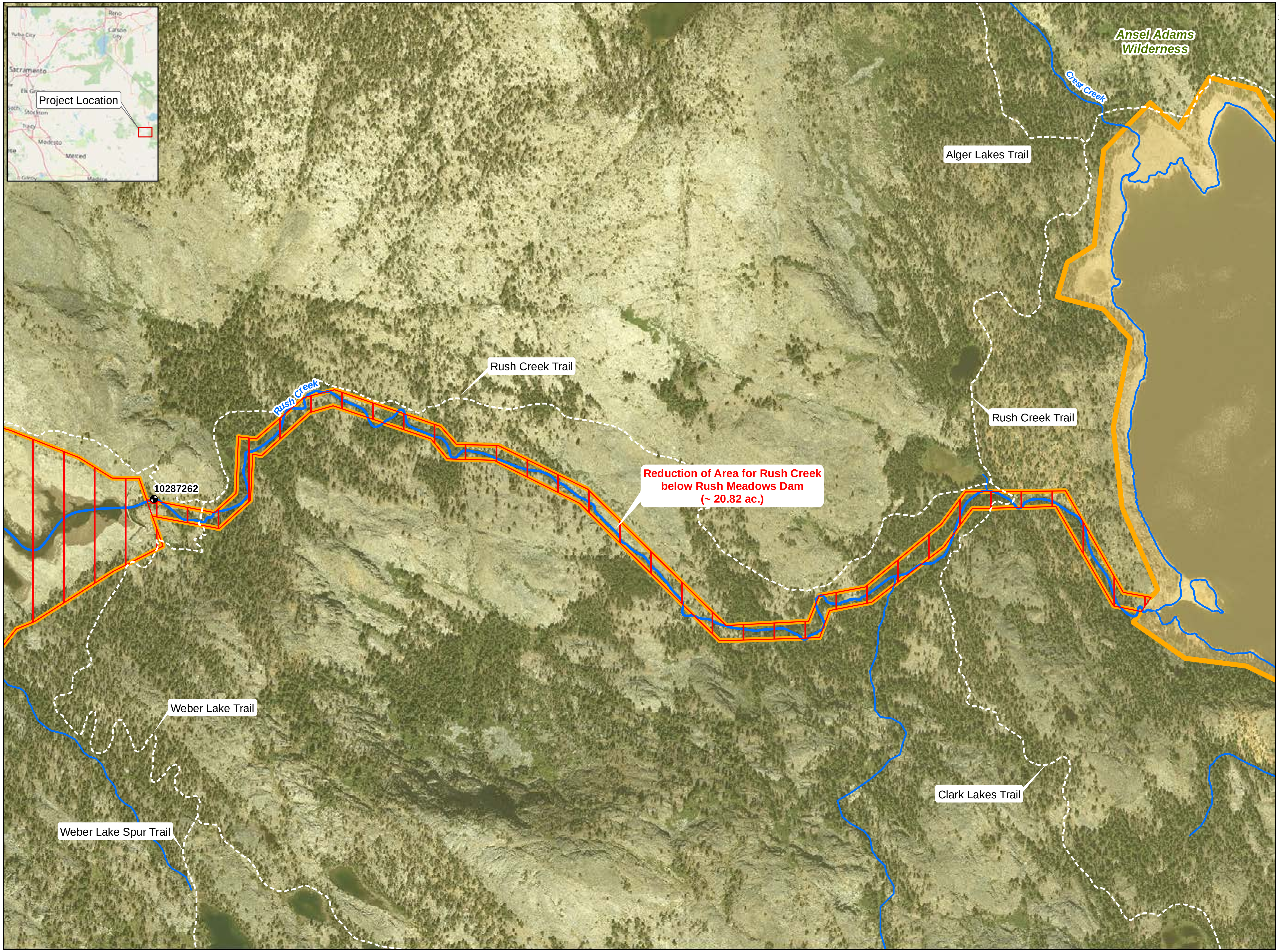
0 250 500 Feet

**Projection: UTM Zone 11**
**Datum: NAD 83**

**Date: 8/22/2024**



C:\GIS\237800343\map\Rush Creek\FERCBoundaryMaps\SCE_RUSH_CREEK_FERCBndy_PropActionMods_17i11i_12_RO.mxd




**SCE Facilities (Under Proposed Action)**

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

**Other Features**

- Watercourse
- Lake
- Non-Project Trail

**Land Management**

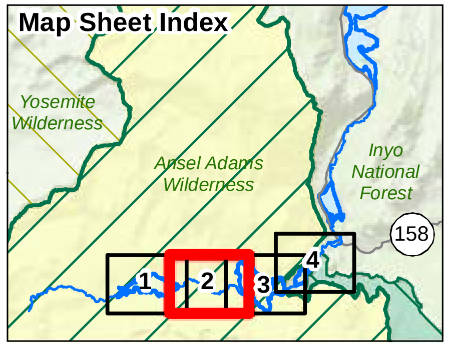
National Wilderness Area**

- Ansel Adams Wilderness
- Owens River Headwaters Wilderness

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

**Proposed FERC Boundary Modifications**

- Boundary Reduction




SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead℠

Rush Creek Project (FERC 1389)

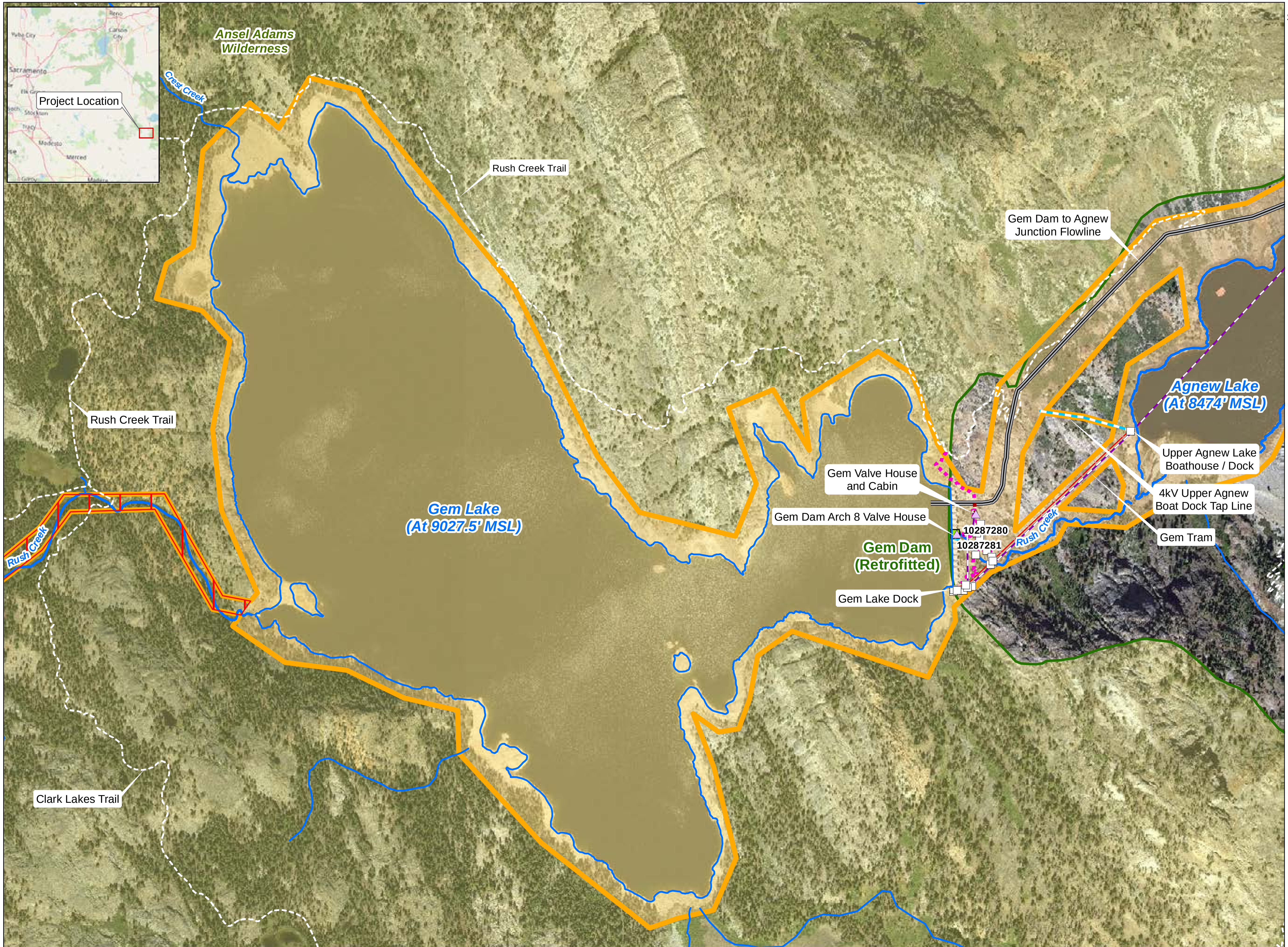
**Map 5-2**

**Preliminary FERC Boundary Modifications Under the Proposed Action**

Date: 8/22/2024

0 250 500 Feet

**Projection: UTM Zone 11**
**Datum: NAD 83**




**SCE Facilities (Under Proposed Action)**

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

**Other Features**

- Watercourse
- Lake
- Non-Project Trail

**Land Management**

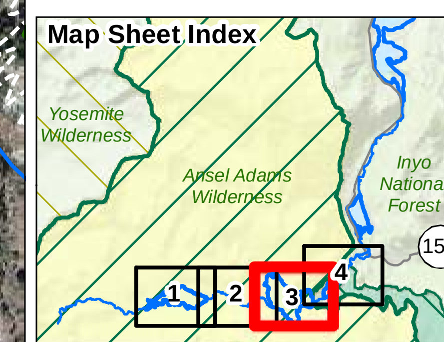
National Wilderness Area**

- Ansel Adams Wilderness
- Owens River Headwaters Wilderness

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

**Proposed FERC Boundary Modifications**

- Boundary Reduction




SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead℠

Rush Creek Project (FERC 1389)

**Map 5-3**

**Preliminary FERC Boundary Modifications Under the Proposed Action**

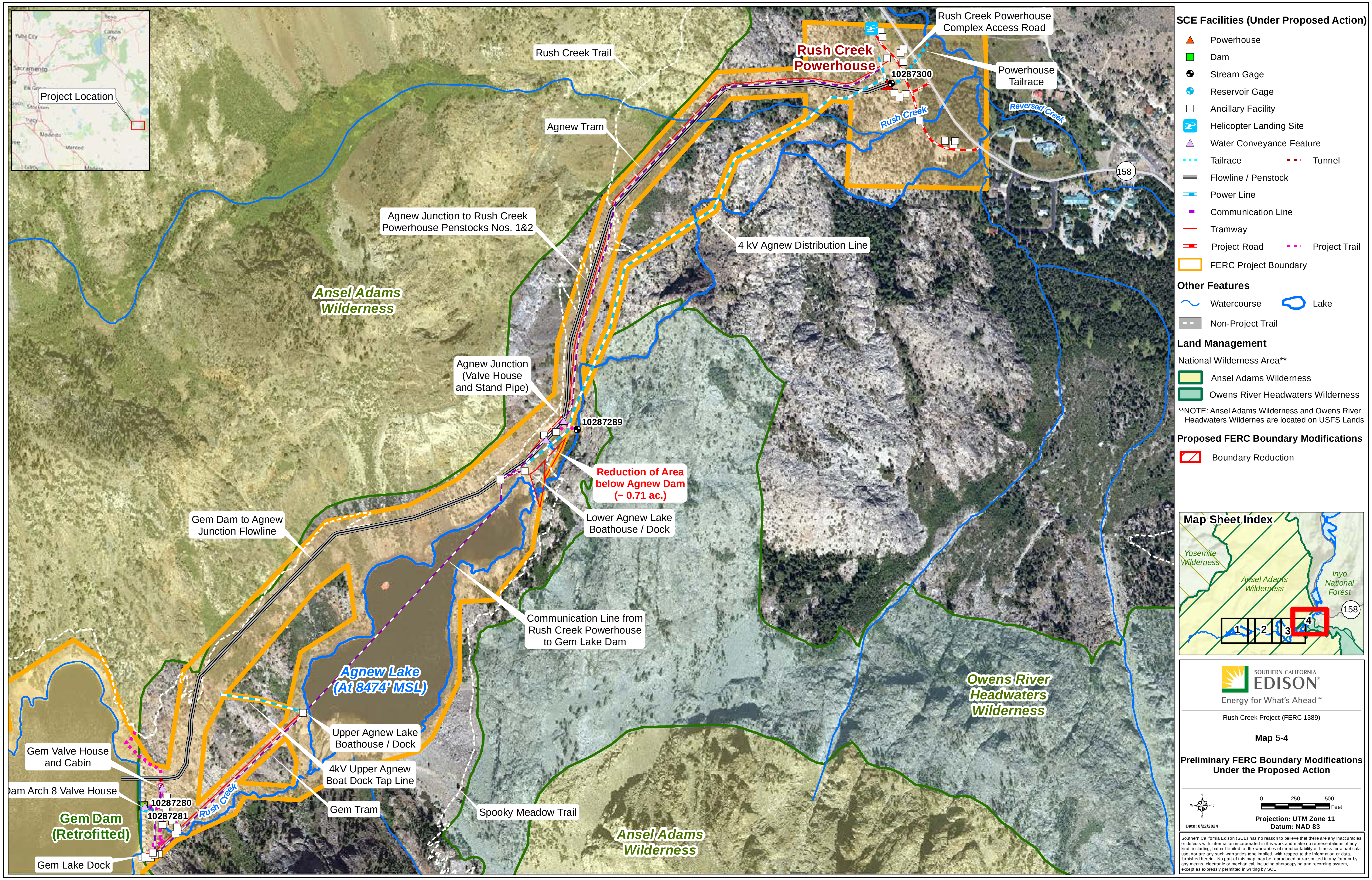
0 250 500 Feet

**Projection: UTM Zone 11**
**Datum: NAD 83**

**Date: 8/22/2024**



C:\GIS\237800343\map\Rush Creek\FERCBoundaryMaps\SCE_RUSH_CREEK_FERCBndy_PropActionMods_17i11i_12_RO.mxd




C:\GIS\237800343\map\Rush Creek\FERCBoundaryMaps\SCE_RUSH_CREEK_FERCBndy_PropActionMods_17i11i_12_RO.mxd

# APPENDIX 5-A

## Project Facility Modification Details

## TABLE OF CONTENTS

Page

**1.0 Project Facility Modification Details ........ 1**

1.1 Introduction ........ 1

1.2 Construction and Restoration Activities ........ 1

1.2.1 Activities Common Among Projects ........ 1

1.2.2 Project-Specific Approach for Partial Removal of Rush Meadows Dam ........ 10

1.2.3 Project-Specific Approach for Partial Removal of Agnew Dam ........ 15

1.2.4 Project-Specific Approach for Retrofitting of Gem Dam ........ 20

## LIST OF TABLES

Table A-1. Preliminary List of Construction Equipment at the June Mountain Ski Area Parking Lot ........ 27

Table A-2. Proposed Project Facilities ........ 28

Table A-3. Overview of Construction Activities Associated with Partial Removal of Rush Meadows Dam ........ 31

Table A-4. Estimated Helicopter and Truck Trips Associated with Partial Removal of Rush Meadows Dam by Construction Season and Month ........ 31

Table A-5. Preliminary List of Construction Equipment Associated with Partial Removal of Rush Meadows Dam ........ 32

Table A-6. Overview of Construction Activities Associated with Partial Removal of Agnew Dam ........ 33

Table A-7. Estimated Helicopter and Truck Trips Associated with Partial Removal of Agnew Dam by Construction Season and Month ........ 34

Table A-8. Preliminary List of Construction Equipment Associated with Partial Removal of Agnew Dam ........ 34

Table A-9. Gem Dam and Lake Specifications ........ 35

Table A-10. Overview of Construction Activities Associated with Gem Dam Retrofitting ........ 36

Table A-11. Estimated Helicopter and Truck Trips Associated with Gem Dam Retrofitting by Construction Season and Month ....................................... 36

Table A-12. Preliminary List of Construction Equipment Associated with Gem Dam Retrofitting ........................................................................................ 37

## LIST OF FIGURES

Figure A-1. Cross Section of the Existing Rush Meadows Dam and Remaining Abutments Associated with Partial Dam Removal .................................... 39

Figure A-2. Cross Section of the Existing Agnew Dam and Remaining Abutments Associated with Partial Dam Removal .................................... 40

Figure A-3. Cross Section of the Existing Gem Dam and Modified Dam Associated with Gem Dam Retrofitting .................................................... 41

## LIST OF MAPS

Map A-1. Location of Base of Operations, Flight Paths, and Recreation Trails ........................................................................................................ 43

Map A-2. Rush Meadows Dam Construction Area .................................................. 44

Map A-3. Agnew Dam Construction Area ................................................................ 45

Map A-4. Gem Dam Construction Area .................................................................... 46

## List of Acronyms

| | |
|---|---|
| BMP | best management practice |
| CFR | Code of Federal Regulations |
| cfs | cubic feet per second |
| FERC | Federal Energy Regulatory Commission |
| Forest Service | United States Forest Service |
| HDPE/PVC | high-density polyethylene/polyvinyl chloride |
| lb. | pound |
| PMF | probable maximum flood |
| Project | Rush Creek Project |
| RT | round trip |
| SCE | Southern California Edison Company |
| SR-158 | State Route 158 |
| SUP | Special Use Permit |
| US-395 | United States Route 395 |

# 1.0 PROJECT FACILITY MODIFICATION DETAILS

## 1.1 INTRODUCTION

This appendix provides details related to construction and restoration activities to be implemented under the Proposed Action described in Section 5.

Southern California Edison Company's (SCE) Proposed Action includes the following modifications to the Rush Creek Project (Project) (construction activities):

- Partial removal of Agnew and Rush Meadows dams; and
- Retrofitting Gem Dam to facilitate continued operation of the Project for power generation.

Under the Proposed Action, hydroelectric operations at Rush Meadows and Agnew dams would be discontinued and these facilities would be removed from the Federal Energy Regulatory Commission (FERC) license once all license conditions and regulatory requirements of FERC and other resource agencies are met. Gem Dam would be retrofitted to facilitate compliance with the seismic restrictions under a probable maximum flood (PMF) event with a new spillway and reduced dam height. Under the Proposed Action, hydroelectric operations at Gem Dam and Rush Creek Powerhouse would continue under FERC jurisdiction consistent with conditions identified in a new FERC license.

## 1.2 CONSTRUCTION AND RESTORATION ACTIVITIES

This section describes construction activities to be implemented at Rush Meadows, Agnew, and Gem dams. Each location is considered a discrete project, however, there are activities common to all projects, including (1) establishment of June Mountain Ski Area Parking Lot as the Base of Operations; (2) establishment of the construction area; (3) general construction activities; (4) disposition of other Project facilities; and (5) outreach activities. Common activities are described in Section 1.2.1.

Project-specific information on the construction area, worker housing, transport of personnel, construction activities, and restoration activities is discussed in detail for each project in Sections 1.2.2 through 1.2.4.

### 1.2.1 Activities Common Among Projects

#### 1.2.1.1 June Mountain Ski Area Parking Lot (Base of Operations)

Pending issuance of a Special Use Permit (SUP) from the United States Forest Service (Forest Service), the Base of Operations for all projects would be established at the June Mountain Ski Area Parking Lot (Map A-1), or other suitable location if identified later. The June Mountain Ski Area Parking Lot was selected as the Base of Operations for the following reasons: (1) its proximity to the construction sites, (2) it has appropriate access and space available, (3) it does not require any modification or upgrades, and (4) it has been successfully used by SCE to support previous Project maintenance activities. The following activities are associated with the Base of Operations.

The Base of Operations would be established at the beginning of each construction season and would include the following:

- Project Management Facilities, including
  - An office trailer powered by a generator (up to 25 kilowatts) would be installed for SCE project management and construction oversight personnel.
  - An office trailer powered by a generator (up to 25-kilowatt) would be installed for the contractor's construction personnel.
- Helicopter Landing Site
  - K-rail barriers would be used to control access to the helicopter landing site.
  - Helicopter fuel storage tanks and appropriate secondary containment and fire prevention/response equipment would be located adjacent to the landing site.
- Supporting Construction Equipment
  - Table A-1 provides a preliminary list of construction equipment that would be located at the Base of Operations.
- Staging Area
  - The staging area would be used to store construction equipment and materials.
  - Several storage containers would be used to secure smaller construction materials and equipment.
- Stockpile Area
  - The stockpile area would be used to temporarily store material removed from the construction sites prior to transport to an appropriate disposal site.
  - Specific locations within the stockpile area would be designated to temporarily store material based on its characteristics (i.e., hazardous/non-hazardous) and ultimate disposal location.
  - Debris boxes may be used to contain small waste material, as appropriate.

- Designated General Parking Area
  - The general parking area would be used by project managers, construction personnel, subcontractors, and other support personnel. Construction equipment would be parked at a designated location within the staging area.
- Sanitary Facilities
  - Sanitary facilities (i.e., port-a-johns) would be provided commensurate with the number of personnel using the site.
  - A local contractor would clean and maintain the sanitary facilities.
- Security
  - A security kiosk and entrance gate would be installed at the entrance to the Base of Operations.
  - Security personnel would be on-site 24 hours per day to control site access during the construction season.
- Fire Suppression Equipment
  - Fire prevention would be implemented consistent with a project-specific Fire Prevention/Protection Plan and would include, but is not limited to, staging of the following equipment at the Base of Operations to expeditiously extinguish any fire resulting from project activities:
    - Fire box with enough tools to outfit the average number of workers on the site;
    - Type 6 fire engines with minimum of 300 gallons of water; and
    - Water tender with at least 50 feet of hose and a nozzle.

**<u>Transport of Personnel, Equipment, and Material</u>**

The Base of Operations would function as the transportation hub for construction activities, including (1) arrival and departure of personnel to the job site; (2) receiving center for arrival and departure of construction equipment and material from the contractors and supply companies; (3) transport of equipment and material to/from the dam construction areas; and (4) receipt and loading of debris/material removed from the dam construction areas for transport to an appropriate disposal site. The following describes these transportation-related activities:

- Personnel, Equipment, and Material Access

  - The Base of Operations is located directly off State Route 158 (SR-158; also known as the June Lake Loop). Personnel would arrive/depart via SR-158 using either the northern or southern route of the loop road. SR-158 intersects United States Route 395 (US-395), the primary travel route into the region.

  - Construction equipment and vehicles hauling material would arrive/depart via SR-158 using the northern route of the loop road to avoid traffic through the community of June Lake.

- Construction Area Access

  - Specific information regarding access to the construction area from the Base of Operations is unique to each project and is provided in Sections 1.2.2 through 1.2.4. The following access to/from the construction areas is common to each project.

    - During mobilization and demobilization, heavy equipment would be transported to/from the construction areas using a Skycrane helicopter (lift capacity of approximately 11,000 pounds [lb.]).

    - During the construction season, equipment and material would be transported to/from the construction areas, as needed, using sling loads attached to either A-Star helicopter (lift capacity of approximately 2,500 lbs.), or modified Black Hawk helicopters (lift capacity of approximately 6,000 lbs.).

- Construction debris would be transported from the construction areas using sling loads attached to a helicopter to the Base of Operations for stockpiling prior to transport to an appropriate disposal site.

- Transport of Disposal Material

  - Transport of material (debris) from the Base of Operations to an appropriate disposal site that is common among projects consists of the following:

    - Non-hazardous construction debris stockpiled at the Base of Operations would be transported to the Pumice Valley Landfill or another disposal site on a daily/weekly basis. To travel to the Pumice Valley Landfill, haul trucks would leave the Base of Operations and travel east on SR-158 for approximately 12 miles to the northern intersection with US-395. The haul trucks would continue south on US-395 for approximately 0.5 mile, then east on Mono Lake Basin Road for approximately 2 miles, and then turn left onto Dross Road traveling 0.5 mile to the landfill.

    - Hazardous waste would be hauled by truck, consistent with state and federal regulations, for disposal at an appropriate hazardous waste disposal site (i.e., Ridgecrest, California; Los Angeles, California; or Beatty, Nevada).

  - California Department of Transportation and county authorizations would be obtained, as necessary, for road use.

- Transport of Personnel

  - Workers would be transported to/from the construction areas using the Agnew Tram (located near the Rush Creek Powerhouse) and/or using mules originating from the Frontier Pack Station (located near Silver Lake) via the Rush Creek Trail (Map A-1). Following completion of construction, the Rush Creek Trail would be restored to pre-construction conditions.

**Demobilization/Winterization**

Demobilization/winterization of the Base of Operations would be completed at the end of each construction season according to the following procedures:

- All construction equipment and materials, fuel tanks, trailers, sanitation facilities, secondary containment features, kiosks, signage, and K-rails would be removed from the site.

- The site would be restored to conditions that allow for winter ski operations consistent with requirements of the Forest Service SUP.

#### 1.2.1.2 Construction Area

For each project, a construction area would be established at the beginning of each construction season, including the following:

- Medical Kiosk

  - An emergency medical technician(s) and support equipment would be present in the construction area during construction hours.

- Work Area

  - Construction activities associated with the dam removal/retrofitting would occur within designated work areas located upstream and downstream of Project dams. All work, staging, and stockpile areas would be flagged prior to initiation of construction activities.

- Staging Areas
  - SCE would designate the following staging area(s) for each project:
    - A staging area located near the dam that may consist of:
      - One or more wood decks would be erected to provide a flat and stable surface for generators, compressors, fuel, spill prevention kits, and toolboxes. The decks would include secondary containment areas.
      - Diesel fuel tanks would be flown in, as needed, and stored in designated secondary containment areas.
      - Additional areas, as necessary, to store equipment and material.
    - A mule team staging area(s) located near the dam to facilitate transport of personnel, if appropriate.
  - The work area may also be used to stage equipment and material, as needed, during construction activities.
- Stockpile Areas
  - All hazardous material encountered during dam removal/retrofitting would be temporarily stockpiled within the construction/work area prior to transport off-site.
  - If appropriate, material from the disposition of Agnew Dam suitable for use in the retrofitting of Gem Dam would be stockpiled for future use within the construction/work area of Agnew Dam or Gem Dam outside the wilderness boundary.
  - All other material/debris would be temporarily stockpiled in designated areas prior to being transported off-site.
- Sanitation Facilities
  - Port-a-johns would be transported by helicopter to the construction area. The number of sanitation facilities would be commensurate with the number of personnel on-site. The port-a-johns would be replaced once per week. Secondary containment would be placed under the port-a-johns to contain any potential spills.

**Demobilization/Winterization**

Demobilization/winterization of the construction area would be completed at the end of each construction season according to the following general procedures:

- Remove the temporary cofferdam (super sacks/sandbags), dewatering pipes, and pumps (if present) from the active lakebed and transport to a staging area.
  - The super sacks and pipes would be covered, contained, and stored over the winter consistent with Forest Service guidance developed during the relicensing proceeding.
- Install temporary erosion control features in the construction area to stabilize soil, where necessary.
- Consolidate, cover, contain, and store construction and Best Management Practice (BMP) materials for the following year, as needed, at a staging area, consistent with Forest Service guidance to be developed during the relicensing proceeding.
- Winterize the work, staging, and stockpile areas in accordance with requirements of the project-specific Stormwater Pollution Prevention Plan.
- Use helicopters to remove all construction equipment, fuel tanks, sanitary facilities, and secondary containment features from the construction area and transport to the Base of Operations.
- Use mules to remove personnel equipment, supplies, and trash from the construction area.

#### 1.2.1.3 General Construction Activities

The following sections describe the general construction activities associated with dam removal/retrofitting that would be implemented for each project. A detailed description of site-specific construction activities associated with partial dam removal at Rush Meadows and Agnew dams is provided in Sections 1.2.2 and 1.2.3, respectively. Refer to Section 1.2.4 for a description of site-specific construction activities associated with Gem Dam retrofitting.

After establishment of the Base of Operations and construction area, the following construction activities would be implemented:

- Remove any hazardous material identified during on-site investigations completed during pre-construction activities, if applicable.
  - Hazardous material would be removed and contained consistent with federal and state regulations.

  - The material may be temporarily stockpiled on-site in a designated location prior to transport by helicopter to the designated hazardous waste stockpile area at the Base of Operations.

- Install a cofferdam and water bypass system to dewater the work area upstream of the dam, as appropriate.[1]

Excavate sediment to expose the face of the dam, as necessary, to complete dam removal/retrofitting.

- Excavation would be limited to locations with dry soils.
- Clean sediment would be stockpiled on-site for later use during restoration activities, as applicable.
- Remove/trim the geomembrane liner along the upstream face of the dam, as necessary, to complete dam removal/retrofitting.
- Complete project-specific construction activities associated with dam removal/ retrofitting using modern mechanical equipment.
- Transport material (debris) from the construction area to the Base of Operations.

#### 1.2.1.4 Disposition of Other Project Facilities

**Removal**

Concurrent with dam removal/retrofitting construction activities, existing Project facilities deemed unnecessary for continued operation and maintenance of the Project would be demolished and removed as follows:

- Temporary scaffolding may be erected to support demolition of buildings (e.g., removal of roofing).
- If present, concrete foundations/pads would be broken into manageable pieces using either pneumatic hand tools or a hoe ram mounted on a small excavator.
- All debris would be placed into bags and transported by helicopter with a sling load to the Base of Operations stockpile area.
- Debris would be transported to the Pumice Valley Landfill or another appropriate disposal site.

[1] Currently, the installation of cofferdam(s) is proposed at Rush Meadows Dam and Agnew Dam. Retrofitting of Gem Dam is proposed to be primarily conducted from a barge in a partially filled reservoir (see Section 1.2.4 for more detail).

**Retention**

Concurrent with dam removal/retrofitting construction activities, other Project facilities deemed necessary for continued operation and maintenance of the Project would be retained and rehabilitated, as appropriate. Refer to Table A-2 for a list of existing Project facilities designated for removal or retention associated with each project.

#### 1.2.1.5 Outreach Activities

The following outreach activities would be implemented for each project:

- Prior to initiation of construction SCE would:
  - Coordinate with the Forest Service and the National Park Service, as appropriate, regarding procedures for: (1) notifying the public regarding project activities; (2) issuing future wilderness permits to backcountry recreationists; and (3) evaluating/implementing trail closures and/or camping restrictions during construction.
    - Affected trails may include Rush Creek Trail, Clark Lakes Trail, Spooky Meadows Trail, and Weber Lake Trail (Map A-1). Trails may be closed for the duration of construction (June 1 to October 31)
    - The Rush Creek Trail terminates at its junction with the Pacific Crest Trail/John Muir Trail, which is located approximately 1.2 miles southwest of Rush Meadows Dam (Map A-1); therefore, notifications to hikers along the trail may be required.
    - Following determination of the need for trail or camping restrictions/closures, the Forest Service may issue a future Forest Order pursuant to 16 United States Code 551 and 36 Code of Federal Regulations (CFR) 261.50(a) and (b).
- Prior to initiation of construction SCE would:
  - Conduct a town hall meeting at June Lake to provide an overview of the upcoming project activities/schedule for residents, business owners, local government officials, sheriff’s department, resource agencies, Tribes, and members of the public. The meeting would provide an opportunity for stakeholders to ask questions and voice concerns.
- Prior to initiation of construction/restoration activities, SCE would:
  - Conduct a town hall meeting at June Lake (as described above).

  - Coordinate with the Forest Service and National Park Service regarding communicating any trail or area closures associated with the projects to the public, including:
    - Preparation of fliers, if necessary, for distribution at Forest Service visitor centers (e.g., Bishop, Mono Lake, Lone Pine, and Mammoth).
    - Posting of fliers, Forest Service Order(s), and associated maps at pertinent trailheads, Forest Service visitor centers (e.g., Bishop, Mono Lake, Lone Pine, and Mammoth), and the Forest Service website.
  - Coordinate with Forest Service air operations regarding helicopter flights and proposed flight paths.

### 1.2.2 Project-Specific Approach for Partial Removal of Rush Meadows Dam

Pursuant to 18 CFR § 5.18(b)(4), this section describes the project-specific approach for partial removal of Rush Meadows Dam, including:

- Construction of a notch in the center of the Rush Meadows Dam, sized to pass the PMF (approximately 6,500 cubic feet per second [cfs]), without water impoundment.
  - The notch would be approximately 140 feet wide at an elevation of 9,378 +/- feet.
- Removal of the top 15 feet of the remaining dam sections.
- Reuse of the demolished concrete (approximately 2,300 cubic yards) as fill material with preliminary slopes of 1.5H:1V on the upstream and downstream sides of the remaining left and right sections of the dam to provide stabilizing support.
  - Minimal import of new fill materials or export of demolished concrete would be required.

Figure A-1 shows the concept design for partial dam removal, subject to modifications in final design to reflect refined hydraulic calculations, topographic information, and structural engineering.

General construction activities that are common among projects are described in Section 1.2.1. The following section provides a detailed description of the construction area, transport of personnel, and project-specific construction activities.

#### 1.2.2.1 Rush Meadows Dam Construction Area

The construction area would encompass areas upstream and downstream of Rush Meadows Dam (Map A-2). The following project-specific information augments the general discussion of the establishment of the construction area and associated activities provided in Section 1.2.1. Each of these project-specific features/activities are described below:

- Construction Area
  - Construction activities would occur within a work area located upstream and downstream of Rush Meadows Dam.
  - Temporary bridges would be established adjacent to the dam to facilitate personnel and equipment transport across the Rush Creek channel, as appropriate.
- Staging Areas
  - One staging area would be established in the dry reservoir bed on the right bank near the dam (looking downstream) for construction storage, fuel storage, portable restrooms, construction offices, equipment staging, and laydown area.
  - Mule team staging areas would be located on the granite outcropping near Rush Creek Trail just south of the spillway and at the existing Frontier Pack Station Camp.
- Stockpile Areas
  - Hazardous materials would be stockpiled in the staging area located within the dry reservoir bed.
  - Material used to stabilize the abutments would be stockpiled within the work area downstream of the dam.
  - Material to be transported off-site would be stored at the debris stockpile area located within the staging area.
- Worker Housing Area
  - Worker housing would be established approximately 0.25 mile from Rush Meadows Dam at the existing Frontier Pack Station Camp (currently operated by Frontier Pack Station under an existing SUP issued by the Forest Service). The camp would be maintained consistent with all SUP conditions. The camp

would provide housing, kitchen facilities, and shower and restroom facilities for the workers.

- An alternative approach would be to provide worker housing on the right bank of the reservoir just upstream of the dam using pre-manufactured containers. On-site facilities have the advantage of a more contained construction site and more secure cover from severe weather events over the entirety of the construction season.

- Food, camping, personal supplies, and garbage would be transported primarily by pack mules and, when necessary, by helicopter. Food and garbage would be stored in bear-proof containers.

- Sanitary facilities (i.e., port-a-johns) would be transported by helicopter to the camp. The number of facilities would be commensurate with the number of personnel at the camp. The port-a-johns would be replaced once per week. Secondary containment would be placed under the port-a-johns to contain any potential spills.

- Shower stations would be established consistent with the Frontier Pack Station SUP. Showers would have warm water heated by 1- to 5-gallon refillable propane tanks. Similar shower units are currently in use by the Frontier Pack Station in the wilderness area.

- Following construction, the worker housing area facilities (including temporary housing and sanitation facilities) would be removed, and the site would be restored to pre-construction conditions.

#### 1.2.2.2 Rush Meadows Dam Transport of Personnel

Transport of personnel to/from the construction area (including the worker housing area) is described below.

- Tram Access

  - Workers would use the Agnew Tram[2] located near Rush Creek Powerhouse for transportation to/from Agnew Dam. They would then board a barge/boat to cross Agnew Lake (if reservoir levels allow) or walk the Rush Creek Trail to the Upper Agnew Lake Boat Dock where they would board the Gem Tram.[3] The Gem Tram terminates at Gem Dam. The workers would then travel on foot or by mule along Rush Creek Trail to/from the construction area/worker housing area.

[2] Agnew Tram will be repaired prior to dam retrofit/removal activities.

[3] Gem Tram was damaged during high flows in 2017 and a portion of the tram was washed out. Prior to dam retrofit/removal activities, the tram would be repaired.

- Mule Access
    - Workers may also be transported by mule between the Frontier Pack Station (located near Silver Lake) and the construction area via the Rush Creek Trail.

#### 1.2.2.3 Rush Meadows Dam Project-Specific Construction Activities

After establishment of the work, staging, stockpile, and worker housing areas, the following project-specific construction activities would be conducted. Refer to Section 1.2.1 for a description of general construction activities. This section also identifies the duration of construction, volume of material, and helicopter and truck trips.

**Construction Activities**

- Remove the geomembrane liner covering the upstream face of the dam and properly dispose of off-site.
- Install and operate the reservoir dewatering and bypass system:
    - In the late fall/winter prior to each construction season, the low-level outlets (one 24-inch circular outlet and one 30-inch square outlet at Rush Meadows Dam) would be fully opened to reduce impoundment of water in Waugh Lake.
    - If inflow during the runoff season exceeds the capacity of the low-level outlets, water would be impounded in the reservoir, potentially up to the bottom of the spillway.
    - Work in the reservoir and on the upstream side of the dam would be initiated only after the reservoir is drained and the entire volume of the inflow can be passed through the low-level outlet, allowing the reservoir bed to dry.
    - Once the water is at minimum pool at the invert elevation of the low-level outlet, high-density polyethylene/polyvinyl chloride (HDPE/PVC) piping would be inserted through the low-level outlet, extending approximately 100 to 200 feet upstream and downstream of the dam.
    - A small cofferdam consisting of super sacks and/or sandbags would be constructed at the upstream end of the pipe to direct water from the reservoir, past the work area (dam), to Rush Creek.
    - Small portable pumps may be placed between the cofferdam and Rush Meadows Dam to remove any water from low spots or capture leakage water to maintain a dry work area. The water would be pumped to a settling basin located in the dry lakebed. “Clean” water would then be pumped into the low-level outlet pipe.

- Construct temporary bridges over Rush Creek to provide full access upstream and downstream of the dam.

- Using modern equipment, a new opening at the base of the dam near the thalweg would be created to manage inflow and protect against job-site flooding.

- Dam demolition would be performed as follows:

  - Scaffolding and modern mechanical equipment would be used to cut sections of the concrete dam into small, manageable blocks using self-contained hydraulic wire saws powered by generators.[4]

  - A medium-sized excavator on the downstream side of the dam would load the debris into dump trucks (3-cubic-yard capacity).

  - The first material would be used to create access along the downstream side of the dam (the access route would be removed after project completion).

  - The remaining demolished concrete would be used as fill material with preliminary slopes of 1.5H:1V on the upstream and downstream sides of the remaining left and right abutments of the dam to provide stabilizing support.

- Minimal import of new fill materials or export of demolished concrete would be required.

## Construction Duration

The duration of construction for partial dam removal is one construction season. The duration of construction may change based on final engineering design. The construction season would extend annually from approximately June 1 to October 31, depending on weather and snow conditions. Construction activities would be implemented 10 hours per day, beginning no earlier than 7:00 a.m. (depending on activity and location), Monday through Saturday. A maximum of 8 to 12 workers would be at the construction area on each scheduled workday.

## Volume of Material, Helicopter Trips, and Truck Trips

Table A-3 provides an overview of construction activities associated with partial removal of Rush Meadows Dam. Table A-4 provides an estimate of helicopter and truck trips (round trips [RT]) by construction season and month. The total number of helicopter and truck trips may be modified following completion of engineering design and development of a detailed construction schedule.

[4] Slurry water generated by the cutting process would be vacuumed into double contained, sealed barrels and flown off-site for disposal.

**Construction Equipment**

Table A-5 provides a preliminary list of the type and quantity of construction equipment necessary to support partial dam removal (including other associated Project facilities) at the Base of Operations and the construction area. The final list of the type and quantity of construction equipment may be modified following completion of engineering design and development of a detailed construction schedule.

#### 1.2.2.4 Rush Meadows Dam Project-Specific Restoration Activities

Conceptual restoration plans will be developed in collaboration with resource agencies following filing of the Draft License Application. Detailed restoration plans will be developed in collaboration with resource agencies following issuance of FERC's License Order. Conceptual restoration plans will include the following objectives:

- Stabilization of areas upstream and downstream of the former dam site, as appropriate, to prevent erosion.
- Restoration of the Rush Meadows Dam work area, staging area, campsite, and areas where project-support facilities were removed.
- Revegetation and stabilization of sediment in the former lakebed, as necessary.
- Reestablishment/stabilization of Rush Creek with the lakebed, as necessary.
- Restoration of the channel, and riparian and wetland vegetation in the former Waugh lakebed.

Project-specific restoration activities will be initiated the year following completion of partial dam removal construction activities. Restoration activities would occur over a single season and would include implementation of measures to protect environmental and cultural resources potentially present. Following implementation of the restoration plan, a 5-year monitoring period would be implemented to evaluate the success of the restoration effort. If it is determined that the restoration does not meet the established success criteria (included in the restoration plan), SCE will modify and implement additional restoration actions, developed in consultation with resource agencies, to improve restoration success to meet the criteria.

### 1.2.3 Project-Specific Approach for Partial Removal of Agnew Dam

Pursuant to 18 CFR § 5.18(b)(4), this section describes the project-specific approach for partial removal of Agnew Dam, including:

- Demolishing the center three arches of Agnew Dam to pass the PMF (approximately 8,400 cfs) without any water impoundment.
  - The new opening would be approximately 120 feet wide at an estimated water surface elevation of 8,474 +/- feet.

- Reusing the demolished concrete (approximately 1,500 cubic yards) as fill material with preliminary slopes of 1.5H:1V on the inside of the remaining arches to provide stabilizing support.

Figure A-2 shows the concept design for partial dam removal, subject to modifications in final design to reflect refined hydraulic calculations, topographic information, and structural engineering.

General construction activities that are common among projects are described in Section 1.2.1. The following section provides a detailed description of the construction area, transport of personnel, and project-specific construction activities.

#### 1.2.3.1 Agnew Dam Construction Area

The construction area would encompass areas adjacent to Agnew Dam (Map A-3). The following detailed project-specific information augments the general discussion for establishment of the construction area and associated activities provided in Section 1.2.1. Each of these project-specific features/activities are described below:

- Construction Area
  - Construction activities would occur within a work area located upstream and downstream of Agnew Dam.
  - Temporary bridge(s) would be established adjacent to the dam to facilitate personnel and equipment transport across the reservoir and downstream channel, as appropriate. A temporary bridge over Rush Creek downstream of the dam would be installed to provide access along the full length of the dam during the construction period.
- Staging Areas
  - Two staging areas would be established in the dry reservoir bed (elevation 8,474 feet) on the left and right bank near the dam for construction storage, fuel storage, portable restrooms, construction offices, equipment staging, and laydown areas.
- Stockpile Areas
  - Hazardous materials would be stockpiled in the staging areas located within the dry reservoir bed upstream of the dam.
  - Material used to stabilize the remaining abutments would be stockpiled within the work area downstream of the dam.
  - Material to be transported off-site would be stored at the debris stockpile area located within the staging areas.

- Worker Housing Area
  - The existing Agnew Cabin downstream of the dam would be used to accommodate up to two people and provide kitchen and bathroom facilities and/or emergency shelter for workers.
  - Primary worker housing would be located at hotels in the vicinity of the Project.
  - Food, personal supplies, and garbage would be transported primarily via the tram and/or pack mules. Food and garbage would be stored in bear-proof containers.
  - Sanitary facilities (i.e., port-a-johns) would be transported by helicopter to the construction site. The number of facilities would be commensurate with the number of personnel on-site. The port-a-johns would be replaced once per week. Secondary containment would be placed under the port-a-johns to contain any potential spills.
  - Following construction, the worker housing area facilities (including temporary housing and sanitation facilities) would be removed, and the site would be restored to pre-construction conditions.
- Helicopter Landing Site
  - A temporary helicopter landing site would be established in the staging area upstream of Agnew Dam (Map A-3).

#### 1.2.3.2 Agnew Dam Transport of Personnel

Workers would be transported to/from the construction area using the Agnew Tram (located near the Rush Creek Powerhouse) and/or using mules originating from the Frontier Pack Station (located near Silver Lake) via the Rush Creek Trail (Map A-3).

#### 1.2.3.3 Agnew Dam Project-Specific Construction Activities

After establishment of the work, staging, and stockpile areas, the following project-specific construction activities would be conducted. Refer to Section 1.2.1 for a description of general construction activities. This section also identifies the duration of construction, volume of material, and helicopter and truck trips.

**<u>Construction Activities</u>**

- Remove the geomembrane liner covering the upstream face of the dam and properly dispose of off-site.

- Reduce water levels in the reservoir to the elevation of the natural lake:
  - In the late fall/winter/spring prior to the construction season, the 30-inch low-level outlet would be fully opened to manage water levels in Agnew Lake.
  - If inflow during the runoff season exceeds the capacity of the low-level outlet, water would be impounded in the reservoir, potentially up to the bottom of the notches in Arches No. 5 and No. 6.
  - Work in the reservoir and on the upstream side of the dam would only be initiated once the reservoir is drained and the entire volume of the inflow can be passed through the low-level outlet, allowing the reservoir bed to dry.
  - Inflow to Agnew Lake would be managed using storage in Gem Lake and controlling outflow from Gem Dam.
- Install cofferdam and water bypass system:
  - Once water is at minimum pool at the invert elevation of the low-level outlet, HDPE/PVC piping would be inserted through the low-level outlet and extend to the upstream cofferdam.
  - A cofferdam consisting of super sacks and/or sandbags would be constructed at the upstream end of the pipe to direct clean water from the reservoir, past the construction area (dam).
  - Small portable pumps may be placed between the cofferdam and Agnew Dam to remove any water from low spots or capture leakage water to maintain a dry work area. The water would be pumped to a settling basin located in the dry lakebed. "Clean" water would then be pumped into the low-level outlet pipe.
- Temporary bridge(s) would be constructed over Rush Creek to provide access to both sides of the dam.
- Dam demolition would be performed as follows:
  - Scaffolding and modern mechanical equipment would be used to remove Arches No. 4 to No. 6 from the dry reservoir bed. The concrete dam would be cut into small, manageable blocks using self-contained hydraulic wire saws powered by generators.[4]
  - A medium-sized excavator on the downstream side of the dam would load the debris into dump trucks (3-cubic-yard capacity).

- The first material would be used to create access along the downstream side of the dam (the access route would be removed after project completion).
- The remaining demolished concrete would be used as fill material with preliminary slopes of 1.5H:1V on the upstream and downstream sides of the remaining left and right abutments of the dam to provide stabilizing support.

- Minimal import of new fill materials or export of demolished concrete would be required.

**Flowline Removal Activities**

Concurrent with dam removal construction activities, the Agnew Dam Flowline would be removed from service as follows:

- Above ground sections of the flowline would be cut into manageable pieces and transported to the Base of Operations using helicopters.
- Underground sections of the flowline would remain in place with any exposed opening capped in concrete.
- Anchor blocks would be demolished similar to a building foundation and the gabion baskets would be disassembled.
- All debris would be placed into bags and flown out by helicopter via sling load to the Base of Operations stockpile area.
- The area would be backfilled, returned to its natural grade, and stabilized to prevent erosion.

**Construction Duration**

The duration of construction for partial dam removal is one construction season. The duration of construction may change based on final engineering design. The construction season would extend annually from approximately June 1 to October 31, depending on weather and snow conditions. Construction activities would be implemented 10 hours per day, beginning no earlier than 7:00 a.m., Monday through Saturday. A maximum of 8 to 12 workers would be at the construction area on each scheduled workday.

**Volume of Material, Helicopter Trips, and Truck Trips**

Table A-6 provides an overview of construction activities associated with partial removal of Agnew Dam. Table A-7 provides an estimate of helicopter and truck trips (RT) by construction season and month. The total number of helicopter and truck trips may be modified following completion of engineering design and development of a detailed construction schedule.

**Construction Equipment**

Table A-8 provides a preliminary list of the type and quantity of construction equipment necessary to support partial dam removal (including other associated Project facilities) at the Base of Operations and the construction area. The final list of the type and quantity of construction equipment may be modified following completion of engineering design and development of a detailed construction schedule.

#### 1.2.3.4 Agnew Dam Project-Specific Restoration Activities

Conceptual restoration plans will be developed in collaboration with resource agencies following filing of the Draft License Application. Detailed restoration plans will be developed in collaboration with resource agencies following issuance of FERC's License Order. Conceptual restoration plans will include the following objectives:

- Stabilization of areas upstream and downstream of the former dam site, as appropriate, to prevent erosion.
- Restoration of the Agnew Dam work area, staging area, and areas where project-support facilities were removed (i.e., flowline).
- Revegetation and stabilization of sediment in the former lakebed, as necessary.
- Reestablishment/stabilization of Rush Creek with the lakebed, as necessary.

Project-specific restoration activities will be initiated the year following completion of partial dam removal construction activities. Restoration activities would occur over a single season and would include implementation of measures to protect environmental and cultural resources potentially present. Following implementation of the restoration plan, a 5-year monitoring period would be implemented to evaluate the success of the restoration effort. If it is determined that the restoration does not meet the established success criteria (included in the restoration plan), SCE will modify and implement additional restoration actions, developed in consultation with resource agencies, to improve restoration success to meet the criteria.

### 1.2.4 Project-Specific Approach for Retrofitting of Gem Dam

Pursuant to 18 CFR § 5.18(b)(4), this section describes the project-specific approach for retrofitting of Gem Dam. SCE is not considering fully retrofitting Gem Dam to its original specifications and storage capacity. The retrofitting approach for Gem Dam evaluated in this license application includes the following:

- Retrofitting of Gem Dam to meet the following goals:
  - Ensure structural performance/integrity—minimal damage during and after a large magnitude earthquake (>5,000-year event), such that no repair is expected to be required.

  - Maintain hydraulic performance—spillway capacity capable of passing the PMF discharge without overtopping the dam.

- Removal of the upper portions of Arches No. 10 to No. 14 to develop a new ungated ogee spillway with a crest elevation corresponding to the top of the existing gravity infill section, elevation 9,027.5 feet (consistent with current seismic restrictions).

  - The spill capacity would be equal to or greater than the estimated PMF (8,700 cfs).

  - Removal of approximately the top 22 feet of the remaining dam arches, Arches No. 1 to No. 9 and No. 15, leaving an estimated 1.5 feet of freeboard to prevent overtopping during a PMF event.

- Removal of approximately the downstream 10 feet of the vertical piers between Arches No. 1 to No. 9 to reduce concrete stresses in large seismic events.

- Use of the demolished concrete from construction as fill in Arches No. 1 to No. 7 and No. 9 to No. 14 to support the new spillway and remaining arches (Arch No. 8 is left unfilled due to the presence of the low-level outlet). No demolished concrete will be exported for disposal.

Table A-9 compares dam and reservoir characteristics under the original dam specification (existing Project/seismic restrictions) and proposed retrofitting project. Reservoir storage would be at the seismic restricted capacity of 10,752 acre-feet.

Figure A-3 shows the concept design for dam retrofit, subject to minor modifications in final design to reflect refined hydraulic calculations, topographic information, and more detailed structural modeling and engineering.

General construction activities that are common among projects are described in Section 1.2.1. The following section provides a detailed description of the construction area, transport of personnel, and project-specific construction activities.

#### 1.2.4.1 Gem Dam Construction Area

The construction area would encompass areas located upstream and downstream of Gem Dam (Map A-4). The following detailed project-specific information augments the general discussion of the establishment of the construction area and associated activities provided in Section 1.2.1. Each of these project-specific features/activities are described below:

- Construction Area

  - Construction activities would occur within a work area located adjacent to the dam.

  - A temporary bridge would be established downstream of the dam to facilitate personnel and equipment transport across the stream channel during dam removal activities.

- Staging Areas

  - Staging area would be established in the dry reservoir bed for construction storage, fuel storage, portable restrooms, construction offices, equipment staging, and temporary docking facilities for the barge (Map A-4).

- Stockpile Areas

  - Hazardous materials would be stockpiled in the staging area located within the dry reservoir bed upstream of the dam.

  - Material used in retrofitting Gem Dam would be stockpiled within the work area downstream of the dam.

  - Material to be transported off-site would be stored at the debris stockpile area located in the staging area.

- Worker Housing Area

  - Worker housing would be established at: (1) the existing Gem Bunkhouse (to be renovated prior to construction; capacity 12 to 15 workers); (2) the existing Gem Valve House and Cabin (capacity of 6 workers); and (3) Agnew Cabin, if necessary (capacity of 2 workers). Additional housing units would be established near the construction area, if necessary.

  - The existing Gem Cookhouse would be used to provide meals to the crew (to be renovated prior to construction). The existing kitchen facilities are expected to be adequate, but an additional kitchen container unit may be provided near the construction area, if needed.

  - Food, camping, personal supplies, and garbage would be transported primarily by pack mules and/or tram. Food and garbage would be stored in bear-proof containers.

  - Additional sanitary facilities (i.e., port-a-johns) would be transported by helicopter to the construction area. The number of facilities would be commensurate with the number of personnel on the job site. The port-a-johns would be replaced once per week. Secondary containment would be placed under the port-a-johns to contain any potential spills.

  - A mule staging area would be established near the construction area.
  - Following construction, the worker housing area facilities (including temporary housing and sanitation facilities) would be removed, and the site would be restored to pre-construction conditions.

#### 1.2.4.2 Gem Dam Transport of Personnel

Transport of personnel to/from the construction area is described below.

- Tram Access
  - Workers would use the Agnew Tram located near Rush Creek Powerhouse for transportation to/from Agnew Dam.[5] They would then board a barge/boat to cross Agnew Lake (if reservoir levels allow) or walk the Rush Creek Trail to the Upper Agnew Lake Boat Dock where they would board the Gem Tram.[6] The Gem Tram terminates at Gem Dam.
- Mule Access
  - Workers may also be transported by mule between the Frontier Pack Station (located near Silver Lake) and the construction area via the Rush Creek Trail.

#### 1.2.4.3 Gem Dam Project-Specific Construction Activities

After establishment of the work, staging, and stockpile areas, the following project-specific construction activities would be conducted. Refer to Section 1.2.1 for a description of general construction activities. This section also identifies the duration of construction, volume of material, and helicopter and truck trips.

**<u>Construction Activities</u>**

- Construction/retrofitting activities would occur primarily from upstream of the dam using a floating barge in a drawn-down reservoir with implementation of appropriate BMPs.
- The reservoir would be drawn down to an elevation of approximately 9,000 feet.
  - The reservoir water level during construction would be adjusted by controlling releases from the 36-inch dam low-level outlet, 36-inch bypass valve, and power tunnel intake (48-inch pipe) at Gem Lake Dam and by adjusting Waugh Lake storage and outflow from Rush Meadows Dam.

[5] Agnew Tram will be repaired prior to dam retrofit/removal activities.

[6] Gem Tram was damaged during high flows in 2017 and a portion of the tram was washed out. Prior to dam retrofit/removal activities, the tram will be repaired.

- A floating barge equipped with a large excavator would be used to access the face of the dam for removal/adjustment of the existing geomembrane liner[7] and for modification/retrofitting of the dam.
  - Construction would be completed using access primarily from the reservoir side to minimize the potential for large pieces of demolished concrete material to fall into the drawn-down reservoir.
  - A catchment system along the upstream edge of the dam would be used to capture material before it enters the reservoir.
- The demolished concrete from construction of the new spillway, lowering of the remaining dam arches, and trimming of the vertical piers (approximately 10,200 cubic yards) would be used as infill to Arches No. 10 to No. 14 to support the downstream chute of the new spillway.[8] Recycled material available from Agnew Dam would also be used as infill to Arches No. 10 to No. 14.
  - The demolished concrete fill in Arches No. 10 to No. 14 would be compacted to a stable slope of approximately 1.5H:1V with a top layer of new reinforced concrete that would protect the fill material from scour and erosion during spill.
  - The concrete layer is expected to be formed into steps to improve energy dissipation of spill flow.

**Construction Duration**

The duration of construction associated with retrofitting Gem Dam is three construction seasons. The duration of construction may change based on final engineering design. The construction season would extend annually from approximately June 1 to October 31, depending on weather and snow conditions. Construction activities would be implemented 10 hours per day, beginning no earlier than 7:00 a.m., Monday through Saturday. A maximum of 12 to 18 workers would be at the construction area on each scheduled workday.

**Volume of Material, Helicopter Trips, and Truck Trips**

Table A-10 provides an overview of construction activities associated with retrofitting Gem Dam. Table A-11 provides an estimate of helicopter and truck trips (RT) by construction season and month. The total number of helicopter and truck trips may be modified following completion of engineering design and development of a detailed construction schedule.

[7] The existing geomembrane liner covering the upstream face of the dam would be modified during construction to accommodate the new dam face shape.

[8] A small portion of the demolished material would initially be used as base material for a construction access route along the rough rock surface downstream of the dam. This material would be removed near the end of construction and used as infill to Arches No. 10 to No. 14 to support the downstream chute of the new spillway.

**Construction Equipment**

Table A-12 provides a preliminary list of the type and quantity of construction equipment necessary for retrofitting Gem Dam. The final list of the type and quantity of construction equipment may be modified following completion of engineering design and development of a detailed construction schedule.

### 1.2.4.4 Gem Dam Project-Specific Restoration Activities

Conceptual restoration plans will be developed in collaboration with resource agencies following filing of the Draft License Application. Detailed restoration plans will be developed in collaboration with resource agencies following issuance of FERC's License Order. Conceptual restoration plans will include the following objectives:

- Restoration of the Gem Dam work area, staging area, and areas where project-support facilities were removed.
- Revegetation and stabilization of sediment in the former inundation zone, as necessary.
- Reestablishment/stabilization of Rush Creek within the former inundation zone, as necessary.

Project-specific restoration activities will be initiated the year following completion of retrofitting construction activities. Restoration activities would occur over a single season and would include implementation of measures to protect environmental and cultural resources potentially present. Following implementation of the restoration plan, a 5-year monitoring period would be implemented to evaluate the success of the restoration effort. If it is determined that the restoration does not meet the established success criteria (included in the restoration plan), SCE will modify and implement additional restoration actions, developed in consultation with resource agencies, to improve restoration success to meet the criteria.

# TABLES

## Table A-1. Preliminary List of Construction Equipment at the June Mountain Ski Area Parking Lot

| Equipment Description |
|---|
| Skycrane Helicopter, Heavy Lift (11,000-lb. load capacity) |
| Modified Black Hawk Helicopters, Moderate Lift (6,000-lb. load capacity) |
| A-Star 350, Light Lift Helicopter (2,500-lb. load capacity) |
| Helicopter Fuel Storage Tanks (including secondary containment) |
| K-rail Barriers (control access to landing sites) |
| 20-foot Cargo Van |
| Office Trailers (one for SCE project management and one for contractor construction personnel) |
| 25-kW Generators (two total—one for each office trailer) |
| Telehandler Forklift |
| Concrete Flight Buckets |
| Storage Containers |
| Debris Boxes |
| Concrete Waste Bin |
| 10-wheel Dump Truck |
| Water Tender (including minimum of 50 feet of hose) |
| Street Sweeper |
| Cat 313 Excavator |
| Cat 950 Loader |
| Sanitary Facilities (port-a-johns) |
| Security Kiosk |
| Fire Suppression Equipment and Fire Box |
| Type 6 Fire Engine (minimum 300-gallon capacity) |

Key:
kW = kilowatt
lb. = pound
SCE = Southern California Edison Company

## Table A-2. Proposed Project Facilities

| Proposed Project Facility | | Remove | Retain |
|---|---|---|---|
| **Rush Meadows Dam Area** | | | |
| Dam | Rush Meadows Dam | X | |
| Reservoir | Waugh Lake | X | |
| Valve House | Rush Meadows Dam Valve House | X | |
| Stream Gage | Rush Creek below Rush Meadows (Waugh Lake) (USGS No. 10287262; SCE No. 359r) | | X |
| Reservoir Gage | Waugh Lake (USGS No. 10287260; SCE No. 359) | X | |
| Trail | Rush Meadows Dam Access Trail | X | |
| Rush Meadows Dam/Waugh Lake Ancillary and Support Facilities | Rush Meadows Dam Equipment Shed | X | |
| | Rush Meadows Dam Gage House | X | |
| | Rush Meadows Dam Solar Facility | X | |
| **Gem Dam Area** | | | |
| Dam | Gem Dam | | X |
| Reservoir | Gem Lake | | X |
| Flowline | Gem Dam to Agnew Junction Flowline | | X |
| Valve House | Gem Valve House and Cabin | | X |
| | Gem Dam Arch 8 Valve House | | X |
| | Gem Flowline Valve House | | X |
| Stream Gage | Rush Creek below Gem Lake (USGS No. 10287281; SCE No. 352r) | | X |
| Reservoir Gage | Gem Lake (USGS No. 10287280; SCE No. 352) | | X |
| Communication Lines | Communication Line from Rush Creek Powerhouse to Gem Lake Dam | | X |
| | Communication Line from Gem Valve House to Arch 8 Valve House | | X |
| | Communication Line from Gem Tram Hoist House to Gem Valve House | | X |
| Trams and Hoist Houses | Gem Tram | | X |
| | Gem Tram Hoist House | | X |
| | Gem Tram Lower/Upper Landing | | X |
| Trails | Lower Gem Dam Access Trail | | X |
| | Gem Dam Arch 8 Access Trail | | X |
| | Upper Gem Dam Access Trail | | X |

| Proposed Project Facility | | Remove | Retain |
|---|---|---|---|
| Gem Dam/Lake Ancillary and Support Facilities | Gem Lake Dock | | X |
| | Gem Lake Motor Barge | | X |
| | Gem Bunkhouse | | X |
| | Gem Outhouse | | X |
| | Gem Cookhouse | | X |
| | Gem Dam Compressor Shed | | X |
| | Gem Dam Storage Shed | | X |
| | Gem Dam Overhead Hoist House for Dam Length | | X |
| | Gem Dam Overhead Hoist House | | X |
| | Gem Fish Release Footbridge | | X |
| | Gem Tram Landing Footbridge | | X |
| | Gem Tram Bridge | | X |
| | Gem Weather Station | | X |
| | Gem Satellite Dish | | X |
| | Gem Solar Facility | | X |
| | Gem Valve House Tunnel | | X |
| **Agnew Dam Area** | | | |
| Dam | Agnew Dam | X | |
| Reservoir/Natural Lake | Agnew Lake | | X (natural lake) |
| Flowline | Agnew Dam to Agnew Junction Flowline | X | |
| Valve House | Agnew Junction (Valve House and Stand Pipe) | | X |
| | Agnew Dam Valve House | X | |
| Stream Gage | Rush Creek below Agnew Lake (USGS No. 10287289; SCE No. 357) | | X |
| Reservoir Gage | Agnew Lake (USGS No. 10287285; SCE No. 351) | X | |
| Power Lines | 4-kV Agnew Distribution Line | | X |
| | 4-kV Agnew Dam Tap Line | X | |
| | 4-kV Upper Agnew Boat Dock Tap Line | | X |
| Communication Line | Communication Line from Agnew Hoist House to Agnew Boathouse | | X |

| Proposed Project Facility | | Remove | Retain |
|---|---|---|---|
| Trams and Hoist Houses | Agnew Tram | | X |
| | Agnew Tram Hoist House | | X |
| | Agnew Tram Landing | | X |
| Trail | Agnew Stream Gage Access Trail | | X |
| Agnew Dam/Lake Ancillary and Support Facilities | Lower Agnew Lake Boathouse/Dock | | X |
| | Upper Agnew Lake Boathouse/Dock | | X |
| | Agnew Lake Motor Barge | | X |
| | Agnew Cabin | | X |
| | Agnew Weather Station | X | |
| | Agnew Flume (downstream of Agnew Dam) | | X |
| **Rush Creek Powerhouse Area** | | | |
| Penstocks | Agnew Junction to Rush Creek Powerhouse Penstock (No. 1) | | X |
| | Agnew Junction to Rush Creek Powerhouse Penstock (No. 2) | | X |
| Powerhouse | Rush Creek Powerhouse | | X |
| Gage | Rush Creek Powerhouse (USGS No. 10287300; SCE No. 367) | | X |
| Power Line | 2.4-kV Switchyard to Powerhouse Distribution Line | | X |
| Powerhouse Ancillary and Support Facilities | Rush Creek Powerhouse Complex Access Road | | X |
| | Cottages (2) | | X |
| | Garages (4) | | X |
| | Warehouse and Dock | | X |
| | Machine Shop | | X |
| | Pump House | | X |
| | Woodsheds (2) | | X |
| | Helicopter Landing Site | | X |
| | Tank (propane) | | X |
| | Bridge over Powerhouse Tailrace | | X |
| | Bridge over Rush Creek | | X |

Key:
kV= kilovolt
SCE = Southern California Edison Company
USGS = United States Geological Survey

## Table A-3. Overview of Construction Activities Associated with Partial Removal of Rush Meadows Dam

| | Partial Dam Removal |
|---|---|
| Number of Construction Seasons | 1 |
| On-site Use of Demolition Material (cy) | 2,286 |
| Export of Demolition Material (cy) | 0 |
| Import of Stabilizing Material (cy) | 55 |
| Helicopter Trips (RT) | 150 |
| • Heavy Lift | 94 |
| • Light Lift | 56 |
| Truck Trips (RT) | 261 |
| • Construction | 245 |
| • Disposal | 16 |
| Mule Trips (RT) | 554 |

Key:
cy = cubic yard
RT = round trip

## Table A-4. Estimated Helicopter and Truck Trips Associated with Partial Removal of Rush Meadows Dam by Construction Season and Month

| Helicopter Trips[1,2] | | | Truck Trips[3,4] | | |
|---|---|---|---|---|---|
| Total Trips (RT) | Trips/ Construction Season | Trips/ Month | Total Trips (RT) | Trips/ Construction Season | Trips/ Month |
| 150 | 150 | 30 | 261 | 261 | 52.2 |

Notes:
1 Helicopter trip calculations include construction operations only. Trips associated with restoration are not included.
2 Helicopter trip calculations are based on estimated weight (pounds) of material.
3 Truck trip calculations include construction operations only. Trips associated with restoration are not included.
4 Truck trip calculations are based on estimated weight (pounds) of material.
Key:
RT = round trip

## Table A-5. Preliminary List of Construction Equipment Associated with Partial Removal of Rush Meadows Dam

| Equipment Type | Example Make/Model | Quantity (No.) |
|---|---|---|
| Excavator, Large | CAT 340F | 1 |
| Excavator, Medium | CAT 330 | 1 |
| Excavator, Mini | CAT 306 | 1 |
| Tracked Dump | Panther T6 | 2 |
| Mobile Crane | Grove 30 Ton | 1 |
| Concrete Batch Plant | EZ 1-1 | 1 |
| Stabilizing Material Pump | Warrior 500 | 1 |
| Water Pump | Honda WB2.0XT | 1 |
| Fuel Tank Trailer | Lee DT 975 | 1 |
| Potable Water Tank | Norwesco 44115 | 1 |
| Welder | Miller Bobcat 200 | 1 |
| Container | job office | 1 |
| Container | tool unit | 2 |
| Work Platform | — | 4 |
| Temporary Bridge | 40-foot shipping length | 2 |

## Table A-6. Overview of Construction Activities Associated with Partial Removal of Agnew Dam

| | Partial Dam Removal |
|---|---|
| Number of Construction Seasons | 1 |
| On-site Use of Demolition Material (cy) | 1,515 |
| Export of Demolition Material (cy) | 0 |
| Import of Stabilizing Material (cy) | 35 |
| Helicopter Trips (RT) | 110 |
| • Heavy Lift | 75 |
| • Light Lift | 35 |
| Truck Trips (RT) | 76 |
| • Construction | 63 |
| • Disposal | 13 |
| Mule Trips (RT) | 0 |

Key:
cy = cubic yards
RT = round trip

### Table A-7. Estimated Helicopter and Truck Trips Associated with Partial Removal of Agnew Dam by Construction Season and Month

| Helicopter Trips[1,2] | | | Truck Trips[3,4] | | |
|---|---|---|---|---|---|
| Total Trips (RT) | Trips/ Construction Season | Trips/ Month | Total Trips (RT) | Trips/ Construction Season | Trips/ Month |
| 110 | 110 | 22 | 76 | 76 | 15.2 |

Notes:

[1] Helicopter trip calculations include construction operations only. Trips associated with restoration are not included.

[2] Helicopter trip calculations are based on estimated weight (pounds) of material.

[3] Truck trip calculations include construction operations only. Trips associated with restoration are not included.

[4] Truck trip calculations are based on estimated weight (pounds) of material.

Key:

RT = round trip

### Table A-8. Preliminary List of Construction Equipment Associated with Partial Removal of Agnew Dam

| Equipment Type | Example Make/Model | Quantity (No.) |
|---|---|---|
| Excavator, Large | CAT 340F | 1 |
| Excavator, Medium | CAT 330 | 1 |
| Excavator, Mini | CAT 306 | 1 |
| Tracked Dump | Panther T6 | 2 |
| Mobile Crane | Grove 30 Ton | 1 |
| Concrete Batch Plant | EZ 1-1 | 1 |
| Stabilizing Material Pump | Warrior 500 | 1 |
| Water Pump | Honda WB2.0XT | 1 |
| Fuel Tank Trailer | Lee DT 975 | 1 |
| Potable Water Tank | Norwesco 44115 | 1 |
| Welder | Miller Bobcat 200 | 1 |
| Container | restroom/shower | 1 |
| Container | job office | 1 |
| Container | tool unit | 2 |
| Work Platform | — | 2 |
| Temporary Bridge | 40-foot shipping length | 2 |

## Table A-9. Gem Dam and Lake Specifications

| | Existing (Seismic Restriction) | Post Retrofit |
|---|---|---|
| **Dam** | | |
| Type | Multiple arch (16 complete; 2 partial) | No change |
| Material | Concrete | No change |
| Height (maximum) | 84 feet | 62 feet |
| Length | 688 feet | No change |
| Volume | 21,612 cubic yards | 21,612 cubic yards |
| Elevation of Dam Crest | 9,057.5 feet | 9,035 feet |
| **Spillway** | | |
| Type | Uncontrolled | No change |
| Upper Spillway Elevation | 9,053.64 feet | 9,027.5 feet |
| • Openings/Dimensions | 5 openings / 5 feet wide x 2 feet high | Wide, ungated, free overflow spillway in Arches No. 10 to No. 14 |
| Lower Spillway Elevation | 9,051.63 feet | Removed |
| • Openings/Dimensions | 8 openings / 5 feet wide x 2 feet high | Removed |
| Capacity (maximum) | 1,100 cubic feet per second | 8,700 cubic feet per second |
| **Reservoir** | | |
| Elevation at Maximum Operating Water Surface | 9,027.5 feet | 9,027.5 feet |
| Gross Storage | 10,752 acre-feet | 10,752 acre-feet |
| Area at Maximum Operating Water Surface | 256 acres | 256 acres |

## Table A-10. Overview of Construction Activities Associated with Gem Dam Retrofitting

| | Gem Dam Retrofitting |
|---|---|
| Number of Construction Seasons | 3 |
| On-site Use of Demolition Material (cy) | 10,198 |
| Export of Demolition Material (cy) | 0 |
| Import of Stabilizing Material (cy)[1] | 3,000 |
| Helicopter Trips (RT) | 1,980 |
| • Heavy Lift | 1,380 |
| • Light Lift | 600 |
| Truck Trips (RT) | 2,000 |
| • Construction | 1,825 |
| • Disposal | 175 |
| Mule Trips (RT) | 3,600 |

Notes:

[1] The amount of import material does not reflect the import of recycled material from Agnew Dam for retrofitting of Gem Dam. The availability of recycled material from Agnew Dam would be determined pending future material examination/testing by a contractor in coordination with a geotechnical engineer and a structural engineer.

Key:

cy = cubic yards

RT = round trip

## Table A-11. Estimated Helicopter and Truck Trips Associated with Gem Dam Retrofitting by Construction Season and Month

| Helicopter Trips[1,2] | | | Truck Trips[3,4] | | |
|---|---|---|---|---|---|
| Total Trips (RT) | Trips/ Construction Season | Trips/ Month | Total Trips (RT) | Trips/ Construction Season | Trips/ Month |
| 1,980 | 660 | 132 | 2,000 | 665 | 133 |

Notes:

[1] Helicopter trip calculations include construction operations only. Trips associated with restoration are not included.

[2] Helicopter trip calculations are based on estimated weight (pounds) of material.

[3] Truck trip calculations include construction operations only. Trips associated with restoration are not included.

[4] Truck trip calculations are based on estimated weight (pounds) of material.

Key:

RT = round trip

## Table A-12. Preliminary List of Construction Equipment Associated with Gem Dam Retrofitting

| Equipment Type | Example Make/Model | Quantity (No.) |
|---|---|---|
| Excavator, Large | CAT 340F | 1 |
| Excavator, Medium | CAT 330 | 1 |
| Excavator, Mini | CAT 306 | 1 |
| Tracked Dump | Panther T6 | 2 |
| Mobile Crane | Grove 30 Ton | 1 |
| Track Drill | IR ECM370 | 1 |
| Boom Man Lift | Genie S-65 HF | 2 |
| Concrete Batch Plant | EZ 1-1 | 1 |
| Water Pump | Honda WB2.0XT | 1 |
| Fuel Tank Trailer | Lee DT 975 | 1 |
| Potable Water Tank | Norwesco 44115 | 1 |
| Welder | Miller Bobcat 200 | 1 |
| Container | job office | 1 |
| Container | tool unit | 2 |
| Work Platform | — | 4 |
| Barges (Floats) | — | 2 |
| Skiff | — | 1 |
| Temporary Bridge | 40-foot shipping length | 2 |

# FIGURES

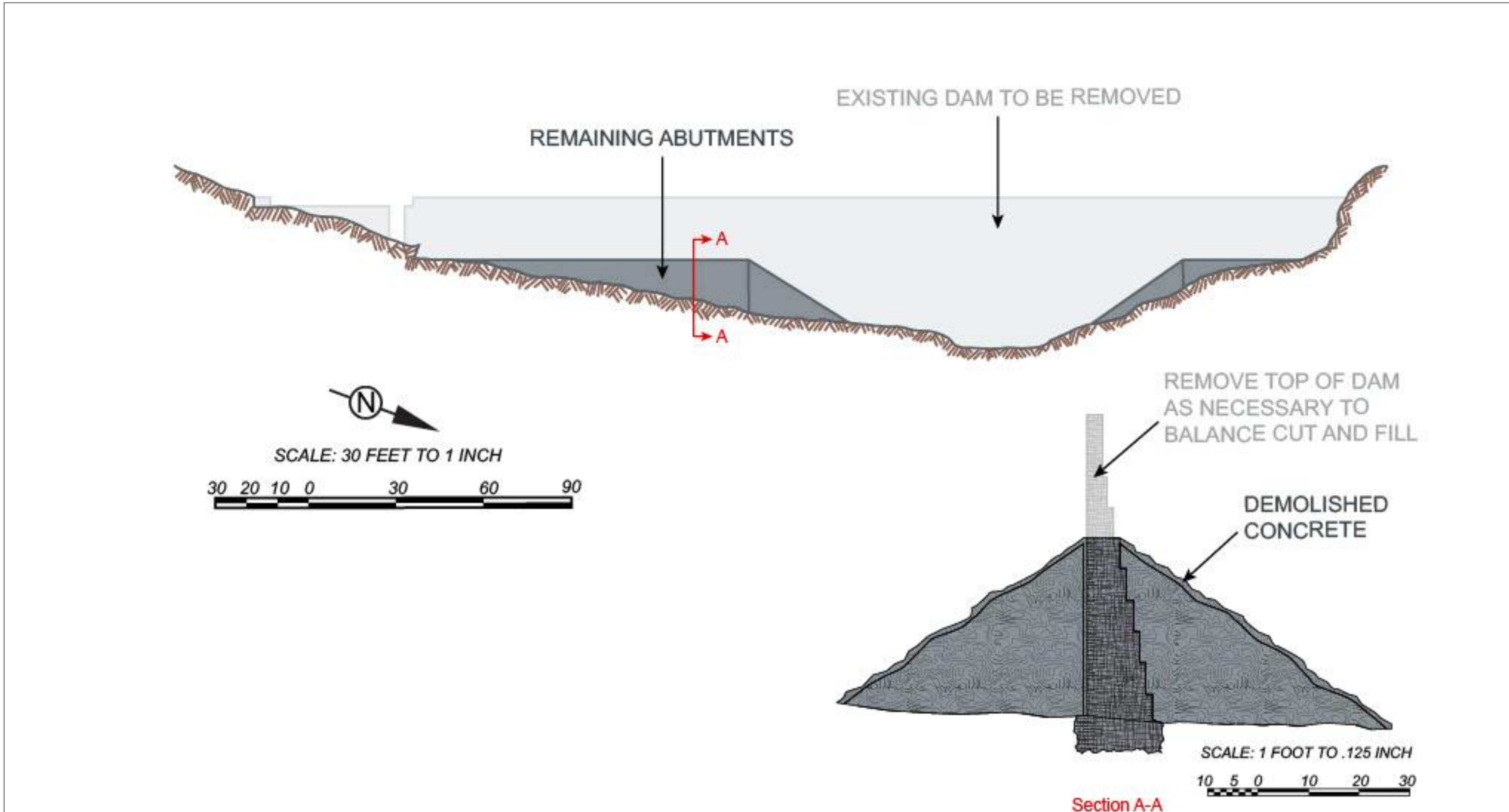



**Figure A-1. Cross Section of the Existing Rush Meadows Dam and Remaining Abutments Associated with Partial Dam Removal**

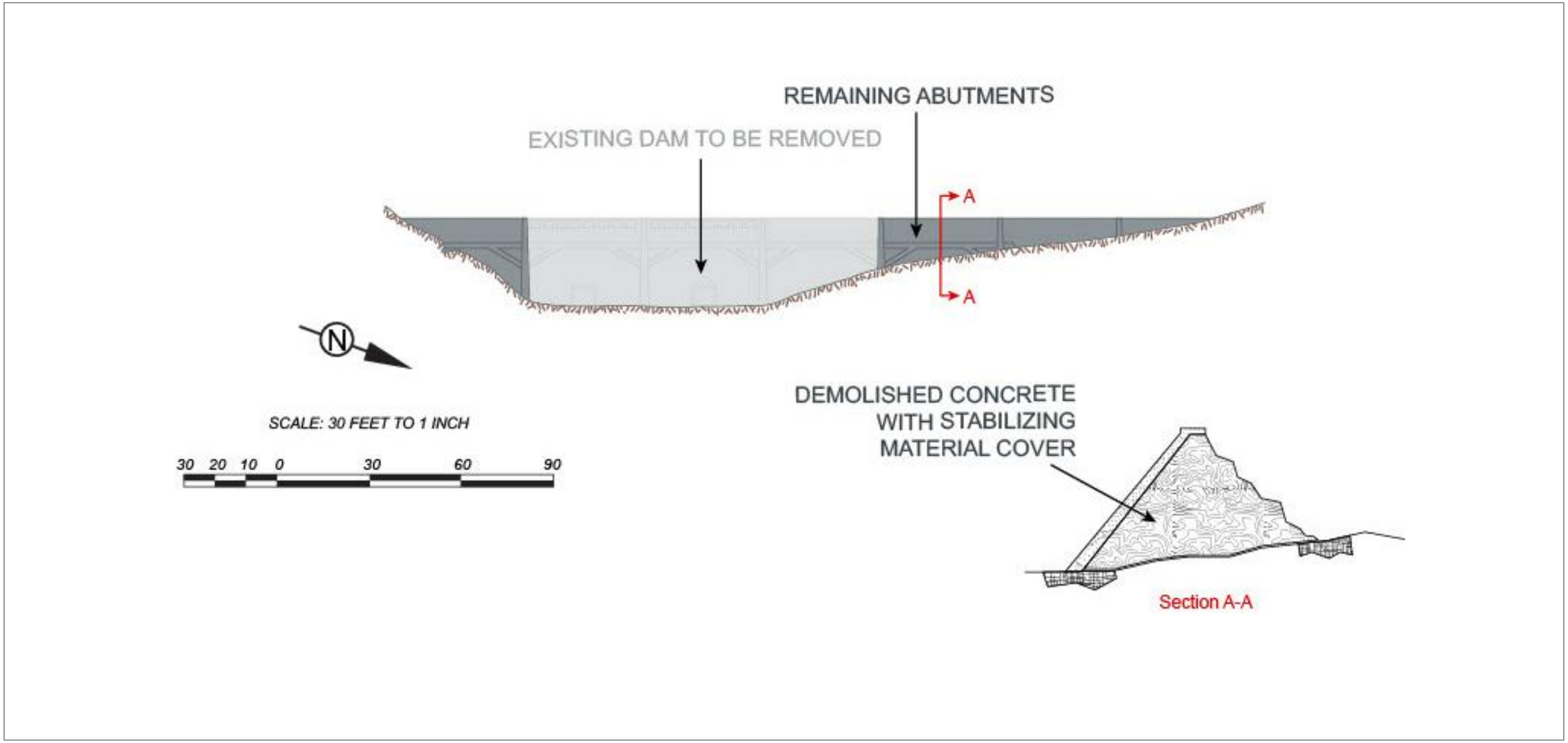



**Figure A-2. Cross Section of the Existing Agnew Dam and Remaining Abutments Associated with Partial Dam Removal**

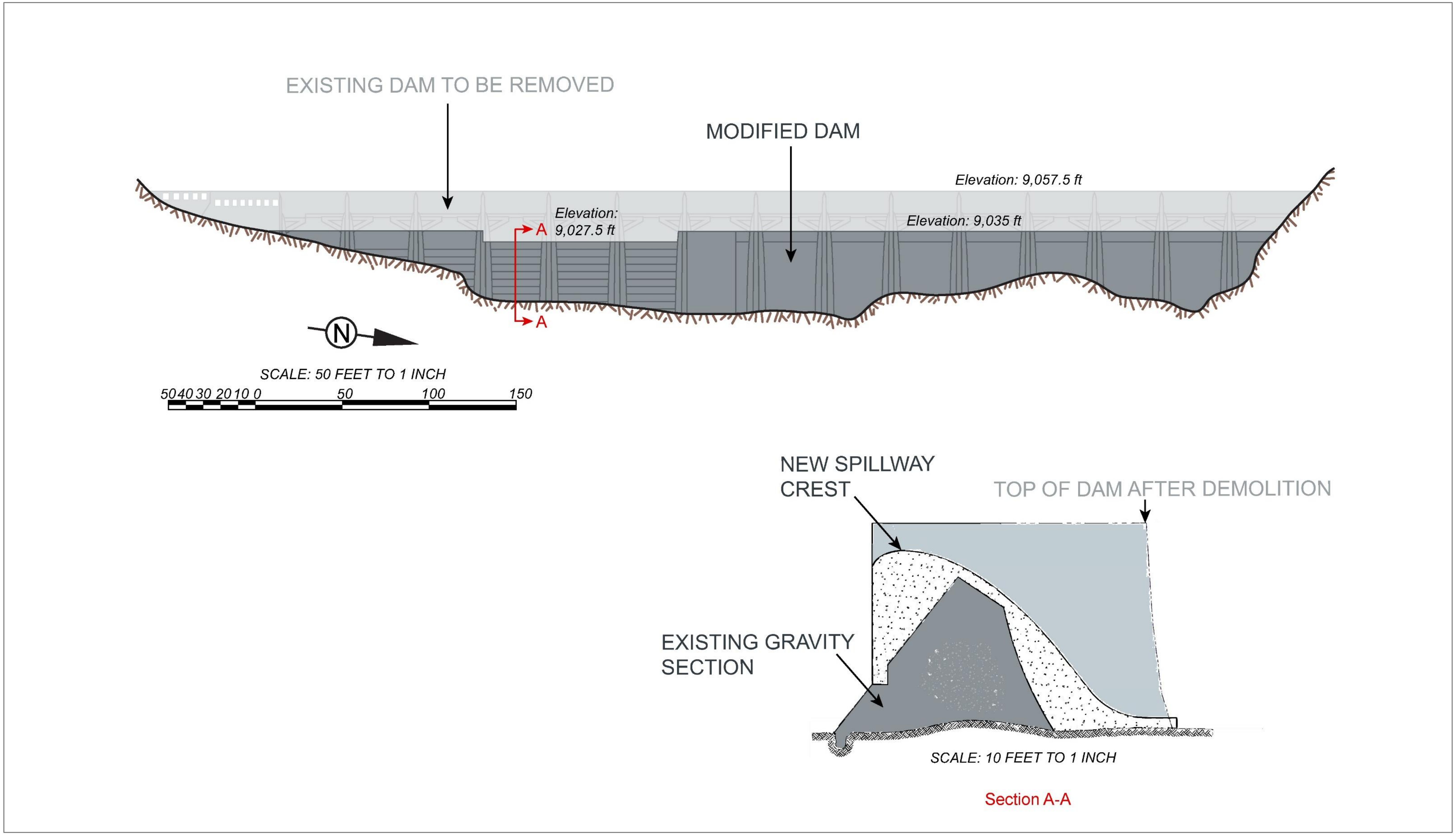
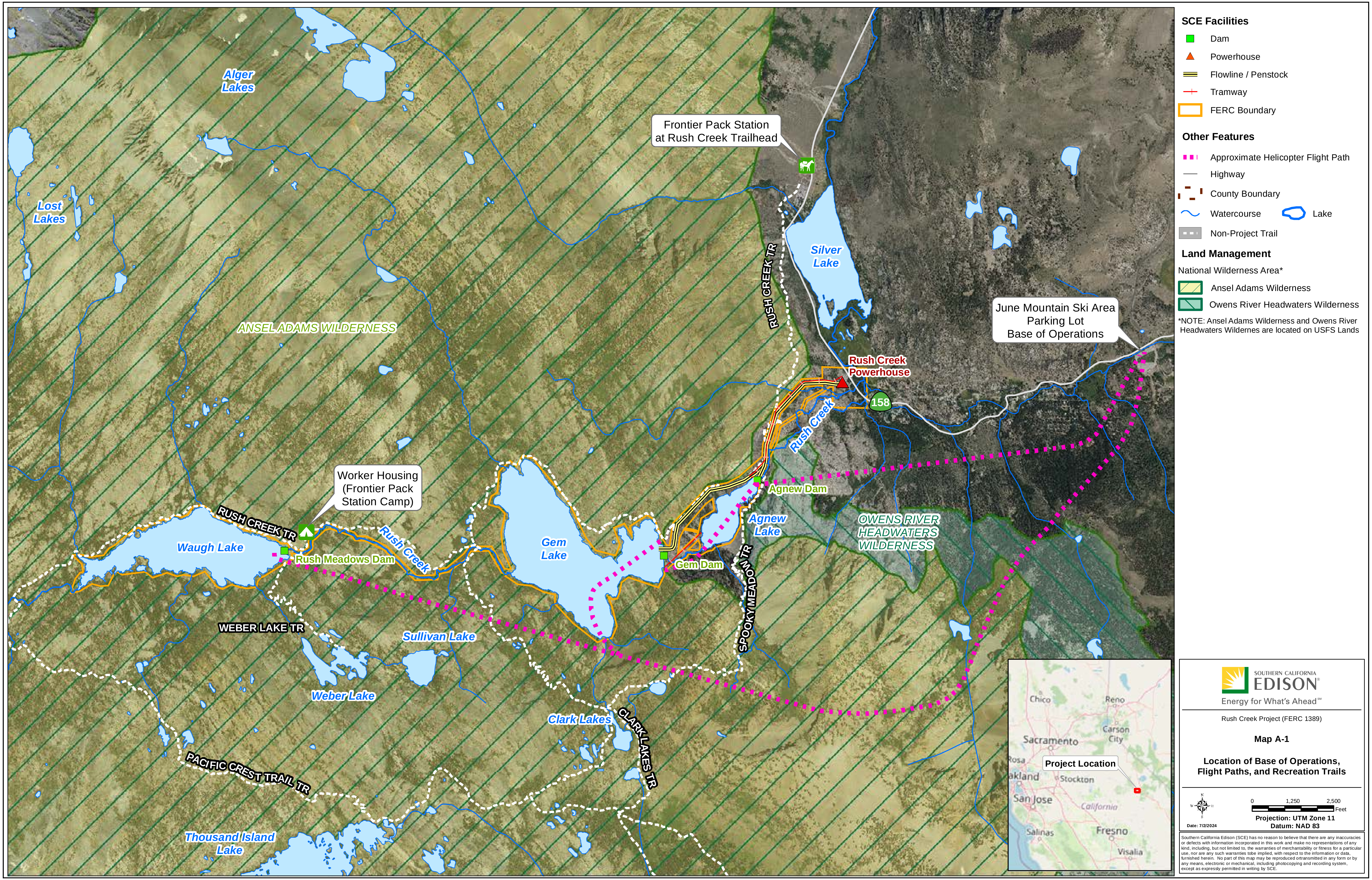
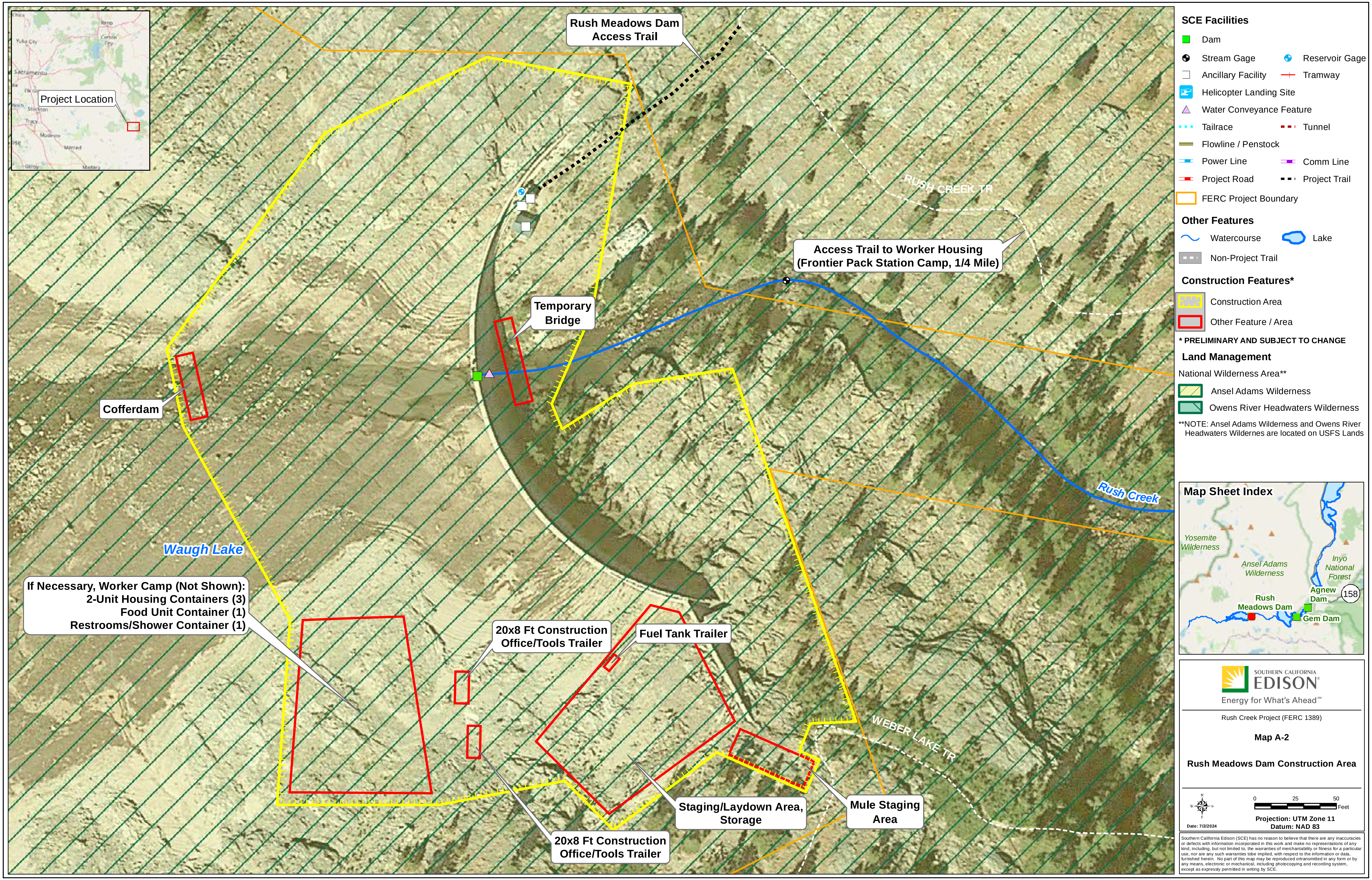



**Figure A-3. Cross Section of the Existing Gem Dam and Modified Dam Associated with Gem Dam Retrofitting**

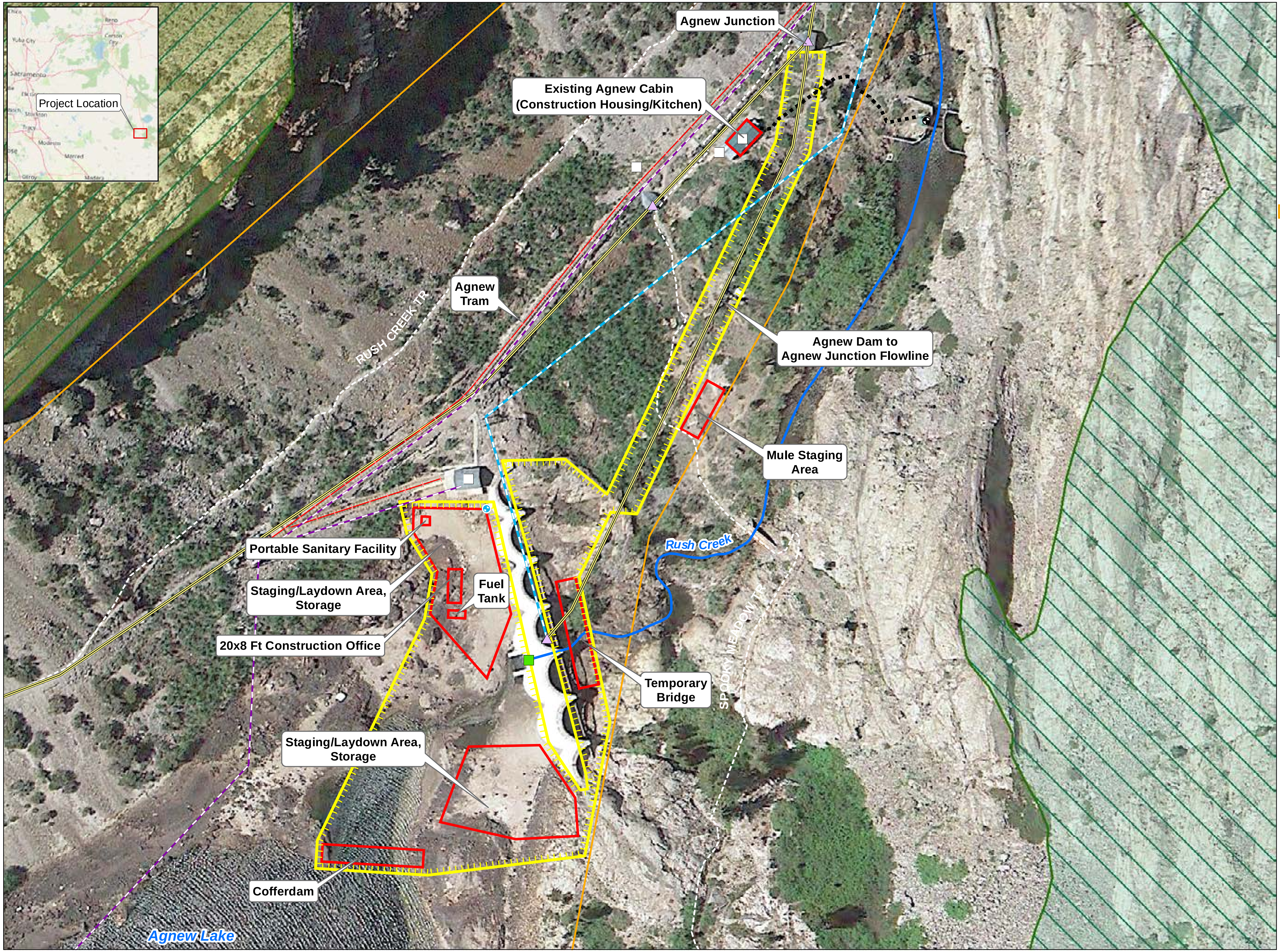
# MAPS




C:\GIS\237800343\map\Rush Creek\FacilitiesMaps\ProposedActionMaps\SCE_RUSH_CREEK_PropActn_Ops_Flight_Trails_17i11i_02.mxd




C:\GIS\237800343\map\Rush Creek\FacilitiesMaps\ProposedActionMaps\SCE_RUSH_CREEK_PropActn_Const_Details_17i11i_04.mxd




**SCE Facilities**

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

**Other Features**

- Watercourse
- Lake
- Non-Project Trail

**Construction Features***

- Construction Area
- Other Feature / Area

* PRELIMINARY AND SUBJECT TO CHANGE

**Land Management**

National Wilderness Area**

- Ansel Adams Wilderness
- Owens River Headwaters Wilderness

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

**Map Sheet Index**


SOUTHERN CALIFORNIA EDISON®
Energy for What's Ahead℠

Rush Creek Project (FERC 1389)

**Map A-3**

**Agnew Dam Construction Area**

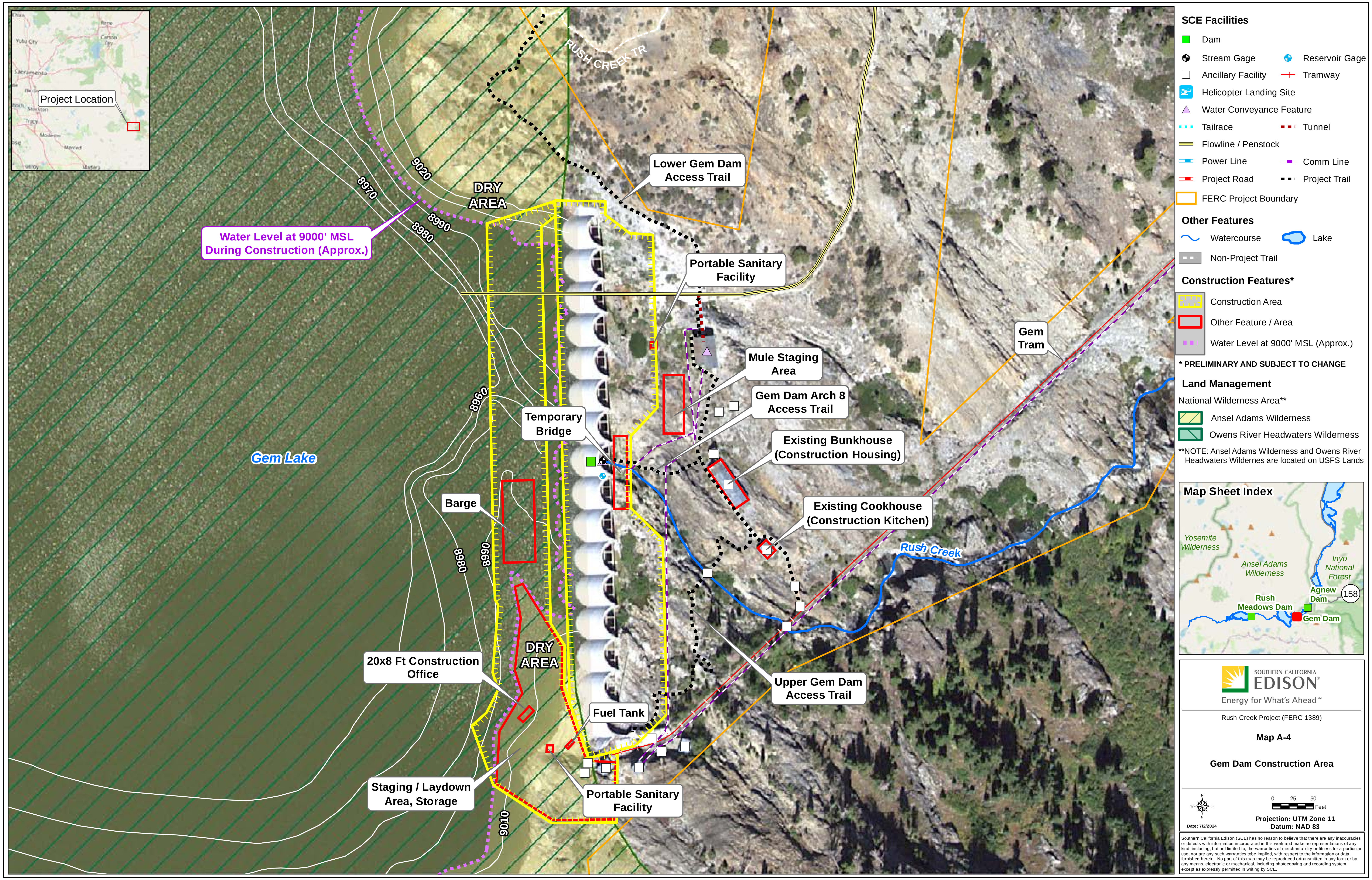
Date: 7/2/2024

0 25 50 Feet

**Projection: UTM Zone 11**
**Datum: NAD 83**



C:\GIS\237800343\map\Rush Creek\FacilitiesMaps\ProposedActionMaps\SCE_RUSH_CREEK_PropActn_Const_Details_17i11i_04.mxd




Rush Creek Project (FERC 1389)

**Map A-4**

**Gem Dam Construction Area**

0 25 50 Feet

**Projection: UTM Zone 11**
**Datum: NAD 83**

**Date: 7/2/2024**



C:\GIS\237800343\map\Rush Creek\FacilitiesMaps\ProposedActionMaps\SCE_RUSH_CREEK_PropActn_Const_Details_17i11i_04.mxd

# APPENDIX 5-B

## Construction Measures

## APPENDIX 5-B CONSTRUCTION MEASURES

Under the Proposed Action, Southern California Edison Company (SCE) will implement resource protection measures during construction of Rush Creek Project (Project) facility modifications, including avoidance and protection measures and best management practices (BMP). This appendix includes a preliminary list of measures to be implemented during construction along with pertinent United States Forest Service water quality BMPs based on their *National Best Management Practices for Water Quality Management on National Forest System Lands* (Forest Service 2012).

Following completion of site-specific engineering designs for each modification, SCE will review the preliminary measures with resource agencies for adequacy in protecting resources. If additional site-specific construction measures are necessary, or existing measures require modification, they will be developed in consultation with resource agencies and implemented as part of Project modification activities.

### REFERENCES

Forest Service (United States Forest Service). 2012. National Best Management Practices for Water Quality Management on National Forest System Lands, Volume 1: National Core BMP Technical Guide. Available at https://www.fs.usda.gov/sites/default/files/FS_National_Core_BMPs_April2012_sb.pdf.

# AVOIDANCE AND PROTECTION MEASURES AND BEST MANAGEMENT PRACTICES

## GENERAL CONSTRUCTION MEASURES

- All contractors and staff will be made aware of the ecological and cultural resource values of each site and will be given instructions to comply with site-specific avoidance and protection measures and best management practices.
- Construction activities will be limited to a designated work area (including the work corridor and staging area). The work area will be clearly identified on the construction drawings and shall be staked and flagged where necessary prior to initiation of construction activities.
- Construction activities will be implemented 10 hours per day, beginning after sunrise (but no earlier than 7:00 a.m.), and ending before sunset (but no later than 7:00 p.m.) Monday through Saturday. Active construction will not occur on Sunday.

## AIR QUALITY MEASURES

- Contractors will be required to comply with provisions of the Great Basin Air Pollution Control District Rule 401 – Fugitive Dust, including, but not limited to, the following practices:
  - Stabilize unpaved areas subject to vehicle traffic by watering, treating with a non-toxic chemical dust suppressant, or covering.
  - Stabilize storage piles and disturbed areas not subject to vehicular traffic by keeping wet, treating with a non-toxic chemical dust suppressant, or covering when material is not being added to, or removed from, the pile.
  - Prior to any ground disturbance, including grading, excavating, and land clearing, apply sufficient water to the area to be disturbed to limit dust and minimize emissions.
- Limit the speed of any vehicles and equipment traveling across unpaved areas to no more than 5-10 miles per hour unless the road surface and surrounding area is sufficiently stabilized.
- Clean construction vehicles leaving the site to prevent dust, silt, mud, and dirt, from being released or tracked offsite.
- Dry mechanical sweeping and use of blower devices is prohibited. All visible track-out material from vehicles leaving the work site shall be removed from paved, public streets using wet sweeping or a high efficiency particulate air filter equipped vacuum device.
- Suspend grading and earthmoving operations if wind speeds are high enough to result in dust emissions crossing the construction work area boundary, despite the application of dust mitigation measures.

- Prevent dust emissions from materials hauled off-site by adequately wetting all loads and either covering completely with tarps or ensuring at least six inches of freeboard on the front, back, or sides of the cargo compartment and that no point of the load extends above the top of the cargo compartment.
- Depending on equipment availability, require that all diesel construction engines with a rating of 50 horsepower or greater meet, at a minimum, the Tier 4 California emission standards for off-road engines (13 CCR 2423(b)(1)(B)).
- Consistent with the California Air Resources Board’s In-Use Off-Road Diesel-Fueled Fleets Regulations, require contractors to limit idling of construction vehicles and equipment onsite to five minutes or less, unless idling is necessary for effective work progress or equipment operation.
- Require contractors to maintain construction equipment in proper working order, and in accordance with manufacturer specifications.

## BIOLOGICAL RESOURCES MEASURES

### General Wildlife Measures

- To avoid entrapment of small animals (e.g., amphibians or small mammals), SCE will:
  - Cover open excavations at the end of each workday or install escape ramps.
  - Inspect open excavations prior to initiation of each workday.
  - If any animal is found entrapped in an excavation and cannot leave of its own accord (e.g., using escape ramps or other passive methods), workers will follow the protocol for previously undiscovered species.
  - Animals will not be handled except by appropriately permitted individuals.
- Protocol for previously undiscovered species
  - Observances of special-status species will be reported to the SCE Environmental Resources Manager as soon as practicable.
  - All activities that have the potential to result in harassment, injury, or death of any animal will cease until the animal moves out of harm’s way on its own accord.
  - Work may resume after the animal moves out of harm’s way.
  - Animals will not be handled except by appropriately permitted individuals.

### Fish and Aquatic Species Measures

- Prior to construction, SCE will prepare a Fish Rescue and Relocation Plan which details the approach for rescuing and relocating stranded fish prior to and during construction activities.

### Special-status Plant Measures

- Prior to each construction and/or restoration season, SCE will flag all whitebark pines and unknown five-needle pines within a 100-foot buffer of construction work areas and staging areas.
- Whitebark pine or unknown five-needle pine individuals of all size classes will be avoided, to the degree possible
- If removal of whitebark pines or unknown five-needle pines is necessary to complete the proposed Project facility modifications, the following will be implemented:
  - SCE will obtain “take” authorization from United States Fish and Wildlife Service to remove individual whitebark pine, if necessary. All conditions of the take permit will be implemented as part of the Project.
  - The location and size (diameter at breast height) of each tree removed will be recorded.
  - Whitebark pines will be replanted onsite at a 3:1 ratio as part of restoration activities.
  - Specific replanting and monitoring methods will be developed in consultation with resource agencies, documented in the Restoration Plans, and implemented as part of the project.

### Non-Native Invasive Plant Measures

- SCE will implement the following measures to prevent the introduction or spread of non-native invasive plants (NNIP):
  - All ground-disturbing construction equipment and vehicles will be cleaned prior to transport to the construction work areas.
  - SCE will maintain stockpiles of gravel and soil in a weed-free state.
  - Workers will inspect, remove, and properly dispose of readily observable weed seeds and plant parts found on their clothing and equipment. Proper disposal includes bagging the seeds and plant parts prior to disposal.
  - Certified weed-free hay, mulch, or straw will be used for erosion control. If certified weed-free straw is not available, certified weed-free rice straw will be used. If weed-free material is not available, SCE will consult with Forest Service botanist regarding other options (e.g., sterilized straw pellets).
- SCE will monitor restoration areas for the presence of NNIPs (introduction of new populations or expansion of existing populations)
  - New or expanded populations of NNIPs (as agreed upon in consultation with Inyo National Forest) will be removed or otherwise treated, as necessary

- Specific NNIP monitoring and treatment methods will be developed in consultation with resource agencies, document in the Restoration Plans, and implemented as part of the Project.

**Riparian Measures**

- Riparian vegetation removal or trimming will be limited to the minimum necessary to allow for installation of temporary bridges/establishment of temporary access routes along the downstream side of the dams; placement of concrete to support the dam abutments; and removal of the Agnew Flowline.
- All other riparian habitat located outside of immediate work areas would be flagged for avoidance.

**Special-Status Amphibian Measures**

- At the Rush Meadows Dam/Waugh Lake site, SCE will conduct a clearance survey for Sierra Nevada yellow-legged frog (SNYLF) and Yosemite toad (YT) within 30 days prior to each construction and/or restoration season at Rush Meadows Dam/Waugh Lake.
- At the Rush Meadows Dam/Waugh Lake site, in the unlikely event that SNYLF and YT individuals are encountered during clearance surveys, a biological monitor trained in identification and avoidance/protection procedures for SNYLF and/or YT will be onsite during ground disturbance/excavation or other activities with the potential to harm, harass, injure or kill individual SNYLF and/or YT. The biological monitor will have stop-work authority and will determine if additional measures to protect individual SNYLF or YT are necessary. These may include, but are not limited to exclusion fencing, signage, or other measures necessary to protect the animals.
- To prevent the spread of the Chytrid pathogen, all equipment (including hand-held equipment such as shovels) will be cleaned and free of mud and dirt prior to being transported to the construction and restoration work areas at Waugh Lake, Agnew Lake, and Gem Lake.
- SCE will not use tightly woven fiber netting, plastic mono-filament netting, or similar material for erosion control or other purposes in order to minimize the chances for wildlife to be trapped, injured, or killed.
- Any water pumping will be conducted by using low velocity water pumps with associated screening devices to protect mortality of eggs, tadpoles, juveniles, and adults.

**Special-Status Raptor Measures**

- A qualified biologist will conduct a survey for active raptor nests no more than 30 days prior to initiation of each construction and/or restoration season.

- The survey area will include suitable forest or cliff habitat within 0.25 mile of Project work areas, staging areas, worker campsites, and within 0.25 mile on either side of the helicopter flight path.
- Surveys may be conducted on foot (including using binoculars or spotting scopes from designated observation points), by helicopter, or some combination thereof, as determined in consultation with resource agencies.
- If a nest is identified, a species-specific protective buffer will be applied consistent with SCE's Avian Protection Plan and/or previously established agency regulations and policies. Both horizontal and vertical buffers would be developed for nests located along the helicopter flight path. All potentially disturbing activities will be excluded within the buffer until it has been determined that the nestlings have fledged and are no longer dependent on the nest.
- If SCE is unable to implement the Project with the established buffers, SCE will consult with resource agencies to develop site-specific buffers that consider site-specific conditions, the species, the location of the nest, and the nature of the construction activities to be implemented in order to avoid take of the nest.

**Other Special-Status Bird Measures**

- Vegetation removal required for implementation of Project facility modifications will occur outside of the breeding season for special-status songbirds (typically March through August, or as determined through consultation with resource agencies).
- If vegetation removal must occur during the breeding season, SCE will conduct surveys at least 2 weeks prior to removal to determine the location of any active bird nests.
- If a nest is identified, a species-specific protective buffer will be applied consistent with SCE's Avian Protection Plan. All potentially disturbing activities will be excluded within the buffer until it has been determined that the nestlings have fledged and are no longer dependent on the nest.

**Special-Status Bat Measures**

- In the year prior to each construction season, a qualified biologist will survey Project facilities that will be removed/modified during proposed Project facility modifications to determine whether active bat roosts (maternity or day roosts) are present.
- If an active roost is identified that would be affected by facility modifications or removals, SCE will install exclusion devices and/or deterrents on the Project facility in the year prior to construction. Methods of exclusion, which may include, but is not limited to sealing or modification of structures, installation of one-way doors or check-valves, caulk, flashing, or screening, will be determined based on the species, size and location of bat roost, and type of facility.

### CULTURAL AND TRIBAL RESOURCES MEASURES

- SCE will develop an Inadvertent Discovery Plan in consultation with the Forest Service Heritage Program Manager (HPM), Tribes and the State Historic Preservation Officer (SHPO).
- Known resources will be flagged for avoidance.
- SCE will prepare site-specific restoration plans for each dam site and reservoir, developed in consultation with the Forest Service HPM, Tribes, and resource agencies.
- Utilize the Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring & Reconstructing Historic Buildings (2017) to minimize effects from Gem Dam retrofits to the dam and the Rush Creek Hydroelectric System Historic District.
- Resolution of Adverse Effects through the Section 106 process pursuant to 36 Code of Federal Regulations (CFR) Part 800.5 assessment of adverse effects and 800.6 resolution of adverse effects. Development of a Memorandum of Agreement that outlines how adverse effects will be resolved and includes a mitigation and monitoring plan or equivalent. Resolution of an adverse effect, as defined in 36 CFR Part 800.6, requires notifying the Advisory Council on Historic Preservation; consulting with the SHPO, Tribes, the Forest Service HPM and other interested parties.

### FIRE PREVENTION AND SUPPRESSION MEASURES

- Prior to construction, SCE will prepare a site-specific fire prevention and safety plan for each construction work area and the Base of Operations.
- The contractor, its employees, and subcontractors and their employees, will make all reasonable efforts to prevent and suppress wildfires, and will exercise diligence in protecting from damage the land and property of the United States.
- No burning of any kind will occur as part of the construction activities.

### HAZARDOUS MATERIALS MEASURES

- Prior to construction, SCE will prepare a Spill Prevention, Control, and Countermeasure Plan intended to prevent spills of pollutants and define response procedures in the event of a spill.
- All hazardous materials will be stored in labeled and chemical compatible containers in accordance with federal, state, and local regulations.
- Emergency spill kits will be maintained onsite for fueling, maintenance, and storage of equipment and chemicals.
- All hazardous waste containers shall be stored in secondary containment.

- Compliance with all applicable local, state, and federal standards associated with handling and disposal of hazardous materials will be required.
- All equipment fueling within the lakebed will be conducted according to agency permit conditions.
- When either a fuel-driven compressor or generator is used, it will be placed in an industry-standard secondary containment that will capture any fuel or oil drips and be located on a minimum of 100 feet from surface waters.
- All fuel and oil will be stored in watertight containers with appropriate, industry standard secondary containment to prevent any spillage or leakage from entering a receiving water.
- Equipment will be refueled and serviced only in designated staging areas.
- All equipment will be cleaned of oil and grease and be inspected prior to entering the National Forest to ensure it is in proper functioning condition.

### LAND USE MEASURES

- Prior to construction, SCE will prepare a Minimum Requirements Analysis for construction activities in designated wilderness areas to support Forest Service issuance of a Wilderness Act Variance. All conditions of the Wilderness Act Variance will be implemented as part of Project facility modifications.
- Prior to construction, SCE will obtain a Special Use Permit (SUP) from the Forest Service for use of the June Mountain Ski Area Parking Lot as the Base of Operations. All conditions of the SUP will be implemented as part of Project facility modifications.
- Prior to construction, SCE will obtain a SUP from the Forest Service which authorizes SCE to leave abutments at Rush Meadows and Agnew dams on National Forest Lands.

### NOISE MEASURES

- Helicopter use will be limited to 8:00 a.m. to 4:00 p.m., Monday through Saturday.
- Avoid generating noise during more sensitive periods of the day (i.e., Community Noise Equivalent Level [CNEL] evening period: 7:00 p.m. to 10:00 p.m. and CNEL nighttime: 10:00 p.m. to 7:00 a.m.).
- To the extent feasible, reduce number of days of flights by condensing more trips into workdays while increasing the number of days with no flights.
- Communicate helicopter flight operations with the public ahead of time.
- Ensure that construction equipment utilizes the manufacturer’s recommended/ provided mufflers and that they are functioning as designed.

- Utilize previously established flight paths to reduce impacts to noise sensitive receptors.
- To the extent feasible, utilize the southern flight path to avoid noise sensitive receptors.

**PUBLIC/AGENCY OUTREACH AND COMMUNICATION MEASURES**

Prior to initiation of construction SCE will:

- Coordinate with the Forest Service and the National Park Service (NPS), as appropriate, regarding procedures for: (1) notifying the public regarding Project activities; (2) issuing future wilderness permits to backcountry recreationists; and (3) evaluating/implementing trail closures and/or camping restrictions during construction.
  - Affected trails may include Rush Creek Trail, Clark Lakes Trail, Spooky Meadows Trail, and Weber Lake Trail.
  - The Rush Creek Trail terminates at its junction with the Pacific Crest Trail/John Muir Trail, which is located approximately 1.2 miles southwest of Rush Meadows Dam; therefore, notifications to hikers along the trail may be required.
  - Following determination of the need for trail or camping restrictions/closures, the Forest Service may issue a future Forest Order pursuant to 16 United States Code 551 and 36 CFR 261.50(a) and (b).

Prior to initiation of construction SCE will:

- Conduct a town hall meeting at June Lake to provide an overview of the upcoming Project activities/schedule for residents, business owners, local government officials, sheriff's department, resource agencies, Tribes, and members of the public. The meeting will provide an opportunity for stakeholders to ask questions and voice concerns.

Prior to initiation of construction/restoration activities, SCE will:

- Conduct a town hall meeting at June Lake (as described above).
- Coordinate with the Forest Service and NPS regarding communicating any trail or area closures associated with the Project to the public, including:
  - Preparation of fliers, if necessary, for distribution at Forest Service visitor centers (e.g., Bishop, Mono Lake, Lone Pine, and Mammoth).
  - Posting of fliers, Forest Service Order(s), and associated maps at pertinent trailheads, Forest Service visitor centers (e.g., Bishop, Mono Lake, Lone Pine, and Mammoth), and the Forest Service website.
- Coordinate with Forest Service air operations regarding helicopter flights and proposed flight paths.

### Recreation Measures

- In all locations, construction activities will be limited to a designated work area (including the work corridor and staging area). This work area will be clearly identified on the construction drawings and will be staked and flagged where necessary prior to initiation of construction activities. As much as possible, staging areas will be in areas that are not visible or only visible for a limited period from the Rush Creek Trail. Staging areas will be limited to the minimum size and extent necessary for construction activities. Where possible, staging and parking areas will be located in pre-disturbed areas.
- Prior to construction, SCE will consult with Frontier Pack Station regarding construction schedule and trail closures.
- Implement Public/Agency Outreach and Communication Measures described above.

### Traffic Measures

- Prior to construction, SCE will prepare a Traffic Management Plan that outlines strategies and measures for safe and efficient traffic flow during construction, including traffic management, signage, lane closures, and detours.
- Prior to construction, SCE will obtain appropriate transportation permits from Caltrans (e.g., oversize/overweight or variance permit) and comply with all measures outlined in the permit.
- During construction and following each construction season, construction-related impacts to roadways will be remediated according to Caltrans requirements.
- Prior to construction, SCE will obtain a county road use permit from Mono County and comply with all measures outlined in the permit.
- Temporary parking and staging areas will be limited to the minimum area needed.

### Visual Resource Measures

- To the extent practical, to minimize visual contrast between construction areas and the natural environment, large machinery and equipment used for construction activities will have a muted color (e.g., earth tones).
- The surface of the remaining dam abutments at Rush Meadows and Agnew dams will be blended into the natural environment as described in the restoration plan for each site.
- SCE will comply with fugitive dust reduction measures to limit dust that could otherwise reduce scenic visibility and obscure views. Refer to Air Quality Measures described above.

## WATER QUALITY AND EROSION CONTROL MEASURES

- SCE will obtain: (1) coverage from United States Army Corps of Engineers under Clean Water Act Section 404, (2) a Section 401 Water Quality Certification from the State Water Resources Control Board; and (3) a Lake or Streambed Alteration Agreement from the California Department of Fish and Wildlife. SCE will comply with all measures outlined in the permits.
- Prior to construction, SCE will prepare a reservoir drawdown and operation plan that minimizes the potential for a seasonal release of high flows (timing) and minimizes the potential for high magnitude releases that could cause flooding downstream during construction. The plan will include an operational model that includes historical hydrology and can assess the effect of proposed construction phases and sequencing on high flows downstream of the construction sites.
- SCE will adaptively implement a construction season each year that avoids construction during potential high flow periods that could exceed the bypass capabilities at the construction sites. In addition, timing of construction (sequencing), design of construction phases, and placement of equipment will be implemented in such a way that minimizes the potential for infrastructure (dams, piping systems, buildings, equipment) damage due to high flow events during construction.
- Prior to construction, SCE will prepare a Water Quality Monitoring Plan to assess and mitigate potential impacts of construction activities on nearby waterbodies.
- Prior to construction, SCE will prepare a Dewatering and Diversion Plan which details strategies and procedures for managing water during construction activities.
- SCE will maintain minimum instream flow downstream of construction sites.
- Prior to construction, SCE will prepare an Erosion Control Plan that covers all disturbed areas, including staging, stockpile, and fueling areas.
- Prior to construction, SCE will prepare a Stormwater Pollution Prevention Plan that covers all construction sites.
- Construction of embankment structures around constructed areas to redirect storm water runoff so that it is temporarily detained in a catchment basin, to allow sediment to settle out before water is discharged.
- Construction activities will be completed during minimal runoff periods (i.e., during the dry season or when rain and runoff are unlikely, typically during the late summer or fall) when flows are more manageable.
- Ground disturbance will primarily take place in the dry, stable, contained lakebed.
- Work areas will be returned to pre-construction grades and stabilized using compaction or natural degradable materials.
- Soil stabilization and erosion control best management practices will be implemented to minimize soil erosion resulting from Project facility modifications.

- Stabilize unpaved areas subject to vehicle traffic by watering, treating with a non-toxic chemical dust suppressant, or covering.
- Stabilize storage piles and disturbed areas not subject to vehicular traffic by keeping wet, treating with a non-toxic chemical dust suppressant, or covering when material is not being added to, or removed from, the pile.
- Prior to any ground disturbance, including grading, excavating, and land clearing, apply sufficient water to the area to be disturbed to limit dust and minimize emissions.
- Suspend grading and earthmoving operations if wind speeds are high enough to result in dust emissions, despite the application of dust mitigation measures.
- Establish designated areas for equipment staging and parking to minimize the area of ground disturbance.
- Establish and maintain construction area limits to the minimum area necessary for completing the project and confine disturbance to within this area.
- Install sediment and stormwater controls before initiating surface-disturbing activities to the extent practicable.
- Routinely inspect disturbed areas to verify that erosion and stormwater controls are implemented and functioning as designed and are suitably maintained.
- Operate equipment only when soil compaction, displacement, erosion, and sediment runoff would be minimized.
- To the extent feasible, minimize traffic along the downstream portion of the lakebed.
- Temporary structures should be placed in a manner to minimize ground disturbance.
- During construction activities, SCE will implement applicable United States Forest Service water quality best management practices identified in *National Best Management Practices for Water Quality Management on National Forest System Lands* (Forest Service 2012). See below for a preliminary list of Forest Service best management practices that may be applicable to Project facility modifications.

## UNITED STATES FOREST SERVICE WATER QUALITY BEST MANAGEMENT PRACTICES

### AQUATIC ECOSYSTEMS MANAGEMENT ACTIVITIES

### AqEco-2. Operations in Aquatic Ecosystems

- Coordinate stream channel, shoreline, lake, pond, and wetland activities with appropriate State and Federal agencies.
- Use suitable measures to protect the waterbody when preparing the site for construction or maintenance activities.
  - Clearly delineate the work zone.
  - Refuel and service equipment only in designated staging areas.
  - Develop an erosion and sediment control plan to avoid or minimize downstream impacts using measures appropriate to the site and the proposed activity.
  - Ensure all equipment operated in or adjacent to the waterbody is clean of aquatic invasive species, as well as oil and grease, and is well maintained.
- Schedule construction or maintenance operations in waterbodies to occur in the least critical periods to avoid or minimize adverse effects to sensitive aquatic and aquatic-dependent species that live in or near the waterbody.
  - Avoid scheduling instream work during the spawning or migration seasons of resident or migratory fish and other important life history phases of sensitive species that could be affected by the project.
  - Avoid scheduling instream work during periods that could be interrupted by high flows.
- Use suitable measures to protect the waterbody when clearing the site.
  - Clearly delineate the geographic limits of the area to be cleared.
  - Use suitable drainage measures to improve the workability of wet sites.
  - Avoid or minimize unacceptable damage to existing vegetation, especially plants that are stabilizing the bank of the waterbody.
- Use suitable measures to avoid or minimize impacts to the waterbody when implementing construction and maintenance activities.
  - Minimize heavy equipment entry into or crossing water as is practicable.
  - Stage construction operations as needed to limit the extent of disturbed areas without installed stabilization measures.
  - Promptly install and appropriately maintain erosion control measures.
  - Promptly install and appropriately maintain spill prevention and containment measures.

   - Promptly rehabilitate or stabilize disturbed areas as needed following construction or maintenance activities.
   - Stockpile and protect topsoil for reuse in site vegetation.
   - Minimize bank and riparian area excavation during construction to the extent practicable.
   - Keep excavated materials out of the waterbody.
   - Use only clean, suitable materials that are free of toxins and invasive species for fill.
   - Properly compact fills to avoid or minimize erosion.
   - Balance cuts and fills to minimize disposal needs.
   - Remove all project debris from the waterbody in a manner that will cause the least disturbance.
   - Identify suitable areas offsite or away from waterbodies for disposal sites before beginning operations.
   - Contour site to disperse runoff, minimize erosion, stabilize slopes, and provide a favorable environment for plant growth.
   - Use suitable species and establishment techniques to revegetate the site in compliance with local direction and requirements per FSM 2070 and FSM 2080 for vegetation ecology and prevention and control of invasive species.
- Use suitable measures to divert or partition channelized flow around the site or to dewater the site as needed to the extent practicable.
   - Remove aquatic organisms from the construction area before dewatering and prevent organisms from returning to the site during construction.
   - Return clean flows to channel or waterbody downstream of the activity.
   - Restore flows to their natural stream course as soon as practicable after construction or before seasonal closures.
- Inspect the work site at suitable regular intervals during and after construction or maintenance activities to check on quality of the work and materials and identify need for mid-project corrections.
- Include implementation and effectiveness monitoring to evaluate success of the project in meeting design objectives and avoiding or minimizing unacceptable impacts to water quality.
- Consider long-term management of the site and nearby areas to promote project success.
   - Use suitable measures to limit human, vehicle, and livestock access to site as needed to allow for recovery of vegetation.

## Facilities and Non-recreation Special Uses Management Activities

### Fac-2. Facility Construction and Stormwater Control

- Establish designated areas for equipment staging, stockpiling materials, and parking to minimize the area of ground disturbance.
- Establish and maintain construction area limits to the minimum area necessary for completing the project and confine disturbance to within this area.
- Develop and implement an erosion control and sediment plan that covers all disturbed areas, including borrow, stockpile, fueling, and staging areas used during construction activities.
- Install sediment and stormwater controls before initiating surface-disturbing activities to the extent practicable.
- Routinely inspect construction sites to verify that erosion and stormwater controls are implemented and functioning as designed and are appropriately maintained.

### Fac-4. Sanitation Systems

- Use qualified personnel to locate, design, inspect, operate, maintain, and manage sanitation systems.
- Prepare and maintain an operation and maintenance plan for all waste treatment or disposal facilities.

### Fac-5. Solid Waste Management

- Dispose of collected garbage at properly designed and operated municipal-, county-, or State-authorized sanitary landfills or waste recycling sites where groundwater and surface water are adequately protected.
- Obtain necessary State or local permits for solid waste disposal sites.

### Fac-6. Hazardous Materials

- Ensure that all employees involved in the use, storage, transportation, and disposal of hazardous materials receive proper training.
- Manage the use, storage, discharge, or disposal of pollutants and hazardous or toxic substances generated by the project in compliance with applicable regulations and requirements.
- Prepare a certified Spill Prevention Control and Countermeasures Plan for each construction site.
- Respond to hazardous materials releases or spills using the established site-specific contingency plan for incidental releases and the Emergency Response Plan for larger releases.
- Ensure that hazardous spill kits are adequately stocked with necessary supplies and are maintained in accessible locations.

### Fac-10. Facility Site Reclamation

- Develop and implement a reclamation plan to rehabilitate and restore, to the extent practicable, the natural ecological components, structures, and processes consistent with land management plan desired conditions, goals, and objectives at sites where structures or facilities have been permanently removed.

## RECREATION MANAGEMENT ACTIVITIES

### Rec-6. Pack and Riding Stock Use Areas

- Install simple temporary holding facilities in both wilderness and non-wilderness areas.
- Designate specific watering locations on streams, ponds, and lakes to avoid or minimize general use along streambanks or shorelines.
- Provide designated watering areas at developed stock use areas where practicable.
- Provide manure disposal bins at developed pack and riding stock use areas.
- Monitor pack and riding stock use areas at regular intervals to identify drainage and ground surface maintenance needs to avoid, minimize, or mitigate adverse effects to soil, water quality, and riparian resources.
- Manage pack and riding stock use areas to mitigate adverse effects to soil, water quality, and riparian resources.

## ROAD MANAGEMENT ACTIVITIES

### Road-5. Stream Crossings

- Locate stream crossings where the channel is narrow, straight, and uniform, and has stable soils and relatively flat terrain to the extent practicable.
- Design the crossing to pass a normal range of flows for the site.

### Road-9. Parking and Staging Areas

- Design and locate parking and staging areas of appropriate size and configuration to accommodate expected vehicles and avoid or minimize adverse effects to adjacent soil, water quality, and riparian resources.
- Use suitable measures to harden and avoid or minimize damage to parking area surfaces that experience heavy use or are used during wet periods.
- Use and maintain suitable measures to collect and contain oil and grease in larger parking lots with high use and where drainage discharges directly to streams.

- Conduct maintenance activities commensurate with parking or staging area surfacing and drainage requirements as well as precipitation timing, intensity, and duration.
- Limit the size and extent of temporary parking or staging areas.

**Road-10. Equipment Refueling and Servicing**

- Develop or use existing fuel and chemical management plans (e.g., Spill Prevention Control and Countermeasures, spill response plan, and emergency response plan) when developing the management prescription for refueling and servicing sites.
- Locate, design, construct, and maintain petroleum and chemical delivery and storage facilities consistent with applicable local, State, and Federal regulations.
- Use suitable measures around vehicle service, storage and refueling areas, chemical storage and use areas, and waste dumps to fully contain spills and avoid or minimize soil contamination and seepage to groundwater.
- Provide training for all agency personnel handling fuels and chemicals in their proper use, handling, storage, and disposal.
- Use suitable measures to avoid spilling fuels, lubricants, cleaners, and other chemicals during handling and transporting.
- Prohibit excess chemicals or wastes from being stored or accumulated in the project area.
- Remove service residues, used oil, and other hazardous or undesirable materials from NFS land and properly dispose them as needed during and after completion of the project.
- Clean up and dispose of spilled materials according to specified requirements in the appropriate guiding document.
- Report spills and initiate suitable cleanup action in accordance with applicable State and Federal laws, rules, and regulations.

# APPENDIX 5-C

## Environmental Measures, Management, and Monitoring Plans

# APPENDIX 5-C NEW ENVIRONMENTAL MEASURES, MANAGEMENT AND MONITORING PLANS

Appendix 5-C contains a description of environmental measures, management, and monitoring plans (environmental measures) that Southern California Edison Company (SCE) proposes to implement under the Proposed Action for the Rush Creek Project (Project). The environmental measures are designed to protect, maintain, or enhance environmental and cultural resources over the term of the new license. The environmental measures included in the Proposed Action, by resource area, are documented in the following:

- Aquatic Resources
  - Minimum Instream Flow Measure
  - Recreation Reservoir Elevation Objectives Measure
  - Stream and Reservoir Gaging Monitoring Plan
  - Fish Stocking Measure
- Cultural Resources
  - Historic Properties Management Plan
- Terrestrial Resources
  - Vegetation Management Measure

## AQUATIC RESOURCES

### MEASURE 1: MINIMUM INSTREAM FLOW MEASURE

The Licensee will maintain a continuous minimum flow of 1 cubic foot per second (cfs) (or natural inflow[1] if the level of Gem Lake falls below the face of the dam) in Rush Creek below Gem Dam (USGS Gage 10287281; SCE 352 R) and 1 cfs (or natural inflow if the level of Gem Lake falls below the face of the dam) below Agnew Lake (natural lake) at the flume gage (USGS 10287289; SCE 357).

The Licensee may temporarily modify minimum instream flows if required by operating emergencies beyond the control of the Licensee. The Licensee may also modify minimum instream flows for short periods upon written consent of the Forest Service.

### MEASURE 2: RECREATION RESERVOIR ELEVATION OBJECTIVES MEASURE

Following retrofitting of Gem Dam, the Licensee will operate Gem Lake during the July through Labor Day weekend season to meet the primary hydropower generation purpose of the reservoir. The Licensee will also support reservoir-based recreation by making every reasonable effort to achieve the following water surface objectives as determined by the April 1 snow water equivalent at Agnew Pass:

| April 1 Snow Water Equivalent Percent at Agnew Pass[1] | Gem Lake Elevation Objectives, Elevation from the Spillway (feet) | Date |
|---|---|---|
| >100% | 5 | August 1 through the Tuesday after Labor Day weekend |
| 75-100% | 5 | July 1 through the Tuesday after Labor Day weekend |
| 40-<75% | 10 | July 1 through the Tuesday after Labor Day weekend |
| <40% | 15 | July 1 through the Tuesday after Labor Day weekend |

Note:

[1] Agnew Pass snow water equivalent is located at site AGP – Agnew Pass on the California Data Exchange Center. In the event snow water equivalent data is not available at Agnew Pass, an alternate site such as GEM – Gem Pass may be used.

[1] Natural inflow if natural inflow is less than the specified minimum flow. The bottom of the dam face and low-level outlet pipe invert is approximately 8,983.88 feet elevation.

### MEASURE 3: STREAM AND RESERVOIR GAGING MONITORING PLAN

The purpose of the Stream and Reservoir Gaging Monitoring Plan (SRGMP) is to describe:

- Project gages used to document compliance with minimum instream flow and reservoir levels;
- Operation and maintenance of the gages; and
- Reporting of compliance.

**Compliance Gages**

The gages used to document compliance with minimum instream flow and reservoir level requirements are identified in Table SRGMP-1.

**Operations and Maintenance of Gages**

All the gages will record at a time increment of ≤15 minutes. The gages will be maintained and operated by the Licensee. The Licensee will implement current USGS gaging standards for the type of measurement system specific to each location (e.g., bubble gage, acoustic Doppler current profiler, acoustic velocity meter).

**Reporting**

The Licensee will prepare a brief annual report to document compliance with minimum instream flow and reservoir levels for each calendar year. The annual report will be filed with Federal Energy Regulatory Commission (FERC) within the first quarter of each year. Upon completion of the QA/QC process and upon request, flow data will be provided to FERC, State Water Board, and California Department of Fish and Wildlife (CDFW).

If a deviation occurs regarding compliance with minimum instream flow and reservoir level requirements, the Licensee will file a report with the FERC within 30 days from the date that the data becomes available indicating the deviation. The report will, to the extent possible, identify the cause, severity, and duration of the deviation, any environmental impacts resulting from the deviation, a description of the measures implemented to correct the deviation, and the measures the Licensee implemented or proposes to ensure deviations do not recur.

### Table SRGMP-1. Summary of Rush Creek Project Gages

| Gage Name | SCE Gage Number | USGS Gage Number | Latitude/ Longitude (NAD27) | Description |
|---|---|---|---|---|
| Rush Creek Powerhouse | 367 | 10287300 | 37°45'59" 119°07'17" | Located on the west wall side of the powerhouse and records flow through the powerhouse. |
| Rush Creek Below Rush Meadows Dam | 359R | 10287262 | 37°45'04" 119°10'50" | Stream gage located approximately 160 feet downstream of Rush Meadows Dam. Gage measures the storage releases from Rush Meadows Dam that travel down Rush Creek into Gem Lake. |
| Rush Creek below Agnew Lake | 357 | 10287289 | 37°45'33" 119°07'47" | Stream Gage located approximately 600 feet downstream of Agnew Dam at the Project flume. |
| Rush Creek below Gem Dam | 352R | 10287281 | 37°45'05" 119°08'26" | A minimum flow gage is located downstream of Gem Dam, but it does not capture reservoir spills. |
| Gem Lake | 352 | 10287280 | 37°45'07" 119°08'25" | Reservoir gage located at the Gem Valve House. |

#### MEASURE 4: FISH STOCKING MEASURE

The purpose of the Fish Stocking Measure is to continue the Licensee’s off-site fish stocking commitment approved by FERC under the existing license (Article 405). The Licensee will stock rainbow trout into an off-site location, to be determined in consultation with CDFW, to offset potential fish entrainment in the Rush Creek Project hydroelectric facilities.

The Licensee will implement the following as part of this measure:

- Consult with CDFW every five years following license issuance to confirm stocking schedule and location.
- Obtain and release 1,000 catchable-sized (0.5 to 1.0 pound each) or equivalent rainbow trout at a location approved by CDFW.
  - Fish will be transported to the release site by a licensed vendor. The Licensee will release the stocked fish following proper fish-handling procedures and protocols.
- Submit a Report of Fish Stocking to FERC and CDFW within 30 days after release of fish.

## CULTURAL RESOURCES

### MEASURE 5: HISTORIC PROPERTIES MANAGEMENT PLAN (TO BE DEVELOPED)

In 2023 and 2024, SCE conducted cultural resource studies, including built environment (CUL 1), archaeological (CUL 2), and Tribal resources (TRI 1) within the Rush Creek Area of Potential Effects and study area. SCE currently implements a Historic and Archaeological Protection Plan and intends to develop a Historic Properties Management Plan (HPMP) that will consider the direct and indirect effects to National Register of Historic Places listed or eligible resources from continued Project operation and maintenance. The HPMP will incorporate results from cultural resource studies conducted for relicensing as well as concurrence on eligibility received from the State Historic Preservation Officer (SHPO). The HPMP will be developed in consultation with the Inyo National Forest, SHPO, and Native American Tribes and will outline implementation procedures such as management roles and responsibilities, Native American and agency consultation, project review requirements, implementation protocols including annual meetings and reporting, as well processes for revision of the HPMP and dispute resolution. The HPMP will be utilized as a management tool to avoid potential adverse effects to historic properties.

Any Finding of *Adverse Effect* identified through the review of the Proposed Action will follow the Section 106 process pursuant to 36 Code of Federal Regulations (CFR) Part 800.5 *assessment of adverse effects* and 800.6 *resolution of adverse effects*. Resolution of an adverse effect, as defined in 36 CFR Part 800.6, requires notifying the ACHP; consulting with the SHPO, interested parties and land managing agencies; and developing a Memorandum of Agreement that outlines how adverse effect will be resolved.

## TERRESTRIAL RESOURCES

### MEASURE 6: VEGETATION MANAGEMENT MEASURE

The Licensee will implement the Vegetation Management Measure which provides for protection of whitebark pine (*pinus albicaulis*) during vegetation maintenance activities and establishes measures to minimize the introduction or spread of non-native invasive plant species (NNIP).

#### Whitebark Pine

<u>Environmental Awareness Training</u>

- The Licensee currently implements an Environmental Training Program to educate personnel and contractors (as appropriate) about special-status biological species, avian protection, nesting birds, and cultural resources in the vicinity of the Project. Whitebark pine will be added to the program as a special-status biological species. The Environmental Training Program will continue to be administered annually.

Whitebark Pine Surveys

- Surveys will be conducted to map the location of whitebark pines in areas where vegetation management activities are implemented every 5 years following license issuance. Refer to Section 4.4.6, Vegetation Management, for the areas where vegetation management is implemented around Project facilities.
- Surveys will be conducted in accordance with methods described in the TERR 1 – Botanical Resources Technical Study Report (TSR).

Whitebark Pine Protection

- Prior to implementation of vegetation management activities, whitebark pine populations/individuals will be flagged for avoidance.
- No trimming or removal of whitebark pine will be implemented as part of the Project.
- If it is determined that trimming or removal of a whitebark pine is necessary, the Licensee will consult with the United States Fish and Wildlife Service to obtain authorization.

**Non-Native Invasive Plants**

Non-Native Invasive Plant Training Program

- The Licensee will develop an NNIP training program for Project personnel and contractors. The NNIP training program will include photographs, descriptions, and other materials to assist personnel and contractors in identifying weed species listed in the TERR 1 – Botanical Resources TSR, Table TERR 1-3 (non-native invasive plant species identified in the study area). It will also include a review of measures to control or prevent the introduction and spread of noxious weeds (see below).

Measures to Prevent the Introduction or Spread of Noxious Weeds

- Stockpiling: Stockpiles of gravel and soil will be maintained in a weed-free state.
- Clothing and Boots: Workers will inspect, remove, and properly dispose of readily observable weed seeds and plant parts found on their clothing and equipment. Proper disposal includes bagging the seeds and plant parts prior to disposal.
- Erosion Control: Certified weed-free hay, mulch, or straw will be used for erosion control. If certified weed-free straw is not available, certified weed-free rice straw will be used. If weed-free material is not available, the Licensee will consult with the Forest Service botanist regarding other options (e.g., sterilized straw pellets).

## TABLE OF CONTENTS

Page

6.0 Other Alternatives ........................................ 6-1
6.1 Alternatives Considered but Eliminated from Detailed Study ........ 6-1
6.1.1 Federal Government Takeover ........................ 6-1
6.1.2 Issuing a Non-power License ........................ 6-2
6.1.3 Project Decommissioning ............................ 6-2
6.2 References ................................................ 6-2

## LIST OF ACRONYMS

| | |
|---|---|
| DEC 1 Study | DEC 1 – Full Decommissioning Study |
| FERC | Federal Energy Regulatory Commission |
| Project | Rush Creek Project |
| SCE | Southern California Edison Company |

# 6.0 OTHER ALTERNATIVES

In the Federal Energy Regulatory Commission's (FERC) Scoping Document 2 for the Rush Creek Project (Project) (FERC 2022a), FERC proposed to eliminate the following alternatives from detailed study in its National Environmental Policy Act document: (1) Federal Government Takeover, (2) Non-power License, and (3) Project Decommissioning. Subsequently, as part of the study plan determination process, and based on information filed by the United States Forest Service in October 2022 (Forest Service 2022), FERC determined that "project decommissioning is at least foreseeable such that a decommissioning alternative should be studied" (FERC 2022b). In its Study Plan Determination, FERC recommended that Southern California Edison Company (SCE) conduct a study to evaluate the effects of decommissioning the Project.

In accordance with FERC's recommendation, SCE prepared the DEC 1 – Full Project Decommissioning Study (DEC 1 Study; SCE 2024), which describes options for decommissioning the Project, including options to remove all Project facilities or leave all/some in place; possible flow and water level changes that may occur under each option; describes types and quantities of accumulated sediment that would be released from behind each dam, including the presence of any known contaminants that could be released downstream; description of potential physical and environmental benefits and concerns associated with each option; and cost estimates. The Draft DEC 1 Study (Phase I) is provided in Supporting Document A of this License Application.

While SCE prepared the DEC 1 Study at the request of FERC, at this time, it is SCE's intention to relicense the Project and continue operation and maintenance of a modified Project, as described in Section 5, Proposed Action. Based on information presented in the DEC 1 Study, SCE eliminated Project decommissioning from detailed analysis in this License Application because it (1) does not meet SCE's objective to relicensing the Project allowing it to continue to provide renewable energy to California's electric grid; (2) removes a local power source potentially increasing the frequency of outage events and customer disruption; and (3) results in longer construction duration and effects to residents and visitors to the area (e.g., noise, traffic, trail closures).

There are two alternatives analyzed in this License Application, including the No-Action Alternative and the Proposed Action Alternative. The following section describes alternatives that were considered but eliminated from detailed study.

## 6.1 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED STUDY

### 6.1.1 Federal Government Takeover

In accordance with § 16.14 of the FERC's regulations, a federal department or agency may file a recommendation that the United States exercise its right to take over a hydroelectric power project with a license that is subject to Sections 14 and 15 of the Federal Power Act.[1] Federal takeover and operation of the Project would require Congressional approval. While that fact alone would not preclude further consideration of this alternative, there is no

[1] 16 United States Code §§ 807–808; 18 Code of Federal Regulations § 16.14.

evidence to indicate that federal takeover should be recommended to Congress. No party has suggested federal takeover would be appropriate, and no federal agency has expressed an interest in operating the Project. Therefore, this alternative is deemed unreasonable and eliminated from further detailed study.

### 6.1.2 Issuing a Non-power License

A non-power license is a temporary license that FERC would terminate if it determined that another government agency is authorized and willing to assume authority and supervision over the lands and facilities covered by the non-power license. There is no evidence that a government agency has suggested a desire or ability to take over the Project. No other party has sought a non-power license. Further, the Project facilities are fully capable of continuing to generate power under the ownership, management, and oversight of SCE. Therefore, this alternative is deemed unreasonable, and eliminated from further detailed study.

### 6.1.3 Project Decommissioning

Project decommissioning requires that FERC deny SCE's License Application and requires surrender and termination of the existing license along with implementation of any associated conditions. The Project would no longer be authorized to generate power. SCE is not proposing to decommission the Project, and the record to date does not demonstrate any serious resource concerns that cannot be mitigated if the Project is relicensed. Therefore, this alternative is deemed unreasonable and eliminated from further detailed study.

## 6.2 References

FERC (Federal Energy Regulatory Commission). 2022a. Scoping Document 2 for the Rush Creek Hydroelectric Project. May 27.

_____. 2022b. Study Plan Determination. October 26.

SCE (Southern California Edison Company). 2024. DEC 1 – Full Project Decommissioning Study. August. Available in Supporting Document A of the Application for New License.

## TABLE OF CONTENTS

Page

7.0 Statutory and Regulatory Requirements ........ 7-1
7.1 Federal Power Act ........ 7-1
7.1.1 Section 4(e) Conditions ........ 7-1
7.1.2 Section 10(j) Recommendations ........ 7-1
7.1.3 Section 18 Fishway Prescriptions ........ 7-1
7.2 Clean Water Act – Section 401 ........ 7-1
7.3 Endangered Species Act – Section 7 ........ 7-2
7.4 Magnuson-Stevens Fishery Conservation and Management Act ........ 7-2
7.5 Coastal Zone Management Act ........ 7-2
7.6 National Historic Preservation Act – Section 106 ........ 7-3
7.7 Wild and Scenic Rivers Act ........ 7-3
7.8 Other Regulatory Requirements ........ 7-4
7.8.1 Wilderness Act ........ 7-4
7.9 References ........ 7-5

## LIST OF ACRONYMS

| | |
|---|---|
| CFR | Code of Federal Regulations |
| CWA | Clean Water Act |
| CZMA | Coastal Zone Management Act |
| ESA | Endangered Species Act |
| FERC | Federal Energy Regulatory Commission |
| Forest Service | United States Forest Service |
| FPA | Federal Power Act |
| NHPA | National Historic Preservation Act |
| Project | Rush Creek Project |
| SCE | Southern California Edison Company |

# 7.0 STATUTORY AND REGULATORY REQUIREMENTS

The Federal Energy Regulatory Commission (FERC) license for the Rush Creek Project (Project) is subject to requirements under the Federal Power Act (FPA) and other applicable statutes. In accordance with Title 18 of the Code of Federal Regulations (CFR) § 5.18(b)(3), this section briefly describes the statutory and regulatory requirements that must be addressed as part of the relicensing process.

## 7.1 FEDERAL POWER ACT

FERC is the lead federal agency for regulating the licensing of the Project and evaluating the Proposed Action as outlined in the License Application. The FPA gives FERC legal authority to issue licenses to non-federal hydropower projects. The following sections of the FPA are applicable to the Project. Following FERC's issuance of the Notice of Acceptance and Notice of Ready for Environmental Analysis, FERC will request that resource agencies provide conditions and recommendations related to the following FPA sections.

### 7.1.1 Section 4(e) Conditions

Section 4(e) of the FPA provides that any license issued by FERC for a project within a federal reservation shall be subject to and contain conditions as the Secretary of the responsible federal land management agency deems necessary for the adequate protection and use of the reservation. The United States Forest Service (Forest Service) is the primary federal land manager for much of the Project area.

### 7.1.2 Section 10(j) Recommendations

Under section 10(j) of the FPA, each hydroelectric license issued by FERC must include conditions based upon recommendations provided by federal and state fish and wildlife agencies for the protection, mitigation, and enhancement of fish and wildlife resources affected by the project. FERC is required to include these conditions unless it determines that they are inconsistent with the purposes and requirements of the FPA or other applicable law. Before rejecting or modifying an agency recommendation, FERC is required to attempt to resolve any such inconsistency with the agency, giving due weight to the recommendations, expertise, and statutory responsibilities of such agency.

### 7.1.3 Section 18 Fishway Prescriptions

Section 18 of the FPA states that the FERC is to require construction, operation, and maintenance by a licensee of such fishways as may be prescribed by the Secretaries of Commerce or the Interior.

## 7.2 CLEAN WATER ACT – SECTION 401

Under Section 401(a)(1) of the Clean Water Act (CWA), an applicant for a federal permit or license for any activity that may result in a discharge to a water body must request a water quality certification from the appropriate state pollution control agency verifying compliance with the CWA. The California State Water Resources Control Board was designated by the United States Environmental Protection Agency as the water pollution control agency with authority to implement the Clean Water Act in California. In accordance with 18 CFR § 5.23, Southern California Edison Company (SCE) will request a water quality certification, including proof of the date on which the certifying agency received the request, no later than 60 days following FERC's issuance of the Notice of Acceptance and Notice of Ready for Environmental Analysis.

## 7.3 ENDANGERED SPECIES ACT – SECTION 7

Section 7 of the Endangered Species Act (ESA) requires federal agencies to ensure that their actions are not likely to jeopardize the continued existence of endangered or threatened species or result in the destruction or adverse modification of the critical habitat of such species.

On December 16, 2021, as part of its Pre-Application Document filing and pursuant to 18 CFR § 5.5(e), SCE requested to be designated as FERC's non-federal representative in relicensing the Project for the purposes of consultation under Section 7 of the ESA. FERC approved this request on February 14, 2022 as part of its Notice of Commencing of Pre-Filing Process. Refer to Section 13, Consultation Documentation for a description of ESA Section 7 consultation completed for the Project. A Draft Biological Assessment will be filed with the Final License Application.

## 7.4 MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT

The Magnuson-Stevens Fishery Conservation and Management Act governs fisheries management in the United States, including the designation of essential fish habitat. The National Marine Fisheries Service has not identified any essential fish habitat within the vicinity of the Project. Therefore, the Magnuson-Stevens Fishery Conservation and Management Act does not apply to the Project.

## 7.5 COASTAL ZONE MANAGEMENT ACT

Under Section 307 (c)(3)(A) of the Coastal Zone Management Act (CZMA), FERC cannot issue a license for a project within or affecting a states' coastal zone unless the state CZMA agency concurs with the license applicant's certification of consistency with the state's CZMA program, or the agency's concurrence is conclusively presumed by its failure to act within 180 days of its receipt of the applicant's certification. The California Coastal Commission is the agency responsible for implementing California's coastal management program.

The Project is not located within the state-designated Coastal Management Zone and the Project would not affect California's coastal resources. Therefore, the Project is not subject to coastal zone program review and no consistency certification is needed for the action. On March 11, 2024, SCE requested concurrence from the California Coastal Commission that the Project is not included within and does not affect California's coastal zone or resources. A letter of concurrence from the Coastal Zone Program Officer is pending and will be filed with the Final License Application.

## 7.6 NATIONAL HISTORIC PRESERVATION ACT – SECTION 106

Section 106 of the National Historic Preservation Act (NHPA) of 1966 requires that every federal agency "take into account" how each of its undertakings could affect historic properties. Historic properties are districts, sites, buildings, structures, traditional cultural properties, and objects significant in American history, architecture, engineering, and culture that are eligible for inclusion in the National Register of Historic Places.

On December 16, 2021, as part of its Pre-Application Document filing and pursuant to 18 CFR § 5.5(e), SCE requested to be designated as FERC's non-federal representative in relicensing the Project for the purposes of consultation under Section 106 of the NHPA and its implementing regulations. FERC approved this request on February 14, 2022, as part of its Notice of Commencing of Pre-Filing Process. Refer to Section 13, Consultation Documentation for a description of NHPA Section 106 consultation completed for the Project.

## 7.7 WILD AND SCENIC RIVERS ACT

Section 7(a) of the Wild and Scenic Rivers Act requires federal agencies to make a determination as to whether the operation of a project under a new license will invade the area or unreasonably diminish the scenic, recreational, and fish and wildlife values present in a designated river corridor.[1]

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 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[2], 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.

[1] 16 United States Code § 1278(a)
[2] 36 CFR 219.7(c)(2)(vi)

## 7.8 OTHER REGULATORY REQUIREMENTS

### 7.8.1 Wilderness Act

Section 4(c) of the Wilderness Act of 1964, 16 United States Code § 1133(c), prohibits any commercial enterprise, structure, or installation within designated wilderness areas, except for “existing private rights” or activities authorized by the President. Similarly, the California Wilderness Act of 1984 subjects congressionally designated wilderness areas to “valid existing rights.” Application of common canons of statutory construction, as well as the Forest Service Manual, establish that “existing private rights” that were in place as of the date that Congress statutorily created the specific wilderness area in question are not subject to the prohibitions of the Wilderness Act.

A portion of the Project (Rush Meadows Dam, Waugh Lake, and Gem Lake) is located within the Ansel Adams Wilderness Area. Ansel Adams Wilderness Area was originally established by Congress as part of the original Wilderness Act in 1964. At the time, it was designated as the Minarets Wilderness. In 1984, after Ansel Adams’ death, the area was renamed in his memory. The Ansel Adams Wilderness is administered by the Inyo and Sierra National Forests.

Northeast of Agnew Dam, a 135-foot-long section of the 4-kilovolt Agnew Distribution Line, that provides power to Project facilities, crosses (aerial cable) the Owens River Headwaters Wilderness Area; however, no poles/towers are located within the wilderness area. The Owens River Headwaters Wilderness was established as part of the Omnibus Public Lands Management Act on March 31, 2009.

The Project was licensed, constructed, and developed prior to Congress’ enactment of the Wilderness Act and designation of Ansel Adams Wilderness Area in 1964. FERC’s predecessor agency, the Federal Power Commission, issued an original license for the Project to the Nevada-California Electric Corporation (SCE’s predecessor) in 1939.

Because the original licensing of the Project in 1939 predated Congress’ establishment of these wilderness areas, the Project is exempt from the development prohibitions of the Wilderness Act. In fact, the FERC relicensed this project in 1997—decades after Congress had originally established the Minarets Wilderness. In that prior relicensing, the Forest Service raised no objection to FERC’s relicensing of the Project.

Accordingly, FERC is not prohibited from relicensing the Project. Moreover, FERC’s relicensing of the Project would not be inconsistent with the Wilderness Act, again, as Congress has expressly exempted “existing private rights” from the development prohibitions of the Act. In addition, consistent with FERC precedent, SCE’s relicensing application does not seek construction of any new Project works within Ansel Adams Wilderness Area; however, does seek to remove Rush Meadows Dam, and in fact SCE proposes to remove most of the Project infrastructure within Congressionally designated wilderness.

## 7.9 REFERENCES


Forest Service (United States Forest Service). 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.

NPS (National Park Service). 2021. Nationwide Rivers Inventory. Available at: https://www.nps.gov/subjects/rivers/nationwide-rivers-inventory.htm.

## Table of Contents

Page

8.0 Affected Environment ........................................................................................ 8-1
8.1 References ........................................................................................ 8-2

## List of Acronyms

| | |
|---|---|
| FERC | Federal Energy Regulatory Commission |

# 8.0 AFFECTED ENVIRONMENT

This section follows the Federal Energy Regulatory Commission's (FERC) content requirements at Title 18 of the Code of Federal Regulations § 5.18(b)(5)(ii)(A) which specify that, "the applicant must provide a detailed description of the affected environment or area(s) to be affected by the proposed project by each resource area. This description must include the information on the affected environment filed in the Pre-Application Document provided for in § 5.6, developed under the applicant's approved study plan, and otherwise developed or obtained by the applicant. The section must include a general description of socio-economic conditions in the vicinity of the project including general land use patterns (e.g., urban, agricultural, forested), population patterns, and sources of employment in the project vicinity." In addition, as required under § 5.18(b), this section follows the FERC's "Preparing Environmental Documents: Guidelines for Applicants, Contractors, and Staff" (FERC 2008).

The affected environment was developed from information included in Southern California Edison Company's Pre-Application Document and collected during implementation of 17 FERC-approved Technical Study Plans developed for the relicensing of the Rush Creek Project. Results of these studies are provided in Technical Study Reports included in Supporting Document A of this Application for New License. The affected environment descriptions identify existing resource conditions under current operations and maintenance of the Rush Creek Project (baseline conditions).

This section is organized as follows:

- 8.1 – General Description of the River Basin
- 8.2 – Water Use and Hydrology
- 8.3 – Water Quality
- 8.4 – Fish and Aquatics
- 8.5 – Botanical and Wildlife
- 8.6 – Geology and Soils
- 8.7 – Geomorphology
- 8.8 – Wetland, Riparian, and Littoral Habitats
- 8.9 – Land Use
- 8.10 – Recreation
- 8.11 – Aesthetics
- 8.12 – Cultural

- 8.13 – Tribal
- 8.14 – Socioeconomics
- 8.15 – Air Quality
- 8.16 – Noise
- 8.17 – Traffic

## 8.1 REFERENCES

FERC (Federal Energy Regulatory Commission). 2008. Preparing Environmental Documents: Guidelines for Applicants, Contractors, and Staff. Office of Energy Projects Division of Hydropower Licensing. September.

## Table of Contents

Page

8.1 General Description of the Rush Creek Basin ... 8.1-1
8.1.1 Information Sources ... 8.1-1
8.1.2 General Overview ... 8.1-1
8.1.3 Climate and Hydrology ... 8.1-2
8.1.4 Drainage Area, Sub-basin Area, and Stream Reach Lengths ... 8.1-2
8.1.5 Major Land Uses and Economy in the Project Area ... 8.1-3
8.1.6 Dams and Diversions ... 8.1-4
8.1.7 Tributary Rivers and Streams Affected by the Project ... 8.1-5
8.1.8 References ... 8.1-5

## List of Tables

Table 8.1-1. Monthly Average Air Temperature and Rainfall at Rush Creek Powerhouse (CDEC Station RSH) – All Available Years ... 8.1-7

Table 8.1-2. Snow Courses and Meteorological Stations Located in the Vicinity of the Rush Creek Project ... 8.1-8

Table 8.1-3. Information on Drainage Area of the Rush Creek Basin and Sub-basins (see Map 8.1-1) ... 8.1-9

Table 8.1-4. Stream Reaches ... 8.1-10

## List of Figures

Figure 8.1-1. Annual Inflow to the Rush Creek Project (Water Year 1990–2023) ... 8.1-12

## LIST OF MAPS

Map 8.1-1. Rush Creek Basin and Sub-basins ............................................... 8.1-14

Map 8.1-2a. Rush Creek Stream Reaches and River Miles .............................. 8.1-15

Map 8.1-2b. Rush Creek Stream Reaches and River Miles .............................. 8.1-16

Map 8.1-2c. Rush Creek Stream Reaches and River Miles .............................. 8.1-17

Map 8.1-2d. Rush Creek Stream Reaches and River Miles .............................. 8.1-18

Map 8.1-2e. Rush Creek Stream Reaches and River Miles .............................. 8.1-19

Map 8.1-2f. Rush Creek Stream Reaches and River Miles .............................. 8.1-20

Map 8.1-2g. Rush Creek Stream Reaches and River Miles .............................. 8.1-21

Map 8.1-3. Land Jurisdictions in the Vicinity of the Rush Creek Project ......... 8.1-22

## LIST OF ACRONYMS

| | |
|---|---|
| ac-ft | acre-feet |
| DWR | California Department of Water Resources |
| FERC | Federal Energy Regulatory Commission |
| Forest Service | United States Forest Service |
| LADWP | Los Angeles Department of Water and Power |
| Project | Rush Creek Project |
| RV | recreational vehicle |
| SCE | Southern California Edison Company |
| USGS | United States Geological Survey |

## 8.1 General Description of the Rush Creek Basin

This section describes the Rush Creek Basin, where Southern California Edison Company's (SCE) Rush Creek Project (Project) is located. The Rush Creek Basin is situated within the greater Mono Basin. The Federal Energy Regulatory Commission's (FERC) content requirements for this section are specified in Title 18 of the Code of Federal Regulations § 5.18(b)(1).

This section provides an overview of the Rush Creek Basin, including relevant tributaries; measurements of the area of the basin and length of stream; the project's river mile designation or other reference points; the topography and climate; and major land uses and economic activities.

### 8.1.1 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 Regional Water Quality Control Board Water Quality Control Plan for the Lahontan Region, North and South Basins (CRWQCB 2021);
- FERC's Rush Creek Project Environmental Assessment for Hydropower License, FERC Project No. 1389-001 (FERC 1992);
- Los Angeles Department of Water and Power (LADWP) Draft LADWP Urban Water Management Plan (LADWP 2020);
- California Department of Water Resources (DWR) California Interagency Watershed Map (Calwater 2.2.1) (DWR 2004); and
- United States Geological Survey (USGS), DWR, SCE, LADWP, and United States Department of the Interior, Bureau of Reclamation operated streamflow and snow gages.

### 8.1.2 General Overview

The 133-square mile Rush Creek Basin is the largest tributary/sub-basin within the greater Mono Basin, California (Map 8.1-1). The Rush Creek Basin is characterized by glacially formed, steep gradient (bedrock dominated), high elevation sub-basins (Rush Creek upstream of the confluence with Reversed Creek) and lower gradient, low elevation valley floor sub-basins (Rush Creek below the confluence with Reversed Creek). Reversed Creek, Alger Creek, Parker Creek, and Walker Creek are the major tributary/sub-basins to Rush Creek (Map 8.1-1).

Rush Creek originates in the vicinity of Marie Lakes at an elevation of approximately 11,000 feet and the creek ends approximately 26 miles downstream at Mono Lake (6,400 feet). Rush Creek passes through and/or is impounded by Waugh Lake (9,392 feet), Gem Lake (9,028 feet), Agnew Lake (8,470 feet), Silver Lake (7,215 feet) and Grant Lake (7,131 feet).

The Project is located in the farthest upstream portion (18 percent) of the basin. The principal Project facilities are located at Waugh Lake, Gem Lake, Agnew Lake, and the Rush Creek Powerhouse, upstream of Silver Lake and generally upstream of the Reversed Creek tributary confluence (the Rush Creek Powerhouse tailrace enters Rush Creek immediately below the Reversed Creek confluence). The Rush Creek Powerhouse is located on the valley floor at an elevation of approximately 7,300 feet (the powerhouse tailrace enters Rush Creek 17.4 river miles upstream of Mono Lake).

### 8.1.3 Climate and Hydrology

The Project experiences warm and mostly dry summers (with a few thunderstorms in late summer), and cold, snowy winters with average monthly temperatures and precipitation at the Rush Creek Powerhouse as shown in Table 8.1-1. According to the Köppen Climate Classification system, the June Lake area has a “Csb” climate classification (warm temperate climate with dry, warm summers).

The hydrology of the Rush Creek Basin is dominated by winter accumulation of snow in the upper elevations of the Sierra Nevada and subsequent snowmelt runoff (high flows) in the May–July period. The lowest base stream flows occur during September–February. Stream flow and precipitation (e.g., snowfall accumulation) are recorded in the vicinity of the Project through a network of monitoring and recording stations operated by the USGS, DWR, SCE, and LADWP. Data from snow courses at the higher elevations of the river basin (Table 8.1-2) indicate that the average April 1 water storage is approximately 30 inches. Average annual precipitation at Gem Lake is 21.8 inches. The average annual runoff for Rush Creek below Agnew Lake, based on records between the water years 1990 and 2023, is approximately 27,130 acre-feet (ac-ft)/year (Figure 8.1-1). The median runoff for the same period is 222,350 ac-ft/year.

### 8.1.4 Drainage Area, Sub-basin Area, and Stream Reach Lengths

The Rush Creek drainage area and sub-basin areas are provided in Table 8.1-3 and Map 8.1-1. Rush Creek stream reaches and river miles are identified on Map 8.1-2 (sheets 1 through 7). The Rush Creek stream reach lengths, types (Project-affected, non-Project), and characteristics are provided in Table 8.1-4.

### 8.1.5 Major Land Uses and Economy in the Project Area

Most of the Project facilities are located on federal lands within the Inyo National Forest, which is under the jurisdiction of the United States Forest Service (Forest Service). The Rush Creek Powerhouse is located on a parcel of SCE-owned lands. Waugh and Gem lakes are located within the Ansel Adams Wilderness and Agnew Lake is located on non-wilderness Inyo National Forest land. Land jurisdiction in the vicinity of the Project facilities is shown on Map 8.1-3.

Upstream of the powerhouse, the Rush Creek sub-basins are very steep and mountainous with no road access; therefore, land uses are limited to the Project and dispersed recreation. Project-related land uses include the three dams and associated reservoirs – Agnew Dam (Agnew Lake), Gem Dam (Gem Lake), and Rush Meadows Dam (Waugh Lake); a water conveyance system; the Rush Creek Powerhouse; and ancillary facilities. Dispersed recreation land use includes several high-county backpacking trails and hiking/camping/fishing in the vicinity of the Project reservoirs. These trails lead to several popular areas, such as Thousand-Island Lake, Garnet Lake, and the Ansel Adams Wilderness Area. The trails also connect with the John Muir Trail / Pacific Crest Trail. There is a horse pack outfitter, Frontier Pack Train, which has a Forest Service leased camp station approximately 0.25 mile from Rush Meadows Dam.

The primary residential/commercial community within the Rush Creek Basin is June Lake. The community is located on the Reversed Creek tributary along a 5-mile stretch of California State Route 158 (June Lake Loop Road). According to the 2022 American Community Survey 5-year estimate, the population of the June Lake Census Designated Place was 302 (USCB 2022). In the summer June Lake can grow by several thousand visitors: fishermen, campers, tourists, backpackers, and other outdoor enthusiasts (MCLAFC 2009). 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; cafes and restaurants; grocery and fishing tackle stores; and ski rental shops. There is also a small economic contribution from logging and cattle ranching.

Private property is limited outside of the June Lake community and there is limited private property in the vicinity of the Project or Project-affected streams. Private property does abut SCE-owned land along a portion of South Rush Creek, which is a Project-affected tributary that splits off from Rush Creek upstream of the Rush Creek Powerhouse (Map 8.1-3). Both the Dream Mountain Estates housing development and the Double Eagle Ranch are located on South Rush Creek adjacent to SCE land on the valley floor near the powerhouse.

There are a few residential and recreational developments (non-Project facilities) along the Silver Lake shoreline (non-Project lake). Approximately 27 homes are located on long-term Forest Service leases situated along the east shore of Silver Lake (typically each has a boat dock on Silver Lake or Rush Creek entering Silver Lake). Silver Lake Resort, which includes an RV trailer court with space for approximately 100 trailers, is situated on the northwest corner of the lake on long-term Forest Service lease land. There is also a boat ramp and Forest Service campground at the northwest end of the lake and there is a small picnic area on the southwest edge of the lake.

In the basin downstream of Silver Lake, there is a Forest Service campground (Aerie Crag RV Campground) along Rush Creek and a marina and campground at Grant Lake that is located on Forest Service land (non-Project recreational facilities). Grant Lake is an LADWP storage reservoir. Much of the land from downstream of Grant Lake to Mono Lake, the terminus of Rush Creek, is owned by the City of Los Angeles.

Refer to Section 8.9, Land Use and Section 8.14, Socioeconomics for additional information.

### 8.1.6 Dams and Diversions

Project reservoirs – Waugh Lake, Gem Lake, and Agnew Lake – were historically dammed for hydropower water storage by Rush Meadows Dam, Gem Dam, and Agnew Dam, respectively. New reservoir operations were initiated in 2012 and formalized in 2016 (FERC 2016) that implemented seismic restrictions on reservoir elevations (maintain Waugh Lake <9,392.1 feet; Gem Lake <9,027.5 feet; and Agnew Lake – completely drained) and significantly reduced the combined storage capacity of Waugh, Gem, and Agnew lakes from approximately 23,000 ac-ft to 12,300 ac-ft with post-2016 specifications (see Section 4.1.2.1, Seismic Restrictions).

Currently, Waugh Lake is not operated for storage, rather the low-level outlets on Rush Meadows Dam are left open so that inflow passes through the reservoir. During spring high flows, temporary storage occurs in the lake when the inflows exceed the capacity of the low-level outlets and the notched spillway. Gem Lake stores water in the spring/early summer at the reduced seismic restriction elevation and releases stored water for generation later in the year. Agnew Lake does not impound water. Inflows pass through an opening in the base of the dam.

Historically, water from Gem Lake and Agnew Lake was transported through flowlines/penstocks to the Rush Creek Powerhouse. Currently, only water from Gem Lake is transported to the powerhouse. Water exiting the powerhouse enters a short tailrace and is returned to Rush Creek immediately downstream of the Reversed Creek confluence and approximately 0.7 mile upstream of Silver Lake.

There are three non-Project glacial lakes in the Rush Creek Basin without dams or significant diversion – Silver, Gull, and June lakes. June Lake has a June Lake Public Utility District water supply intake. Silver Lake has several large boulders placed in the natural outlet that slightly modifies the lake elevation, depending on the outflow volume.

June Lake Public Utility District diverts water from June Lake, Snow Creek, Fern Creek, and Yost Creek in the Reversed Creek drainage (JLPUD 2021). The only other water diversions or dams are in the lower portion of the basin and owned and operated by LADWP. These include diversions on Parker Creek, Walker Creek, and Grant Lake. Grant Lake Dam was constructed in 1940 and has a storage capacity of 47,171 ac-ft at the spillway elevation of 7,130 feet (SWRCB 2010).

### 8.1.7 Tributary Rivers and Streams Affected by the Project

The Project affects Rush Creek from Waugh Lake downstream to Grant Lake by storing water (Project reservoirs) and modifying the stream flow pattern (timing, magnitude, duration of flows). No other tributary rivers or streams in the basin, including Reversed Creek, Alger Creek, Parker Creek, and Walker Creek, are affected by the Project.

### 8.1.8 References

CRWQCB (California Regional Water Quality Control Board) Lahontan Region. 2021. Water Quality Control Plan for the Lahontan Region, North and South Basins (Basin Plan). Revised May 2021. Available at: https://www.waterboards.ca.gov/lahontan/water_issues/programs/basin_plan/references.html.

DWR (California Department of Water Resources). 2004. California Interagency Watershed Map (Calwater 2.2.1), California, 2004, California Interagency Watershed Mapping Committee.

FERC (Federal Energy Regulatory Commission). 1992. Environmental Assessment for Hydropower License. Rush Creek Project No. 1389. FERC eLibrary No. 19920604-0017.

———. 2016. Plan and Schedule for the Seismic Retrofit of the Rush Creek Project. FERC Accession No. 20161108-0178. October 27.

JLPUD (June Lake Public Utility District). 2021. Available at: https://www.junelakepud.com/about-us.

LADWP (Los Angeles Department of Water and Power). 2020. Draft LADWP Urban Water Management Plan. http://ladwp.com/UWMP.

MCLAFC (Mono County Local Agency Formation Commission). 2009. Municipal Service Review and Sphere of Influence Recommendation - June Lake Public Utility District Mono County, California. Available at: https://www.monocounty.ca.gov/sites/default/files/fileattachments/local_agency_formation_commission_lafco/page/3562/junelakepublicutilitydistrict_02.2009.pdf.

SWRCB (State Water Resources Control Board). 2010. Mono Basin Stream Restoration and Monitoring Program. Synthesis of Instream Flow Recommendations to the SWRCB and the LADWP. Final Report. Available at: https://www.waterboards.ca.gov/waterrights/water_issues/programs/mono_lake/docs/monolake_synthesis_rpt.pdf.

USCB (United States Census Bureau). 2022. American Community Survey Estimates Data Profile, June Lake CDP. Table DP05. Available at: https://data.census.gov/table/ACSDP5Y2022.DP05?q=June%20Lake%20CDP.

# TABLES

**Table 8.1-1. Monthly Average Air Temperature and Rainfall at Rush Creek Powerhouse (CDEC Station RSH) – All Available Years**

| Month | Average Monthly Air Temperature (degrees Celsius) | Average Monthly Rainfall (inches) |
|---|---|---|
| January | 36 | 1.0 |
| February | 36 | 0.9 |
| March | 39 | 1.2 |
| April | 45 | 1.5 |
| May | 52 | 2.0 |
| June | 64 | 0.9 |
| July | 72 | 0.2 |
| August | 70 | 0.2 |
| September | 62 | 0.6 |
| October | 51 | 1.2 |
| November | 43 | 1.1 |
| December | 34 | 1.3 |

## Table 8.1-2. Snow Courses and Meteorological Stations Located in the Vicinity of the Rush Creek Project

| Name | Agency/Operator | Elevation (feet) | Location | |
|---|---|---|---|---|
| | | | Latitude | Longitude |
| **Snow Courses** | | | | |
| Gem Pass | DWR/DFM-Hydro-SMN | 10,750 | 37.78000 | -119.17000 |
| Gem Lake | SCE, Bishop | 9,150 | 37.75200 | -119.16200 |
| Agnew Pass | USBR | 9,450 | 37.72663 | -119.14173 |
| **Meteorological Stations** | | | | |
| Gem Pass | DWR/DFM-Hydro-SMN | 10,750 | 37.78000 | -119.17000 |
| Agnew Pass | USBR | 9,450 | 37.72663 | -119.14173 |

Key: DWR = California Department of Water Resources
SCE = Southern California Edison Company
USBR = United States Department of the Interior, Bureau of Reclamation

## Table 8.1-3. Information on Drainage Area of the Rush Creek Basin and Sub-basins (see Map 8.1-1)

| Rush Creek Basin & Sub-basins | Sub-basin Areas (miles²) | Cumulative Basin Area (miles²) | Length of Rush Creek Associated with each Sub-basin (miles) | Rush Creek Project Facilities Present (Yes / No) | Elevation at the Sub-basin Downstream and Upstream Junction with Rush Creek | |
|---|---|---|---|---|---|---|
| | | | | | Downstream Junction (feet) | Upstream Junction (feet) |
| Marie Lakes (Waugh Lake) Sub-basin | 15.00 | 15.00 | 4.12 (RM 22.24–26.36) | Yes | 9,376 | 10,858 |
| Crest Creek Sub-basin | | | | | | |
| • Gem Dam Sub-basin | 6.91 | 21.91 | 2.76 (RM 19.48–22.24) | Yes | 9,008 | 9,376 |
| • Agnew Dam Sub-basin | 1.26 | 23.17 | 0.88 (RM 18.6–19.48) | Yes | 8,460 | 9,008 |
| • Below Dams and Above Reversed Creek Sub-basin | 1.36 | 24.53 | 1.1 (RM 17.5–18.6) | Yes | 7,221 | 8,460 |
| June Lakes (Reversed Creek) Sub-basin | 15.10 | 39.63 | Tributary Enters at RM 17.5 | No | 7,221 | — |
| Alger Creek (Silver Lake) Sub-basin | 7.50 | 47.13 | 1.61 (RM 15.89–17.5) | No | 7,215 | 7,221 |
| Grant Lakes Sub-basin | 11.4 | 58.53 | 6.59 (RM 9.30–15.89) | No | 7,131 | 7,215 |
| Parker Creek Sub-basin | 21.0 | 79.53 | 4.13 (RM 5.17–9.30) | No | 6,665 | 7,131 |
| Walker Creek Sub-basin | 13.8 | 93.33 | 0.57 (RM 4.60–5.17) | No | 6,612 | 6,665 |
| East Craters Sand Flat Sub-basin | 29.3 | 122.63 | Enters at Approx. RM 4.0 | No | 6,558 | 6,612 |
| Lower Rush Creek Sub-basin | 10.7 | 133.33 | 4.60 (RM 0.0–4.60) | No | 6,372 | 6,558 |
| **Total** | **--** | **133.33** | **26.36** | **—** | **—** | **—** |

Key: RM = River Mile

## Table 8.1-4. Stream Reaches

| Reach Name | Reach Length (miles) / River Mile (RM) | 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 |
| Grant Lake | 3.88 (RM 9.32–13.20) | 7,131[2] | — | Non-Project Reservoir; LADWP Controlled |
| Rush Creek Below Grant Lake | 9.32 (RM 0.0–9.32) | 6,327–7,080 (1.44%) | Non-Project Stream Reach; LADWP Controlled | 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:

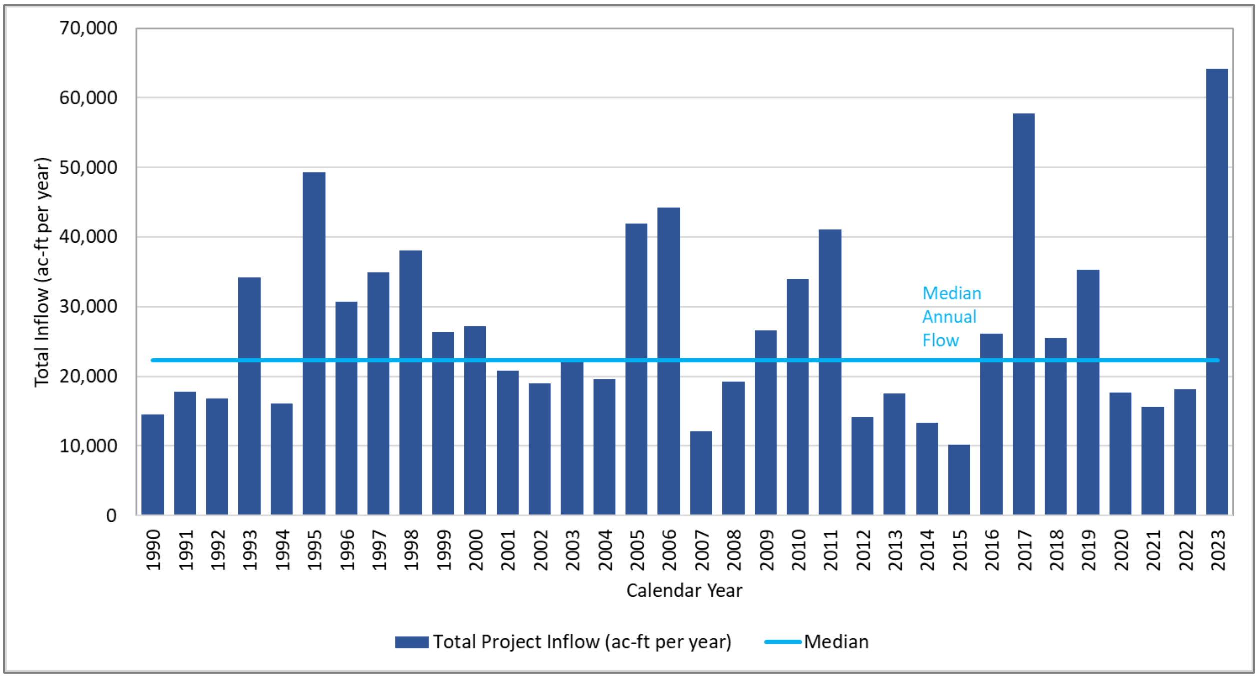
1 Maximum seismic restriction elevation.

2 Approximate ordinary high water mark.

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

Key: LADWP = Los Angeles Department of Water and Power
RM = River Mile

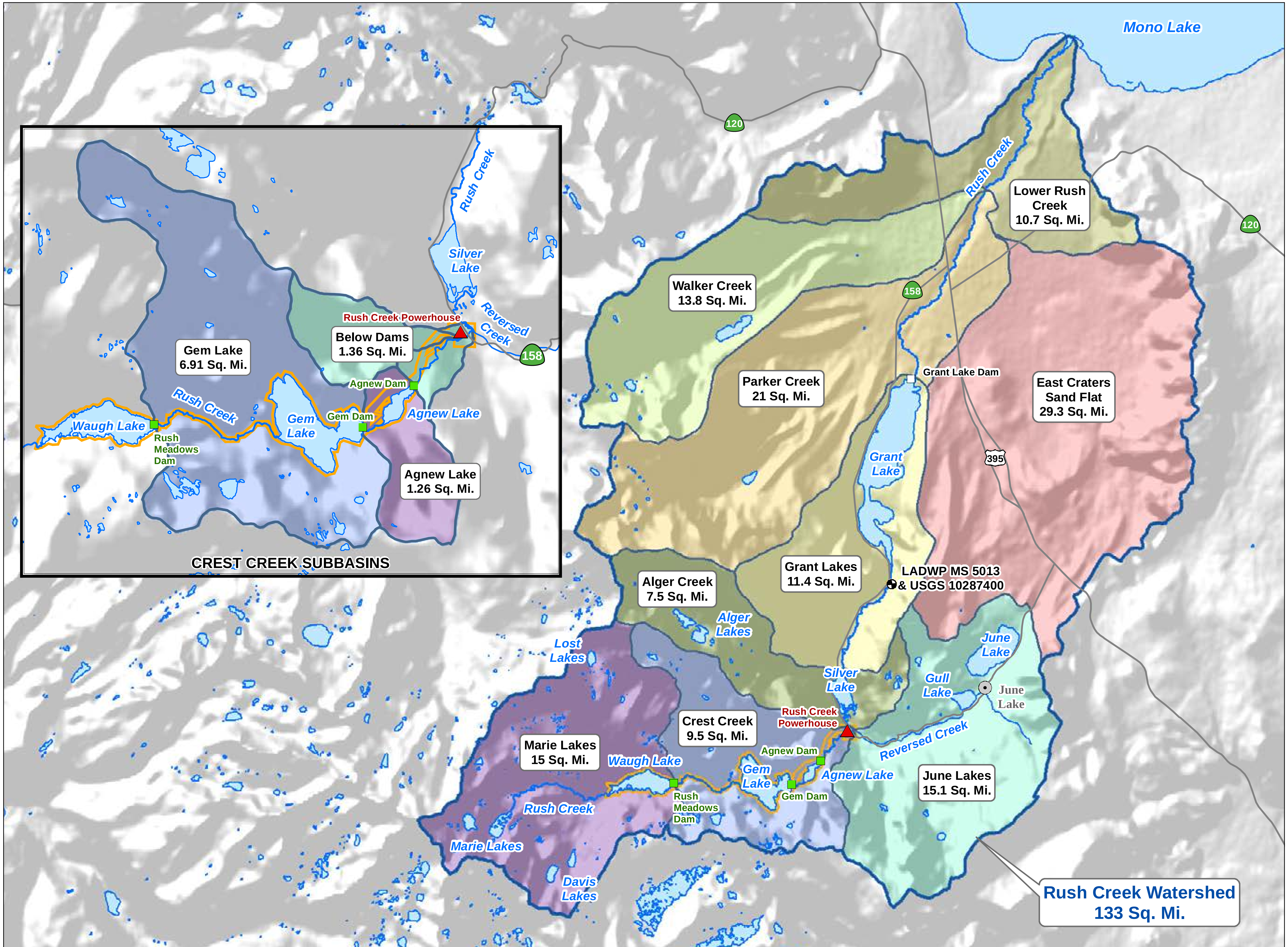
# FIGURES




*Data Source: USGS 10287300 and USGS 10287289 – Combined Rush Creek below Agnew*

**Figure 8.1-1. Annual Inflow to the Rush Creek Project (Water Year 1990–2023)**

# MAPS




**SCE Facilities**

- Dam
- Powerhouse
- FERC Boundary

**Other Features**

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

**Watershed / Subbasin Boundaries***

- Alger Creek
- Crest Creek
- East Craters Sand Flat
- Grant Lakes
- June Lakes
- Lower Rush Creek
- Marie Lakes
- Parker Creek
- Walker Creek

*** DATA SOURCE: Calwater, 2.21**
**Some minor modifications made based on high-resolution aerial imagery**

**Operations Modeling**

- Model Node (Gage used to scale unimpaired inflows to the upper reservoirs)

SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead

Rush Creek Project (FERC 1389)

**Map 8.1-1**

**Rush Creek Basin and Sub-basins**

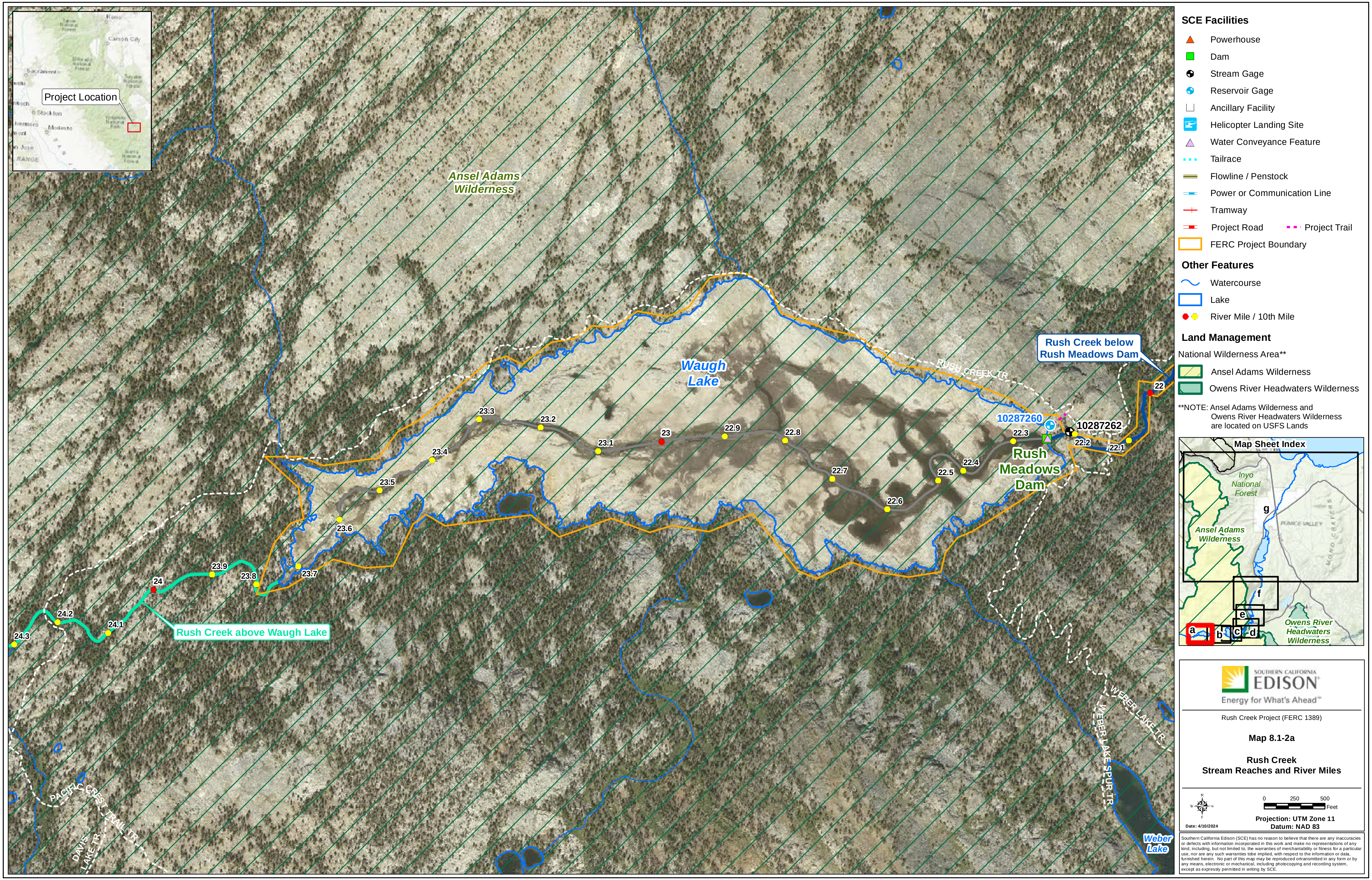
0 0.5 1 Miles

**Date: 4/10/2024**

**Projection: UTM Zone 11**
**Datum: NAD 83**



C:\GIS\237800343\map\Rush Creek\HydroMaps\SCE_RUSH_CREEK_Wshed_Subbasins_17i11i_04.mxd






C:\GIS\237800343\map\Rush Creek\HydroMaps\SCE_RUSH_CREEK_ProjReaches_17i11i_03.mxd


**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
- Lake
- 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

Energy for What's Ahead℠

Rush Creek Project (FERC 1389)

**Map 8.1-2b**

**Rush Creek**
**Stream Reaches and River Miles**

Date: 4/10/2024

0 250 500 Feet

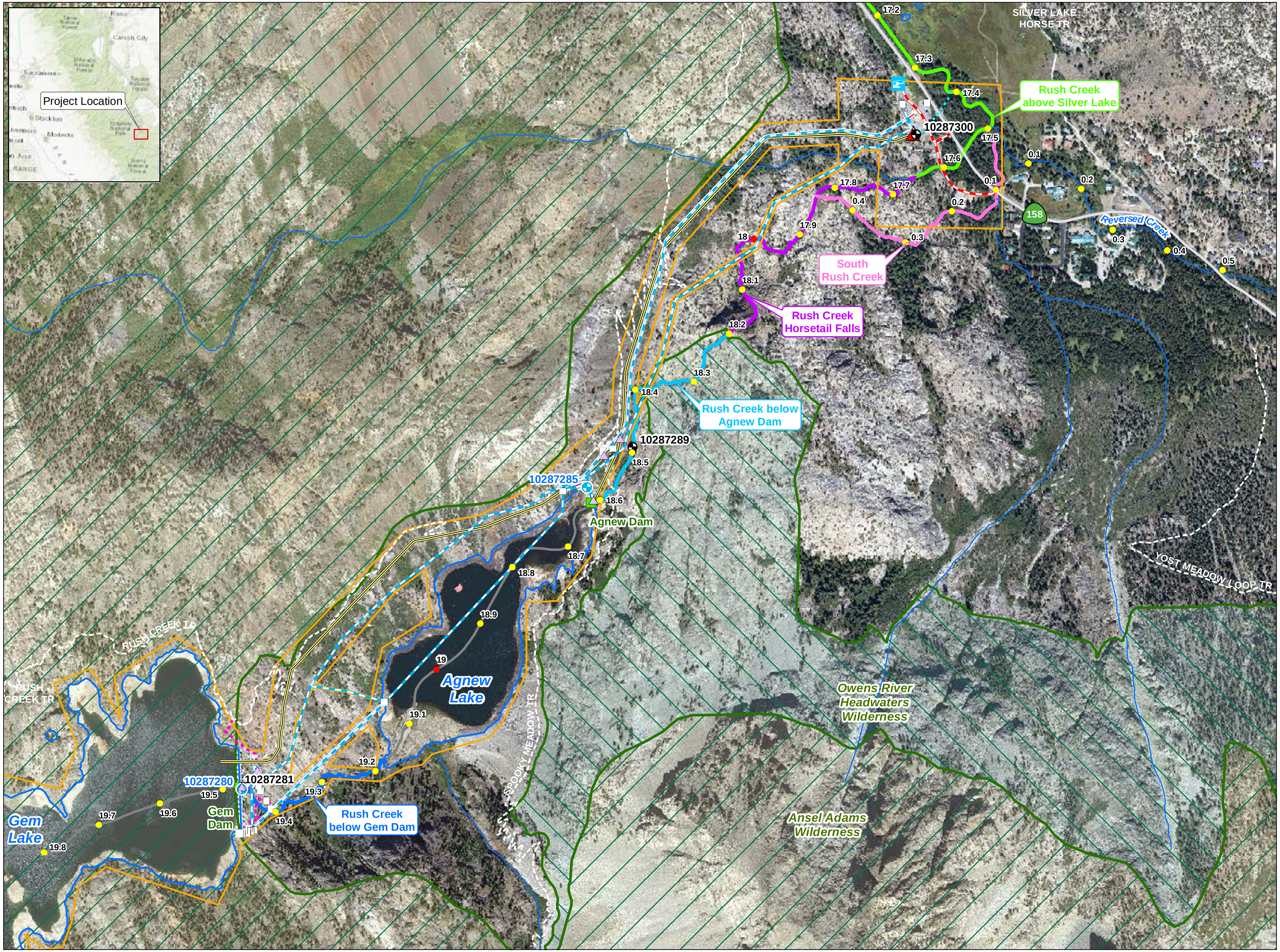
**Projection: UTM Zone 11**
**Datum: NAD 83**



C:\GIS\237800343\map\Rush Creek\HydroMaps\SCE_RUSH_CREEK_ProjReaches_17i11i_03.mxd




C:\GIS\237800343\map\Rush Creek\HydroMaps\SCE_RUSH_CREEK_ProjReaches_17i11i_03.mxd




### 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

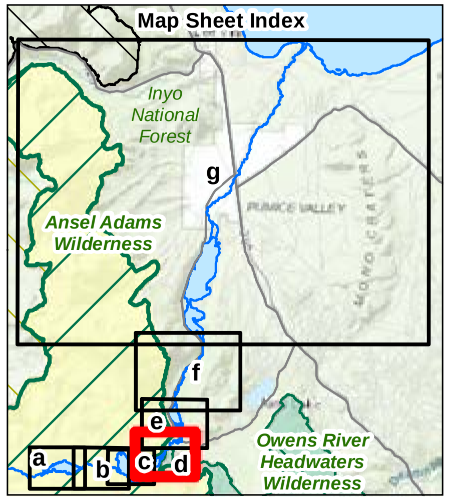
- Watercourse
- Lake
- River Mile / 10th Mile

### 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

Energy for What's Ahead

Rush Creek Project (FERC 1389)

**Map 8.1-2d**

**Rush Creek Stream Reaches and River Miles**

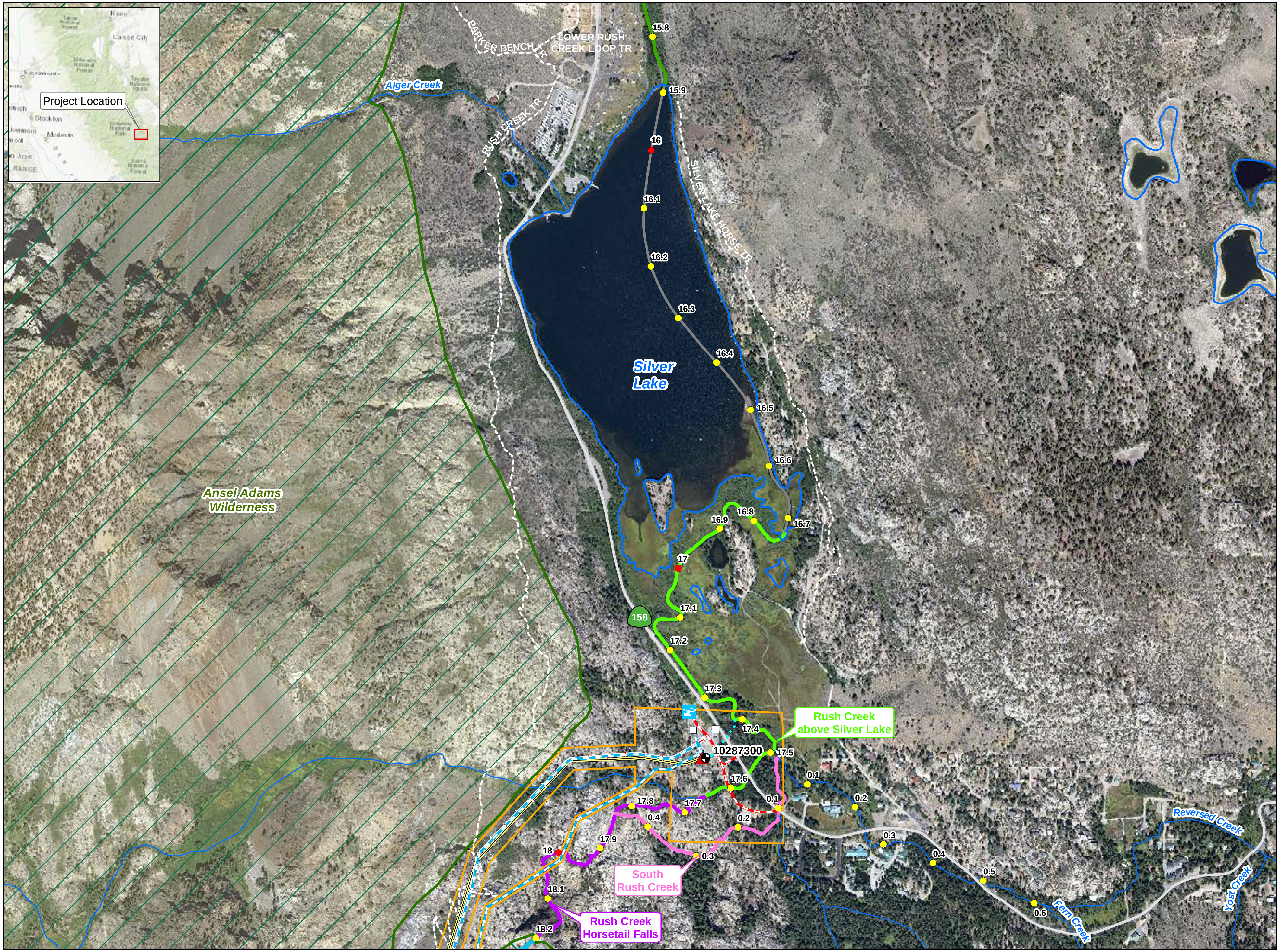
0 250 500 Feet

Date: 4/10/2024

Projection: UTM Zone 11
Datum: NAD 83



C:\GIS\237800343\map\Rush Creek\HydroMaps\SCE_RUSH_CREEK_ProjReaches_17i11i_03.mxd




## 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

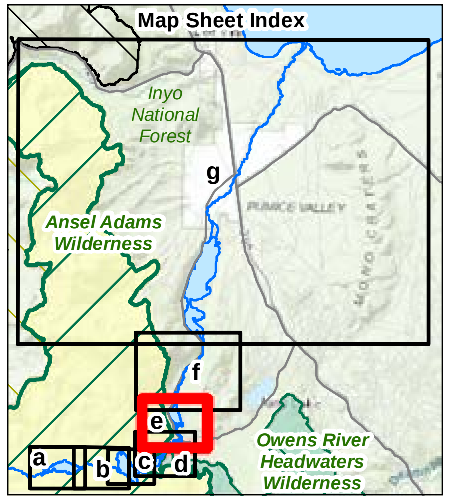
- Watercourse
- Lake
- River Mile / 10th Mile

## 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
Energy for What's Ahead℠

Rush Creek Project (FERC 1389)

**Map 8.1-2e**

**Rush Creek**
**Stream Reaches and River Miles**

0 250 500 Feet

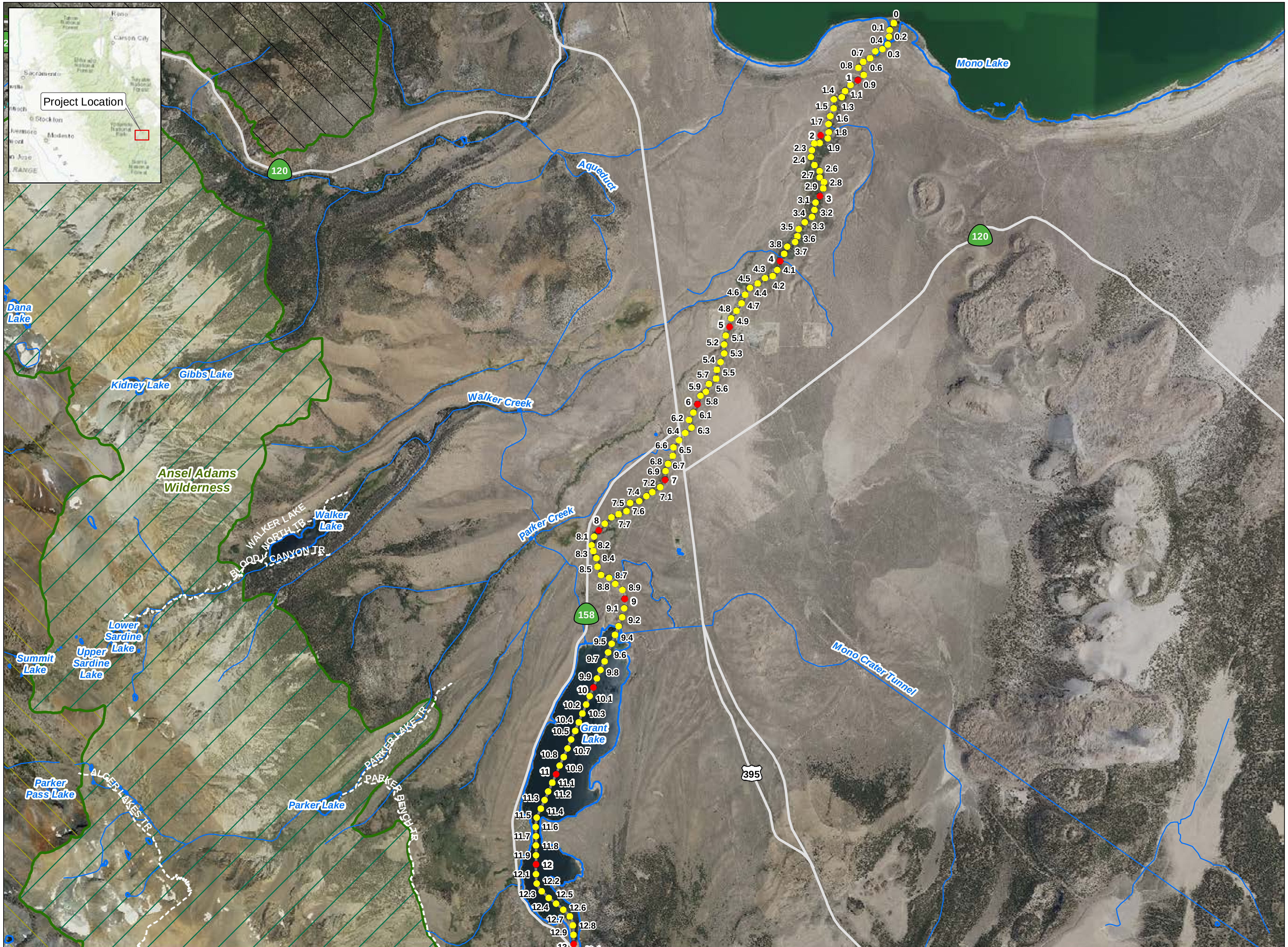
Date: 4/10/2024

**Projection: UTM Zone 11**
**Datum: NAD 83**



C:\GIS\237800343\map\Rush Creek\HydroMaps\SCE_RUSH_CREEK_ProjReaches_17i11i_03.mxd


C:\GIS\237800343\map\Rush Creek\HydroMaps\SCE_RUSH_CREEK_ProjReaches_17i11i_03.mxd




**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**

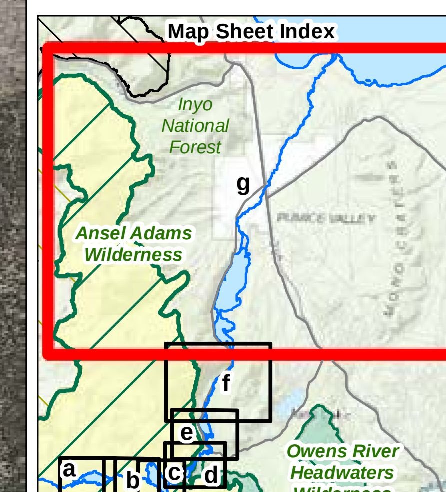
- Watercourse
- Lake
- River Mile / 10th Mile

**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
Energy for What's Ahead

Rush Creek Project (FERC 1389)

**Map 8.1-2g**

**Rush Creek**
**Stream Reaches and River Miles**

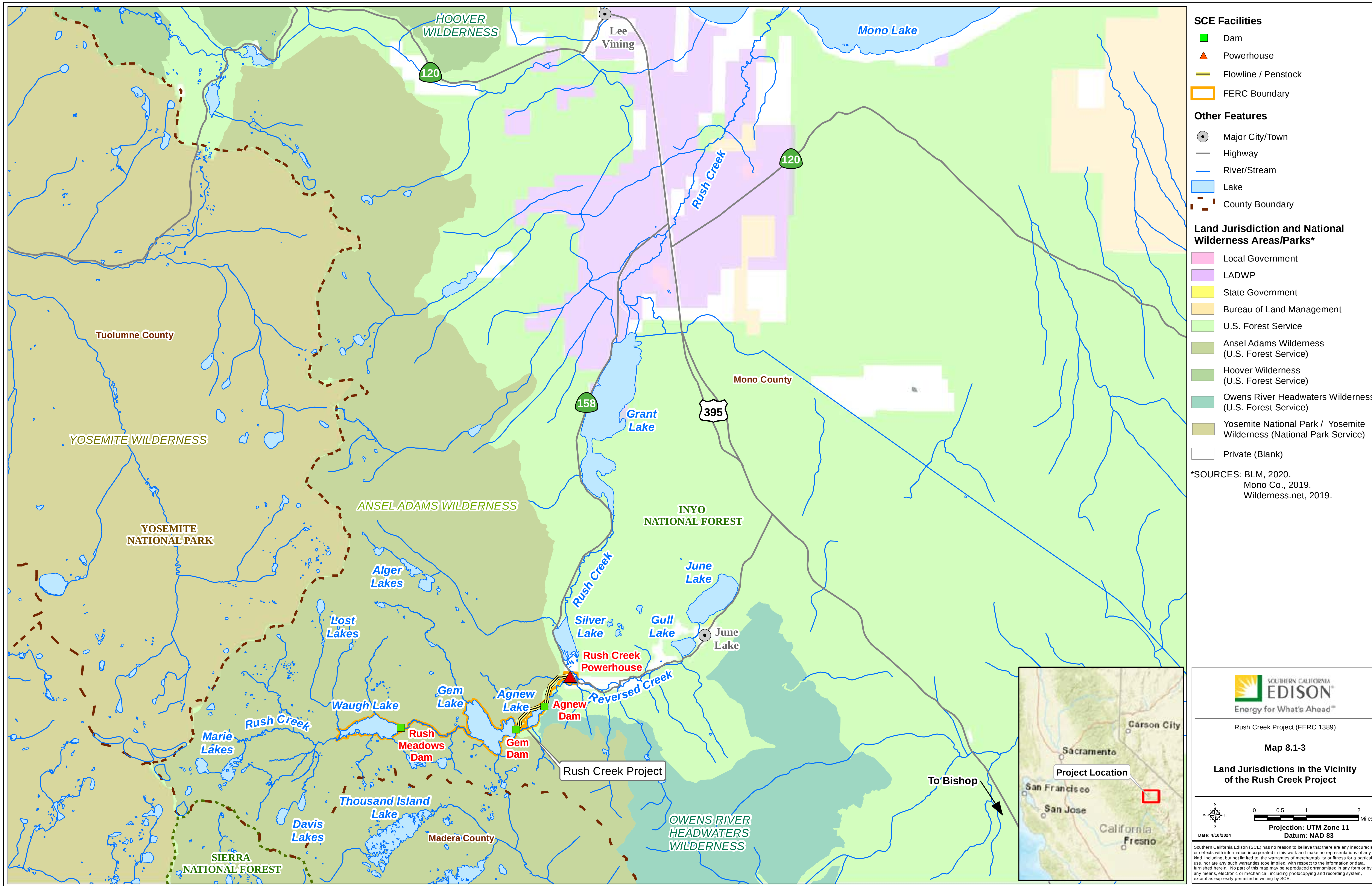
0 2,500 5,000 Feet

Date: 4/10/2024

**Projection: UTM Zone 11**
**Datum: NAD 83**



C:\GIS\237800343\map\Rush Creek\HydroMaps\SCE_RUSH_CREEK_ProjReaches_17i11i_03.mxd






C:\GIS\237800343\map\Rush Creek\SCE_RUSH_CREEK_Juris_Vicinity_17i11i_01.mxd

## Table of Contents

Page

8.2 Water Use and Hydrology ........ 8.2-1
8.2.1 Information Sources ........ 8.2-1
8.2.2 Description of the Project and Surrounding Area ........ 8.2-1
8.2.3 Drainage Area ........ 8.2-2
8.2.4 Reservoir, Powerhouse, and Stream Data/Flow Statistics ........ 8.2-2
8.2.5 Monthly Flow Duration Curves and Project Dependable Capacity ........ 8.2-4
8.2.6 Existing Water Uses ........ 8.2-5
8.2.7 Existing Instream Water Uses and Water Rights ........ 8.2-6
8.2.8 References ........ 8.2-7

## List of Tables

Table 8.2-1. Hydrology Data Sources ........ 8.2-9
Table 8.2-2. FERC Elevation Requirements for Waugh, Gem, and Agnew Lakes, Including Current Seismic Restrictions ........ 8.2-11
Table 8.2-3. Reservoir/Lake Physical Data ........ 8.2-12
Table 8.2-4. Monthly Mean and Maximum Flows (cfs) through Rush Creek Powerhouse (SCE 367 / USGS 10287300) ........ 8.2-13
Table 8.2-5. FERC Instream Flow Requirements for the Rush Creek Project included in the Existing License ........ 8.2-14
Table 8.2-6. Monthly Mean, Minimum, and Maximum Rush Creek Flows (cfs) Below Gem Dam (Flow Gage Records Minimum Flows Only), for the Pre-seismic (WY 2000–2011) and Post-seismic (WY 2012–2023) Restriction Time Periods (SCE 352 R/USGS 10287281) ........ 8.2-15
Table 8.2-7. Monthly Mean, Minimum, and Maximum Rush Creek Flows (cfs) Below Agnew Dam Flume for the Pre-seismic (WY 2000–2011) and Post-seismic (WY 2012–2023) Restriction Time Periods (SCE 357/USGS 10287289) ........ 8.2-16
Table 8.2-8. Existing and Unimpaired Monthly Mean, Minimum, and Maximum Flows (cfs) for the Combined Rush Creek Below Agnew Dam and Rush Creek Powerhouse (Top Table: Historical Operations [WY 2000–2011], Bottom Table: Operations with Seismic Restrictions [WY 2012–2023]) (USGS 10287289 and USGS 10287300) ........ 8.2-17

Table 8.2-9. Existing and Unimpaired Monthly Mean, Minimum, and Maximum Flows (cfs) in Rush Creek below Silver Lake (Top Table: Historical Operations [WY 2000–2011], Bottom Table: Operations with Seismic Restrictions [WY 2012–2019]) (LADWP MS 5013/USGS 10287400) .......................... 8.2-18

Table 8.2-10. Summary of Appropriative Water Rights ................................ 8.2-19

## LIST OF FIGURES

Figure 8.2-1. Rush Creek Project Reservoir Storage (WY 1990–2023) ....... 8.2-21

Figure 8.2-2. Daily Mean Flow (WY 1990 to 2023) at the Rush Creek Powerhouse (SCE 367/USGS 10287300), Rush Creek below Agnew Dam (SCE 357/USGS 10287289), and the Locations Combined (Combined Powerhouse and Rush Creek Below Agnew Dam) .................................................... 8.2-23

Figure 8.2-3. Average Monthly Powerhouse Flows [Top Graph: Flow in cubic feet per second (cfs); Bottom Graph: Percentage of Average Annual Flow] (SCE 367/USGS 10287300) ............... 8.2-24

Figure 8.2-4. Gradient for Project-Affected and Non-Project Affected Stream Reaches/Lakes in the Vicinity of Rush Creek Project ........................................................................ 8.2-25

Figure 8.2-5. Historical Mean Daily Flows (1999–2023 WY) for Rush Creek Below Rush Meadows Dam (SCE 359 R/USGS 10287262) ......................................................................... 8.2-26

Figure 8.2-6. Historical Mean Daily Flows (1999–2023 WY) for Rush Creek Below Gem Dam (SCE 352 R/USGS 10287281) ......... 8.2-27

Figure 8.2-7. Historical Mean Daily Flows (1990–2023 WY) for Rush Creek Below Agnew Dam (SCE 357/USGS 10287289).......... 8.2-28

Figure 8.2-8. Historical Mean Daily Flows (1999–2023 WY) and Unimpaired Flows for Rush Creek Below Rush Meadows Dam (SCE 359 R/USGS 10287262) ...................................... 8.2-29

Figure 8.2-9. Historical Mean Daily Flows (1999–2023 WY) and Unimpaired Flows for Rush Creek Below Gem Dam (SCE 352 R/USGS 10287281) ....................................................... 8.2-30

Figure 8.2-10. Historical Mean Daily Flows (1990–2023 WY) and Unimpaired Flows for Rush Creek Below Agnew Dam (SCE 357/USGS 10287289)........................................................... 8.2-31

Figure 8.2-11. Historical Mean Daily Flows (1990–2023 WY) and Unimpaired Flows for the Combined Powerhouse and Rush Creek below Agnew Dam Location (SCE 357/USGS 10287289 and SCE 367/USGS 10287300)............................ 8.2-32

| | | |
|---|---|---|
| Figure 8.2-12. | Historical Mean Daily Flows (1990–2023 WY) and Unimpaired Flows for Rush Creek Below Silver Lake (LADWP MS 5013/ USGS 10287400) | 8.2-33 |
| Figure 8.2-13. | Mean Annual Existing and Unimpaired Flow (1990–2023) at the Combined Powerhouse and Rush Creek Powerhouse Gages (SCE 357/USGS 10287289 and SCE 367/USGS 10287300) | 8.2-34 |
| Figure 8.2-14. | Mean Annual Existing and Unimpaired Flow (1990–2023) Below Silver Lake (LADWP MS 5013/USGS 10287400) | 8.2-34 |
| Figure 8.2-15. | Average Monthly Rush Creek Flows for Combined Powerhouse and Rush Creek Below Agnew Dam (SCE 357/USGS 10287289 and SCE 367/USGS 10287300) for the Pre-seismic (1989–2011) and Post-seismic (2012–2023) Restriction Time Periods (Top Graph: Flow in cfs; Bottom Graph: Percentage of Average Annual Flow) | 8.2-35 |
| Figure 8.2-16. | Average Monthly Rush Creek Flows for Below Silver Lake (LADWP MS 5013/USGS 10287400) for the Pre-seismic (1989–2011) and Post-seismic (2012–2023) Restriction Time Periods (Top Graph: Flow in cfs; Bottom Graph: Percentage of Average Annual Flow) | 8.2-36 |
| Figure 8.2-17. | Monthly Flow Exceedance Curves for Rush Creek Powerhouse (1989–2023) | 8.2-37 |
| Figure 8.2-18. | Monthly Flow Exceedance Curves for Rush Creek Below Agnew Dam (1989–2023) | 8.2-37 |
| Figure 8.2-19. | Monthly Flow Exceedance Curves for Combined Powerhouse and Rush Creek Below Agnew Dam, Existing and Unimpaired Flows (1989–2023) | 8.2-38 |
| Figure 8.2-20. | Monthly Flow Exceedance Curves for Rush Creek Below Silver Lake, Existing and Unimpaired Flows (1989–2023) | 8.2-39 |
| Figure 8.2-21. | Time Series of Rush Creek Powerhouse Flows | 8.2-40 |


## LIST OF MAPS


| | | |
|---|---|---|
| Map 8.2-1. | Sources and Locations of Gaged Flow Data | 8.2-42 |


## LIST OF APPENDICES


| | |
|---|---|
| Appendix 8.2-A | Unimpaired Flow Calculation Methods |
| Appendix 8.2-B | Existing and Unimpaired Monthly Flow Duration Curves (1989–2019) |

## LIST OF ACRONYMS

| | |
|---|---|
| ac-ft | acre-feet |
| Basin Plan | Water Quality Control Plan for the Lahontan Region, North and South Basins |
| cfs | cubic feet per second |
| CRWQCB | California Regional Water Quality Control Board |
| FERC | Federal Energy Regulatory Commission |
| JLPUD | June Lake Public Utility District |
| kW | kilowatt |
| LADWP | Los Angeles Department of Water and Power |
| MW | megawatt |
| Project | Rush Creek Project |
| SCE | Southern California Edison Company |
| USGS | United States Geological Survey |

## 8.2 WATER USE AND HYDROLOGY

This section describes water use and hydrology in Rush Creek, as they relate to Southern California Edison Company's (SCE) Rush Creek Project (Project). The Federal Energy Regulatory Commission (FERC) regulations require information on both water quantity (water use and hydrology) and water quality (chemical/physical parameters) for waters affected by the Project. This section presents information on water quantity. Information on water quality is addressed in Section 8.3, Water Quality.

### 8.2.1 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 Regional Water Quality Control Board (CRWQCB) Water Quality Control Plan for the Lahontan Region, North and South Basins (CRWQCB 2021)
- Gaging data from United States Geological Survey (USGS), SCE, and Los Angeles Department of Water and Power (LADWP)
- Storage Capacity, Detention Time, and Selected Sediment Deposition Characteristics for Gull and Silver Lakes, Mono County, California (USGS 1995)

### 8.2.2 Description of the Project and Surrounding Area

Rush Creek, in the vicinity of the Project, is located primarily in a high elevation basin in the eastern slope of the Sierra Nevada Mountains in Mono County. The headwaters of Rush Creek originate in the Marie Lakes Basin and the slopes of a series of high elevation mountain peaks (Donohue Peak, Mount Lyell, Rodgers Peak, Mount Davis, and Blacktop Peak) in the Ansel Adams Wilderness (Map 8.1-1). The upper Rush Creek Basin (upstream of the Reversed Creek confluence) is predominantly comprised of undeveloped high elevation mountainous country. The lower Rush Creek Basin (Reversed Creek confluence and downstream) is comprised of a lower elevation valley with limited residential development. Rush Creek flows through the Ansel Adams Wilderness, a small portion of the Owens River Headwaters Wilderness, and the Inyo National Forest (Map 8.1-2).

The Project facilities include three dams and associated reservoirs – Rush Meadows Dam (Waugh Lake), Gem Dam (Gem Lake), and Agnew Dam (Agnew Lake); a water conveyance system; the Rush Creek Powerhouse; and ancillary facilities as described in Section 4.0, No-Action Alternative. An overview of the Project facilities and surrounding area is provided in Maps 4-1 through 4-4. The Rush Creek Powerhouse is located approximately 0.7 mile upstream of Silver Lake at an elevation of approximately 7,300 feet and is fed by water diverted from Gem Dam that is conveyed through a flowline and two penstocks. Historically, prior to seismic restrictions on the reservoirs (see Section 4.1.2.1, Seismic Restrictions), water from Agnew Dam also fed the Rush Creek Powerhouse. After passing through Rush Creek Powerhouse, the water reenters Rush

Creek upstream of Silver Lake. Sources and locations of gaged flow data are shown in Table 8.2-1 and Map 8.2-1.

### 8.2.3 Drainage Area

The Rush Creek Basin drainage area is 133 square miles; however, the Project is in the farthest upstream portion of the basin encompassing only 23.17 square miles (18 percent of total basin area) (Map 8.1-1 and Table 8.1-1). The drainage area upstream of the powerhouse includes 15.0 square miles upstream of Rush Meadows Dam, 6.91 square miles upstream of Gem Lake Dam, and 1.26 square miles upstream of Agnew Lake Dam.

### 8.2.4 Reservoir, Powerhouse, and Stream Data/Flow Statistics

#### 8.2.4.1 Reservoirs

The Project reservoir elevation requirements in the current FERC license are provided in Table 8.2-2. Due to the recent discovery of an earthquake fault line in the vicinity of the Project, reservoir storage was restricted/reduced in all Project reservoirs starting in 2012. Table 8.2-3 shows physical data for reservoirs under the pre-2012 and post-2012 seismic restrictions, including surface area, volume/capacity, maximum depth, mean depth, flushing rate, shoreline length, and substrate composition. The seismic restrictions on reservoir elevations were formalized in 2016 (FERC 2016) (maintain Waugh Lake ≤9,392.1 feet; Gem Lake ≤9,027.5 feet; and Agnew Lake completely drained) and significantly reduced the total storage capacity of Waugh, Gem, and Agnew lakes from approximately 23,000 acre-feet (ac-ft) to 12,300 ac-ft (refer to full description in Section 4.1.2.1, Seismic Restrictions).

Figure 8.2-1 shows the daily storage values for each of the Project reservoirs (Waugh, Gem, and Agnew) between water years 1990 and 2023. Under current conditions the Project reservoirs are operated as follows. Waugh Lake is operated to not store water to the extent possible given the infrastructure and inflows. The spillway was notched in 2018 to help facilitate compliance with the FERC-mandated reservoir elevation restrictions and the low-level outlets are left open year-round. In the spring, however, when inflows to the reservoir exceed the outflow capacity of the low-level outlets and the spillway notch, the reservoir can temporarily impound water. Gem Lake fills up to the maximum seismic restriction capacity of approximately 10,752 ac-ft (9,027.5 feet elevation) in the late spring and early summer and maintains storage through the summer. Most of the storage is released in the fall to early spring period through the Rush Creek Powerhouse in preparation for subsequent refill of the reservoir. Agnew Lake no longer stores water or diverts water for power generation. Water entering the lake passes through two notches in the bottom of the dam and flows into Rush Creek. Downstream of the Project, Rush Creek flows through Silver Lake (non-project), Grant Lake (non-project), and eventually enters Mono Lake.

#### 8.2.4.2 Powerhouse

The mean and maximum average daily flows through the Rush Creek Powerhouse (USGS 10287300) are summarized in Table 8.2-4. Flows through the powerhouse are variable depending on the time of year and the amount of water available (Figure 8.2-2). The post-2012 seismic restrictions imposed on the storage/elevation of the Project reservoirs reduced the generating capacity of Rush Creek Powerhouse during some months, particularly September through February (i.e., less stored water available to release during the low-flow season). This pattern can be seen in Figure 8.2-3, which shows the average historical pre-seismic (1989–2011) and average post-seismic restriction (2012–2023) monthly flow and percent of annual flow through Rush Creek Powerhouse.

#### 8.2.4.3 Streams

Rush Creek and various sub-reaches of the creek, including river miles, are shown on Map 8.1-2 and in Table 8.1-3. Project-affected stream reaches from upstream to downstream include: (1) Rush Creek below Rush Meadows Dam; (2) Rush Creek below Gem Dam; (3) Rush Creek below Agnew Dam; (4) Rush Creek Horsetail Falls; (5) South Rush Creek; (6) Rush Creek above Silver Lake; and (7) Rush Creek below Silver Lake. The gradient of the Project-affected reaches ranges from 0.58 percent on the lower elevation valley floor to 31.82 percent in the steeper mountainous terrain (Figure 8.2-4).

**Stream Locations with Minimum Instream Flow Requirements**

FERC minimum instream flow requirements included in the existing license for the Project are listed in Table 8.2-5. Three locations on Rush Creek (Below Rush Meadows Dam, Below Gem Dam, and Below Agnew Dam) have minimum instream flow requirements. The flow gages at these locations are generally rated to record minimum flow requirements and they record higher flows to varying degrees of accuracy depending on the gage. The gage below Rush Meadows Dam (USGS 10287262) is generally rated accurately up to approximately 30 cubic feet per second (cfs) and higher flows are less accurate. The gage below Gem Dam (USGS 10287281) only records the minimum flow release pipe and spills from the reservoir are not recorded (note: in 2018 and 2019 flows from another release pipe from the dam were recorded). The gage below Agnew Dam (USGS 10287289) is a flume rated for the full range of flows, including spills.

The historical measured minimum flow recordings and associated upstream reservoir storages, which can affect the minimum instream flow requirements/amounts (Table 8.2-5), are shown in Figure 8.2-5, Figure 8.2-6 and Figure 8.2-7 for the below Rush Meadows Dam, Gem Dam, and Agnew Dam sites, respectively. Note that when there is storage in the reservoirs the specified minimum flow release is required (Table 8.2-5), but when the reservoirs are drained, only the natural flow is required (if it is less). Existing and unimpaired flows are shown in Figure 8.2-8, Figure 8.2-9, and Figure 8.2-10 for each of the sites. Refer to Appendix 8.2-A for a description of how unimpaired flows were calculated.

Table 8.2-6 and Table 8.2-7 show the monthly flow statistics for the Below Gem Dam, and Below Agnew Dam sites, respectively, for the pre-seismic (1989–2011) and post-seismic (2012–2023) restriction time periods. The other gage (Below Rush Meadows Dam) has a relatively sporadic record (see Figure 8.2-5), and a summary statistics table was not created.

**Other Stream Locations**

Historical measured and calculated unimpaired flows at two locations, (1) Combined Powerhouse and Rush Creek below Agnew Dam and (2) Rush Creek below Silver Lake, illustrate the effect of the Project on flows in Rush Creek. An average daily time series for the two locations (Figure 8.2-11 and Figure 8.2-12) shows that peak daily flows have historically been slightly reduced by the Project compared to unimpaired flows and that the low flows have typically been augmented by the Project. A mean annual flow time series (Figure 8.2-13 and Figure 8.2-14) shows that the Project operations do not significantly impact the mean annual flow in the system for most years. One exception to this is the 2007/2008 period, when unique Gem Lake operations (geomembrane liner dam repair) resulted in a multi-year redistribution of water (Figure 8.2-13).

Table 8.2-8 and Table 8.2-9 provide monthly flow statistics for the two locations for both the pre-seismic restriction (1989–2011) and post-seismic restriction (2012–2023) time periods. A monthly flow pattern shift in seasonal flows can be seen from the historic operation period (1989–2011) to the current operations with seismic restrictions (2012–2023) (Figures 8.2-15 and Figure 8.2-16). Under seismic restrictions, less flow occurs downstream of the powerhouse in September–February due to the reduced reservoir storage.

### 8.2.5 Monthly Flow Duration Curves and Project Dependable Capacity

Existing and unimpaired mean daily flow duration curves by month (1989–2023) for Below Agnew Dam (USGS 10287289), Rush Creek Powerhouse (USGS 10287300), Combined Powerhouse and Rush Creek below Agnew Dam (USGS 10287289 and USGS 10287300 combined), and Rush Creek below Silver Lake (USGS 10287400) are shown in Appendix 8.2-B. Figures 8.2-17 through 8.2-20 show summary monthly exceedances for existing and unimpaired flows at each of the sites.

During a period of high energy demand (July/August of a low water year) the powerhouse could operate at a plant capacity factor of approximately 0.9 (90 percent) for a period of days or weeks. The short-term Rush Creek Powerhouse dependable capacity is 11.7 megawatts (MW) (90 percent of the installed powerhouse capacity of 13.01 MW).

The Rush Creek Powerhouse dependable capacity under current operations for a full year is 18,047 megawatt hours (2.06 MW, 16 percent of installed capacity) based on generation records from 2015. This year was chosen to calculate dependable capacity because it represented the lowest project inflow year (2012–2023).

### 8.2.6 Existing Water Uses

Beneficial uses that apply to surface waters within the river basin are identified in the Water Quality Control Plan for the Lahontan Region, North and South Basins (Basin Plan) (CRWQCB 2021). Beneficial uses that pertain to upper Rush Creek, above Grant Lake, include: (1) municipal and domestic supply; (2) freshwater replenishment; (3) hydropower generation; (4) water contact recreation; (5) noncontact water recreation; (6) commercial and sport fishing; (7) cold freshwater habitat; (8) wildlife habitat; and (9) spawning, reproduction, and development. The Basin Plan also identifies beneficial uses that pertain to Rush Creek below Grant Lake which include: all benefits listed previously for upper Rush Creek except for (3) hydropower generation; and includes (10) agricultural supply; and (11) groundwater recharge.

#### 8.2.6.1 Hydropower Uses

SCE operates the Rush Creek Project for hydroelectric generation. There are no other hydropower uses in the Rush Creek Basin. The Rush Creek Powerhouse has a total installed capacity of 13.01 MW with two generating units (Unit No. 1 – General Electric, 5,850 kilowatt [kW]; Unit No. 2 – Allis Chalmers, 7,161 kW). The units have a combined maximum hydraulic capacity of approximately 110 cfs and minimum capacity of 5 cfs; however, historic maximum flow through the powerhouse is typically 100–105 cfs. The Rush Creek Powerhouse (elevation 7,247 feet) has two penstocks with an intake at Gem Dam (elevation 8,964 feet). The water travels through a closed penstock from Gem Dam to the Agnew Valve House (elevation 4,280 feet). From the Agnew Valve House, two penstocks then transport the water to Rush Creek Powerhouse. The powerhouse is run at full capacity during high-flow runoff events and, at other times, the flow is regulated to lower flows depending on the amount of water available (see Figure 8.2-2 and Figure 8.2-21).

#### 8.2.6.2 Domestic, Municipal, and Agricultural Uses

There are no consumptive uses of water from Rush Creek upstream of the powerhouse. A minor amount of consumptive use occurs at the Rush Creek Powerhouse, supplied by the June Lake Public Utility District (JLPUD) from the Reversed Creek/June Lakes sub-basin. JLPUD has about 660 customers for water and sewer services, and its boundaries include about 1,720 acres of unincorporated residential, commercial, and undeveloped land mainly in the June Lakes/Reversed Creek sub-basin. Water for the JLPUD is provided from a diversion dam at Snow Creek, an intake facility in June Lake, and diversions from Fern and Yost creeks (JLPUD 2021).

From Silver Lake downstream, there is a small amount of consumptive water use from the homes and recreational facilities along the Silver Lake shoreline (JLPUD, wells, springs, Alger Creek), but the major consumer of water in the Rush Creek river basin is the City of Los Angeles, which diverts water out of the lower Rush Creek river basin (and the larger Mono Basin) from Grant Lake, Parker Creek, and Walker Creek via the Los Angeles Aqueduct for domestic uses. The water diversions are regulated by Water Board Decision D1631 (limits water exports from Mono Basin) to establish fisheries protection flows for streams tributary to Mono Lake and to protect public trust resources at Mono Lake and in the Mono Basin (LADWP 2020).

#### 8.2.6.3 Recreation

Near the Project (Rush Creek near the powerhouse and upstream), recreational uses identified in the Basin Plan include water contact and noncontact recreation and sport fishing (CRWQCB 2021). Dispersed recreation (camping and fishing) occurs at Agnew Lake, Gem Lake, Waugh Lake and along Rush Creek. There are no roads in the vicinity of the Project (above the valley floor) and recreation is accessed only by hiking or horseback. Downstream of the powerhouse (including the June Lakes/Reversed Creek drainage) there is easier recreational access (roads) and the non-Project lakes (June, Gull, Silver, Grant) and Rush Creek are popular for contact/noncontact recreation and sport fishing (see Section 8.10, Recreation).

#### 8.2.6.4 Aquatic and Wildlife Habitats

Near the Project (Rush Creek near the powerhouse and upstream) beneficial uses identified in the Basin Plan (CRWQCB 2021) include cold freshwater habitat, wildlife habitat, spawning, reproduction, and development, which are all applicable to Waugh Lake, Gem Lake, Agnew Lake, and Rush Creek. Downstream of the powerhouse (including the June Lakes/Reversed Creek drainage), Rush Creek, tributary streams, and non-Project lakes (June, Gull, Silver, Grant) provide aquatic and wildlife habitats (see Section 8.4, Fish and Aquatic Resources and Section 8.5, Botanical and Wildlife Resources).

### 8.2.7 Existing Instream Water Uses and Water Rights

#### 8.2.7.1 Instream Uses Affected by the Project

Near the Project, instream water uses, other than the Project water storage and power generation, are primarily aquatic habitat and recreation. There are no other stream water users. Instream flow water uses are affected by the Project, or potentially affected, in seven reaches of Rush Creek or South Rush Creek (a small distributary of Rush Creek) (Table 8.1-3 and Map 8.1-2). This does not include the reservoir inundated or seasonally reservoir inundated reaches. Four of the seven stream reaches are bypass reaches (flow is diverted around the reach by the Project) and three of the stream reaches are flow-affected reaches (flow timing in the reach is altered by the Project). Three of the reaches (Rush Creek below Gem Dam, Rush Creek below Agnew Dam, and Rush Creek Horsetail Falls) are very steep gradient, between 11.7 percent and 31.8 percent (Figure 8.2-4), and consist of falls with some plunge pools, bedrock/coarse substrate, and limited aquatic habitat (non-adjustable channels in relation to flow modification). The other reaches are low to moderate gradient and provide better aquatic habitat and portions of their channels have finer substrate and are adjustable in relation to flow modifications. Both existing and unimpaired flow time series plots (1989–2023) are provided in Section 8.2.4.3 for each of the reaches.

#### 8.2.7.2 Water Rights

SCE currently has three water rights permits and three licenses issued by the State Water Board related to the Project. These appropriative water rights permits, and licenses allow for the diversion and storage of water for power production at Agnew, Gem, and Rush Meadows dams. One permit allows for the diversion of water from Gem Dam for domestic use. Table 8.2-10 summarizes SCE's water rights permits and licenses for the Project.

### 8.2.8 References

CRWQCB (California Regional Water Quality Control Board) Lahontan Region. 2021. Water Quality Control Plan for the Lahontan Region, North and South Basins (Basin Plan). Revised September 2021. Available at: https://www.waterboards.ca.gov/lahontan/water_issues/programs/basin_plan/references.html.

FERC (Federal Energy Regulatory Commission). 2016. Plan and Schedule for the Seismic Retrofit of the Rush Creek Project. FERC Accession No. 20161108-0178. October 27.

JLPUD (June Lake Public Utility District). 2021. Available at: https://www.junelakepud.com/about-us.

LADWP (Los Angeles Department of Water and Power). 2020. Draft LADWP Urban Water Management Plan. Available at: http://ladwp.com/UWMP.

USGS (United States Geologic Survey). 1995. Storage Capacity, Detention Time and Selected Sediment Deposition Characteristics for Gull and Silver Lakes, Mono County, California. Available at: https://pubs.usgs.gov/of/1995/0702/report.pdf.

USGS Flow Data (A complete list of sites used for this analysis is provided in Table 8.2-1) Available at: https://waterdata.usgs.gov/nwis.

# TABLES

## Table 8.2-1. Hydrology Data Sources

| Location | Entity and Station No. | Data Type | Period of Record | Notes | Data Use | Location (NAD27) | Drainage Area (Square Miles) | Elevation (Feet above NGVD29) |
|---|---|---|---|---|---|---|---|---|
| **Waugh Lake** | | | | | | | | |
| Waugh Lk near June Lk CA | SCE 359 & USGS 10287260 | Daily Storage | 10/01/1989–Present | Full Record Available | Unimpaired Calculation | Latitude 37°45'04", Longitude 119°10'52" | 15.3 | 9,370 |
| **Rush Creek below Rush Meadows Dam (Rush Creek below Waugh Lake)** | | | | | | | | |
| Rush C controlled release below Waugh Lk near June Lake CA | SCE 359 R & USGS 10287262 | Daily Flow | 08/11/1999–Present | Spotty data — no flows recorded above 30 cfs | Comparison Only | Latitude 37°45'04", Longitude 119°10'50" | 15.3 | 9,375 |
| **Gem Lake** | | | | | | | | |
| Gem Lake | SCE 352 & USGS 10287280/CDEC GLK | Daily Storage | 10/01/1989–Present | Full Record Available | Unimpaired Calculation | Latitude 37°45'07", Longitude 119°08'25" | 21.9 | 8,970 |
| **Rush Creek below Gem Dam (Rush Creek below Gem Lake)** | | | | | | | | |
| Rush C controlled release below Gem Lake near June Lake, CA | SCE 352 R & USGS 10287281 | Daily Flow | 10/19/1999–Present | Full Record Available | Comparison Only | Latitude 37°45'05", Longitude 119°08'26" | 21.9 | 9,000 |
| **Agnew Lake** | | | | | | | | |
| Agnew Lake near June Lake, CA | SCE 351 & USGS 10287285 | Daily Storage | 10/01/1989–Present | Full Record Available | Unimpaired Calculation | Latitude 37°45'30", Longitude 119°07'52" | 23.2 | 8,470 |

| Location | Entity and Station No. | Data Type | Period of Record | Notes | Data Use | Location (NAD27) | Drainage Area (Square Miles) | Elevation (Feet above NGVD29) |
|---|---|---|---|---|---|---|---|---|
| **Rush Creek below Agnew Dam (Rush Creek at Flume below Agnew)** | | | | | | | | |
| Rush Creek at Flume below Agnew Lake near June Lake, CA | SCE 357 & USGS 10287289 | Daily Flow | 10/01/1988–Present | Full Record Available | Unimpaired Calculation | Latitude 37°45'33", Longitude 119°07'47" | 23.2 | 8,440 |
| **Rush Creek Powerhouse (Rush Creek PP tailrace)** | | | | | | | | |
| Rush Creek PP tailrace near June Lake, CA | SCE 367 & USGS 10287300 | Daily Flow | 10/01/1986–Present | Full Record Available | Unimpaired Calculation | Latitude 37°45'59", Longitude 119°07'17" | 23.2 | 7,230 |
| **Rush Creek below Silver Lake (Rush Creek above Grant Lake)** | | | | | | | | |
| Rush Creek ab Grant Lake near June Lake, CA | LADWP MS 5013 & USGS 10287400 | Daily Flow | 10/01/1986–Present | Pre-1990 Monthly Data | Unimpaired Calculation | Latitude 37°48'23", Longitude 119°06'29" | 51.3 | 7,200 |
| **Grant Lake** | | | | | | | | |
| Grant Lake | CDEC GNT | Monthly Storage | 01/01/1956–Present | Monthly Data, CDEC | Comparison Only | Latitude 37°51'43.2", Longitude 119°6'7.2" | 58.5 | 7,140 |
| **Walker River** | | | | | | | | |
| Walker River | USGS 10296000 | Daily Flow | 04/01/1938–Present | Full Record Available | Comparison and Gap Filling | Latitude 38°22'47", Longitude 119°26'57" | 181 | 6,591 |

Notes:

CDEC GNT = California Data Exchange Center Grant Lake Station (GNT)
LADWP MS 5013 = Los Angeles Department of Water and Power Measuring Station 5013
NAD27 = North American Datum of 1927
NGVD29 = National Geodetic Vertical Datum of 1929
PP = Powerplant
SCE = Southern California Edison Company
USGS = U.S. Geological Survey

## Table 8.2-2. FERC Elevation Requirements for Waugh, Gem, and Agnew Lakes, Including Current Seismic Restrictions

| Reservoir | Current License Elevation Requirement (but Superseded by Current Seismic Restrictions) | Seismic Restrictions (Maximum Elevation, Feet) |
|---|---|---|
| **Waugh Lake** | | |
| Regular Water Years | Within 2 feet of spillway elevation (9,416 feet) July 1 to the Tuesday following Labor Day weekend[1] | 9,392.1 feet |
| Low Water Years (<75% of the April 1 snow water equivalent for the Mono Basin) | Within 3 feet of spillway elevation (9,416 feet) July 1 to the Tuesday following Labor Day weekend[2] | |
| **Gem Lake** | | |
| Regular Water Years | Within 2 feet of spillway elevation (9,052 feet) July 1 to the Tuesday following Labor Day weekend[1] | 9,027.5 feet |
| Low Water Years (<75% of the April 1 snow water equivalent for the Mono Basin) | Within 6 feet elevation (9,052 feet) July 1 to the Tuesday following Labor Day weekend[2] | |
| **Agnew Lake** | | |
| All Water Years | Within 15 feet of spillway elevation (8,496 feet) July 1 to the Tuesday following Labor Day weekend | Completely Drained (8,470.0 feet) |

Notes:

[1] Licensee may maintain reduced lake levels when necessary to avoid the spill of water from Gem Lake at potentially damaging volumes. In such event, Licensee shall cause the water level in Waugh and Gem Lakes to reach 2 feet below the spillway elevations as soon as practicable after July 1.

[2] To the extent sufficient water is available to meet (i) minimum stream flow requirements required in Forest Service 4(e) Condition No. 5, and (ii) a target 14 cubic feet per second release from the project powerhouse, based on plant operational minimums.

Key: FERC = Federal Energy Regulatory Commission

## Table 8.2-3. Reservoir/Lake Physical Data

| Reservoir/Lake | Surface Area (acres) | Gross Storage Volume (acre-feet) | Max Operating Water Surface Elevation/ High Water Mark (feet) | Max Depth (feet) | Mean Depth (feet) | Flushing Rate (days) | Shoreline Length (miles) | Substrate Composition |
|---|---|---|---|---|---|---|---|---|
| **Waugh Lake** | | | | | | | | |
| Pre-2012 Specifications | 185 | 5,277 | 9,416 | 47 | 28.5 | 72 | 4.57 | Silt, Sand, Rock, Bedrock |
| Post-2012 Specifications | 130 | 1,555 | 9,392 | 23.5 | 12.0 | 21 | 4.40 | Silt, Sand, Rock, Bedrock |
| **Gem Lake** | | | | | | | | |
| Pre-2012 Specifications | 282 | 17,228 | 9,052 | 78 | 61.1 | 150 | 4.53 | Silt, Sand, Rock, Bedrock |
| Post-2012 Specifications | 256 | 10,752 | 9,027.5 | 54 | 42 | 94 | 4.63* | Silt, Sand, Rock, Bedrock |
| **Agnew Lake** | | | | | | | | |
| Pre-2012 Specifications | 40 | 1,379 | 8,496 | unknown | 34.5 | 55 | 1.39 | Silt, Sand, Rock, Bedrock |
| Post-2012 Specifications** | 23 | 569 | 8,470 | unknown | 24.7 | 23 | 1.24 | Silt, Sand, Rock, Bedrock |

Notes:

* 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.

## Table 8.2-4. Monthly Mean and Maximum Flows (cfs) through Rush Creek Powerhouse (SCE 367 / USGS 10287300)

| Month | Rush Creek Powerhouse Flows (cfs) | | | |
|---|---|---|---|---|
| | Historic Operations WY 1990–2011 | | Operations with Seismic Restrictions WY 2012–2023 | |
| | Mean | Maximum | Mean | Maximum |
| October | 53 | 104 | 26 | 79 |
| November | 42 | 102 | 23 | 100 |
| December | 35 | 79 | 22 | 102 |
| January | 37 | 96 | 16 | 81 |
| February | 40 | 102 | 26 | 105 |
| March | 45 | 102 | 34 | 104 |
| April | 36 | 101 | 29 | 107 |
| May | 54 | 106 | 47 | 108 |
| June | 61 | 104 | 67 | 113 |
| July | 63 | 106 | 57 | 106 |
| August | 42 | 106 | 39 | 105 |
| September | 49 | 103 | 24 | 102 |

Key: cfs = cubic feet per second
WY = water year

## Table 8.2-5. FERC Instream Flow Requirements for the Rush Creek Project included in the Existing License

| Rush Creek Location | Instream Flow Requirement (cfs) | Measurement Gage |
|---|---|---|
| Below Rush Meadows (Waugh Lake) Dam | 10 cfs or natural flow into Waugh Lake, whichever is less | SCE 359 R and USGS 10287262 |
| Below Gem Dam | 1 cfs or natural flow if the reservoir falls below the face of the dam | SCE 352 R and USGS 10287281 |
| Below Agnew Dam | 1 cfs or natural flow if the reservoir falls below the face of the dam | SCE 357 and USGS 10287289 |

Key: cfs = cubic foot/feet per second
FERC = Federal Energy Regulatory Commission
SCE = Southern California Edison Company
USGS = U.S. Geological Survey

**Table 8.2-6. Monthly Mean, Minimum, and Maximum Rush Creek Flows (cfs) Below Gem Dam (Flow Gage Records Minimum Flows Only), for the Pre-seismic (WY 2000–2011) and Post-seismic (WY 2012–2023) Restriction Time Periods (SCE 352 R/USGS 10287281)**

| Month | Flow below Gem Dam (cfs) | | | | | |
|---|---|---|---|---|---|---|
| | Historic Operations WY 2000*–2011 | | | Operations with Seismic Restrictions WY 2012–2023 | | |
| | Mean | Min | Max | Mean | Min | Max |
| October | 1.7 | 1.0 | 6.7 | 1.4 | 1.1 | 2.0 |
| November | 1.2 | 1.0 | 1.4 | 1.7 | 1.1 | 6.3 |
| December | 1.3 | 1.0 | 1.5 | 1.8 | 1.1 | 6.0 |
| January | 1.2 | 1.0 | 1.5 | 1.4 | 1.0 | 5.5 |
| February | 1.3 | 1.0 | 2.0 | 1.4 | 1.1 | 1.7 |
| March | 1.3 | 1.1 | 2.0 | 1.4 | 1.0 | 4.4 |
| April | 1.3 | 0.0[1] | 2.6 | 4.7 | 1.0 | 128.0 |
| May | 2.0 | 1.0 | 5.8 | 18.4 | 1.0 | 148.0 |
| June | 2.7 | 1.2 | 7.1 | 19.2 | 1.0 | 154.0 |
| July | 2.3 | 1.2 | 7.0 | 7.7 | 1.0 | 133.0 |
| August | 1.5 | 1.0 | 7.0 | 1.6 | 1.0 | 5.6 |
| September | 1.9 | 1.2 | 6.9 | 17.0 | 1.0 | 236.0 |

Notes:

* Facilities to release new minimum flow requirements were completed at end of calendar year 1999.

[1] A two-week period of 0.0 cfs was recorded in April of 2000 when Gem Lake storage was zero – low level minimum flow pipe was likely not functional at this storage level. Flows in the stream may have occurred during this period that were not recorded by the minimum flow gage.

Key: cfs = cubic feet per second
WY = water year

**Table 8.2-7. Monthly Mean, Minimum, and Maximum Rush Creek Flows (cfs) Below Agnew Dam Flume for the Pre-seismic (WY 2000–2011) and Post-seismic (WY 2012–2023) Restriction Time Periods (SCE 357/USGS 10287289)**

| | Flume below Agnew Dam (cfs) | | | | | |
|---|---|---|---|---|---|---|
| | Historic Operations WY 2000*–2011 | | | Operations with Seismic Restrictions WY 2012–2023 | | |
| Month | Mean | Min | Max | Mean | Min | Max |
| October | 11.6 | 0.0[1] | 178.0 | 2.1 | 0.7 | 15.0 |
| November | 5.3 | 0.2[2] | 57.0 | 2.1 | 1.0 | 12.0 |
| December | 6.7 | 1.3 | 57.0 | 2.3 | 0.9 | 15.0 |
| January | 2.3 | 1.4 | 4.5 | 3.7 | 0.9 | 51.0 |
| February | 2.3 | 1.4 | 7.0 | 2.8 | 0.8 | 23.0 |
| March | 2.5 | 1.6 | 4.1 | 3.2 | 1.0 | 34.0 |
| April | 2.9 | 1.2 | 8.2 | 12.6 | 1.6 | 172.0 |
| May | 4.9 | 1.3 | 49.0 | 45.3 | 1.9 | 218.0 |
| June | 55.9 | 1.5 | 223.0 | 80.7 | 1.4 | 440.0 |
| July | 48.8 | 1.4 | 348.0 | 62.6 | 1.2 | 407.0 |
| August | 7.3 | 1.4 | 254.0 | 3.4 | 1.2 | 147.0 |
| September | 4.6 | 1.4 | 52.0 | 2.2 | 0.8 | 25.0 |

Notes:

* Facilities to release new minimum flow requirements were completed at end of calendar year 1999.

[1] Zero flow recorded in flume below Agnew on 10/22/2007 – Agnew Lake was NOT at dead pool.

[2] 0.2 cfs was recorded in flume below Agnew in November, 2006 which coincides with Agnew Lake at dead pool.

Key: cfs = cubic feet per second
WY = water year

**Table 8.2-8. Existing and Unimpaired Monthly Mean, Minimum, and Maximum Flows (cfs) for the Combined Rush Creek Below Agnew Dam and Rush Creek Powerhouse (Top Table: Historical Operations [WY 2000–2011], Bottom Table: Operations with Seismic Restrictions [WY 2012–2023]) (USGS 10287289 and USGS 10287300)**

| Month | Combined Rush Creek below Agnew Dam and Rush Creek Powerhouse Historical Operations (WY 2000–2011) | | | | | |
|---|---|---|---|---|---|---|
| | Existing Flows (cfs) | | | Unimpaired Flows (cfs) | | |
| | Mean | Min | Max | Mean | Min | Max |
| October | 61.9 | 7.2 | 279.0 | 12.5 | 1.0 | 283.7 |
| November | 49.2 | 4.7 | 104.9 | 7.5 | 1.0 | 34.7 |
| December | 39.1 | 4.8 | 81.0 | 7.2 | 1.0 | 37.0 |
| January | 35.6 | 4.8 | 54.5 | 8.7 | 1.0 | 32.4 |
| February | 41.1 | 2.8 | 104.7 | 9.7 | 1.0 | 43.9 |
| March | 49.7 | 2.8 | 104.8 | 13.9 | 1.0 | 58.4 |
| April | 36.7 | 2.5 | 103.7 | 46.0 | 7.8 | 184.6 |
| May | 53.4 | 5.0 | 152.0 | 200.2 | 18.7 | 602.8 |
| June | 115.2 | 13.8 | 327.0 | 243.1 | 24.3 | 826.9 |
| July | 107.8 | 1.5 | 435.0 | 122.3 | 2.5 | 679.5 |
| August | 35.3 | 6.1 | 308.0 | 25.8 | 1.8 | 235.2 |
| September | 46.2 | 5.1 | 106.5 | 9.3 | 0.6 | 50.4 |

| Month | Combined Rush Creek below Agnew Dam and Rush Creek Powerhouse Operations with Seismic Restrictions (WY 2012–2023) | | | | | |
|---|---|---|---|---|---|---|
| | Existing Flows (cfs) | | | Unimpaired Flows (cfs) | | |
| | Mean | Min | Max | Mean | Min | Max |
| October | 25.9 | 5.1 | 81.6 | 12.3 | 1.0 | 433.5 |
| November | 24.8 | 1.5 | 102.6 | 9.1 | 1.0 | 182.5 |
| December | 26.3 | 1.5 | 110.0 | 10.0 | 1.0 | 79.9 |
| January | 20.0 | 1.0 | 84.4 | 9.5 | 1.0 | 47.3 |
| February | 28.2 | 1.2 | 108.7 | 13.1 | 1.0 | 228.5 |
| March | 37.2 | 4.6 | 107.1 | 19.2 | 1.0 | 79.8 |
| April | 42.0 | 3.7 | 251.0 | 69.4 | 5.9 | 484.0 |
| May | 92.8 | 5.0 | 321.0 | 170.6 | 38.3 | 517.3 |
| June | 147.2 | 1.7 | 541.0 | 187.9 | 20.4 | 910.4 |
| July | 119.8 | 1.2 | 508.0 | 105.9 | 3.9 | 676.8 |
| August | 42.0 | 4.0 | 251.0 | 34.1 | 1.0 | 289.4 |
| September | 26.3 | 3.5 | 104.4 | 13.3 | 1.0 | 260.3 |

Key: cfs = cubic feet per second
WY = water year

**Table 8.2-9. Existing and Unimpaired Monthly Mean, Minimum, and Maximum Flows (cfs) in Rush Creek below Silver Lake (Top Table: Historical Operations [WY 2000–2011], Bottom Table: Operations with Seismic Restrictions [WY 2012–2019]) (LADWP MS 5013/USGS 10287400)**

| Month | Rush Creek below Silver Lake Historical Operations (WY 2000–2011) | | | | | |
|---|---|---|---|---|---|---|
| | Existing Flows (cfs) | | | Unimpaired Flows (cfs) | | |
| | Mean | Min | Max | Mean | Min | Max |
| October | 71.6 | 13.6 | 265.0 | 20.8 | 1.4 | 274.9 |
| November | 60.5 | 8.9 | 131.0 | 16.9 | 1.7 | 57.8 |
| December | 51.1 | 9.2 | 121.0 | 18.6 | 3.9 | 114.6 |
| January | 48.3 | 10.4 | 92.0 | 20.7 | 6.5 | 88.1 |
| February | 54.1 | 11.0 | 120.1 | 22.1 | 9.2 | 101.7 |
| March | 67.9 | 17.9 | 138.0 | 32.2 | 11.1 | 96.2 |
| April | 65.1 | 21.0 | 137.0 | 75.5 | 20.7 | 240.0 |
| May | 117.7 | 32.7 | 328.0 | 268.5 | 37.0 | 745.7 |
| June | 187.0 | 22.6 | 483.0 | 317.9 | 33.6 | 1072.9 |
| July | 142.4 | 15.2 | 478.0 | 159.4 | 16.2 | 736.9 |
| August | 47.1 | 9.4 | 373.0 | 38.9 | 6.3 | 491.4 |
| September | 53.3 | 11.3 | 112.0 | 15.7 | 2.1 | 61.6 |

| Month | Rush Creek below Silver Lake Historical Operations with Seismic Restrictions (WY 2012–2023) | | | | | |
|---|---|---|---|---|---|---|
| | Existing Flows (cfs) | | | Unimpaired Flows (cfs) | | |
| | Mean | Min | Max | Mean | Min | Max |
| October | 27.3 | 4.5 | 93.0 | 17.5 | 1.3 | 441.5 |
| November | 28.4 | 7.5 | 99.6 | 14.7 | 1.2 | 190.5 |
| December | 30.4 | 6.3 | 138.0 | 17.4 | 2.0 | 87.9 |
| January | 27.6 | 5.6 | 125.0 | 18.4 | 2.4 | 126.2 |
| February | 36.3 | 5.1 | 199.0 | 24.8 | 3.0 | 304.1 |
| March | 47.3 | 7.3 | 115.4 | 31.8 | 2.5 | 102.9 |
| April | 62.5 | 13.5 | 277.1 | 90.8 | 12.0 | 552.8 |
| May | 134.0 | 18.5 | 487.5 | 217.9 | 57.2 | 668.8 |
| June | 194.7 | 11.1 | 721.7 | 243.9 | 33.6 | 1102.1 |
| July | 140.7 | 7.5 | 638.4 | 134.9 | 9.1 | 835.1 |
| August | 48.9 | 4.4 | 294.3 | 46.2 | 5.3 | 304.4 |
| September | 28.1 | 4.3 | 106.2 | 20.8 | 1.5 | 217.7 |

Key: cfs = cubic feet per second
WY = water year

## Table 8.2-10. Summary of Appropriative Water Rights

| Permit/ License No. | Type of Use | Status | Location | Direct Diversion Rate | | Diversion to Storage | |
|---|---|---|---|---|---|---|---|
| | | | | Amount | Timing | Amount | Timing |
| 000025 | Power | Licensed | Gem Dam | 40 cfs | Jan 1 – Dec 31 | – | – |
| | | | Agnew Dam | 40 cfs | Jan 1 – Dec 31 | – | – |
| 000061 | Power | Licensed | Rush Meadows Dam | – | – | 3,763 gpd | Jan 1 – Dec 31 |
| 000564 | Power | Licensed | Rush Meadows Dam | 10 cfs | Jan 1 – Dec 31 | 1,742 ac-ft | Jan 1 – Dec 31 |
| 020895[a] | Power | Permitted | Agnew Dam | 45 cfs | Jan 1 – Dec 31 | 1,678 ac-ft | Jan 1 – Dec 31 |
| 020896[b] | Domestic | Permitted | Gem Dam | – | – | 1,611 gpd | Jan 1 – Dec 31 |
| 020897[c] | Power | Permitted | Gem Dam | 60 cfs | Jan 1 – Dec 31 | 19,687 ac-ft | Jan 1 – Dec 31 |

Notes:

[a.] Total amount of water to be taken from the source shall not exceed 3,358 ac-ft per water year of October 1 to September 30.

[b.] The maximum amount diverted under this permit shall not exceed 1.7 ac-ft per year.

[c.] The total amount of water to be taken from the source shall not exceed 63,125 ac-ft per water year of October 1 to September 30.

Key: ac-ft = acre-feet
cfs = cubic feet per second
gpd = gallons per day

# FIGURES

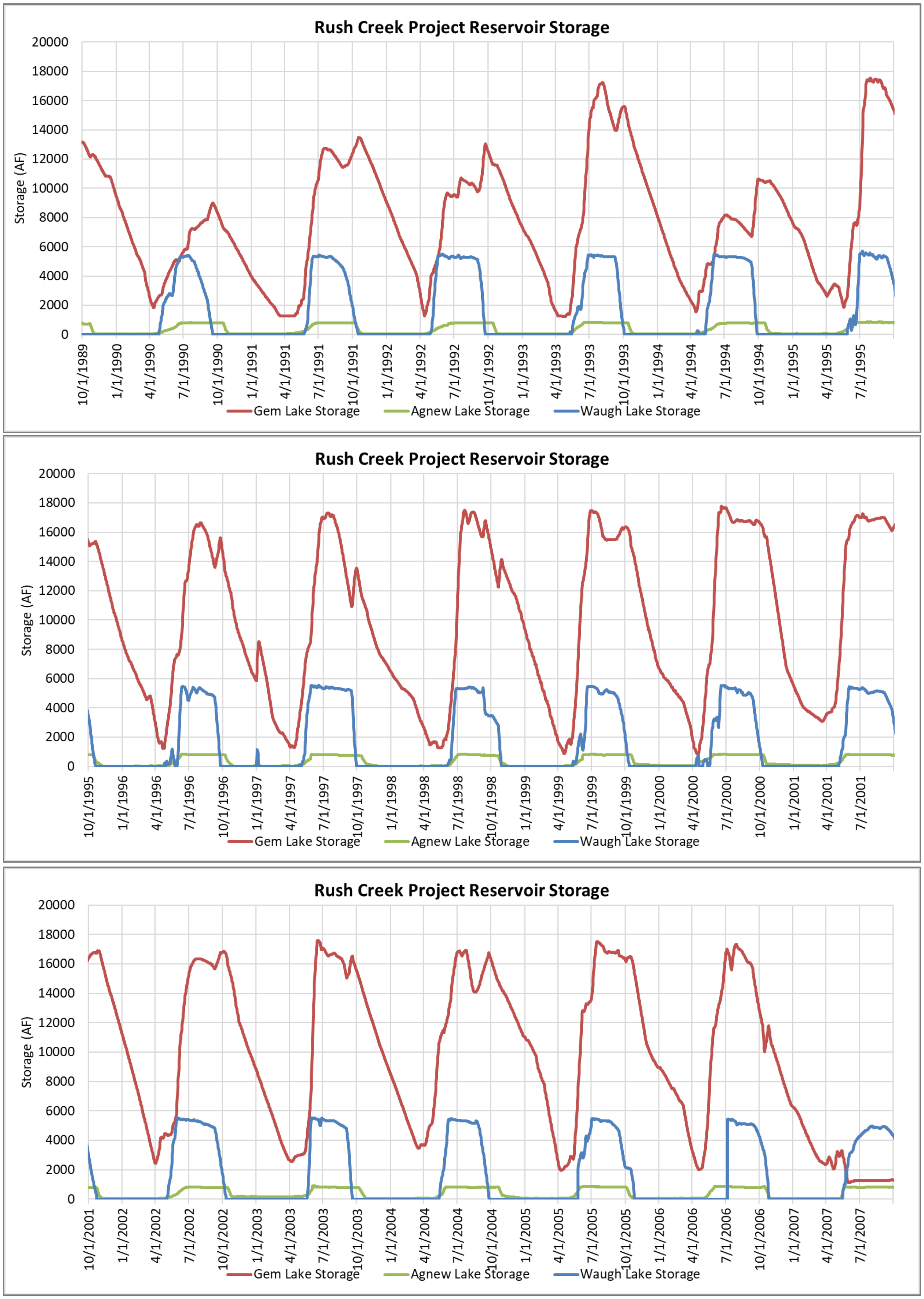



**Figure 8.2-1. Rush Creek Project Reservoir Storage (WY 1990–2023)**

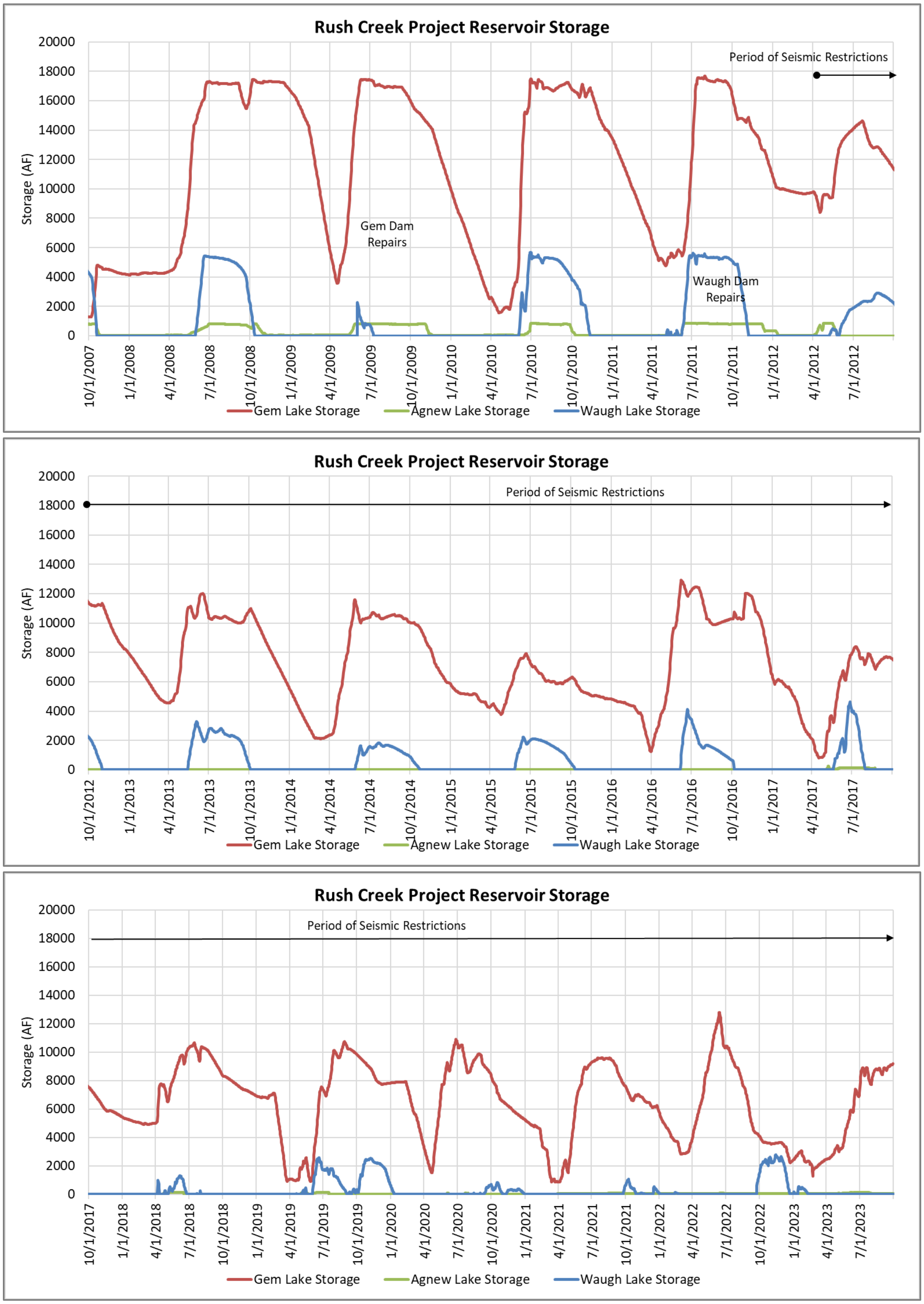



***Figure 8.2-1 (continued). Rush Creek Project Reservoir Storage (WY 1990–2023)***

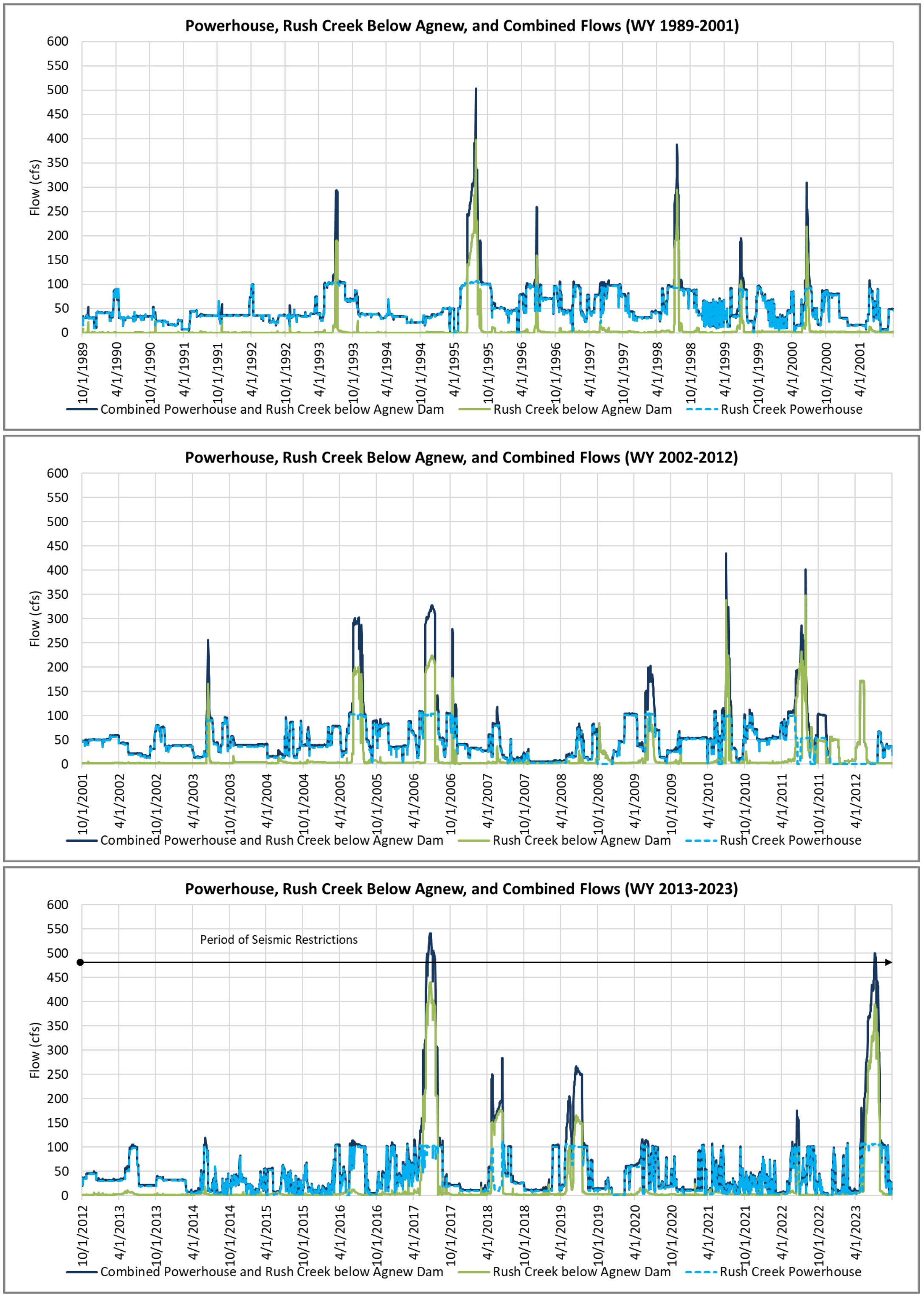
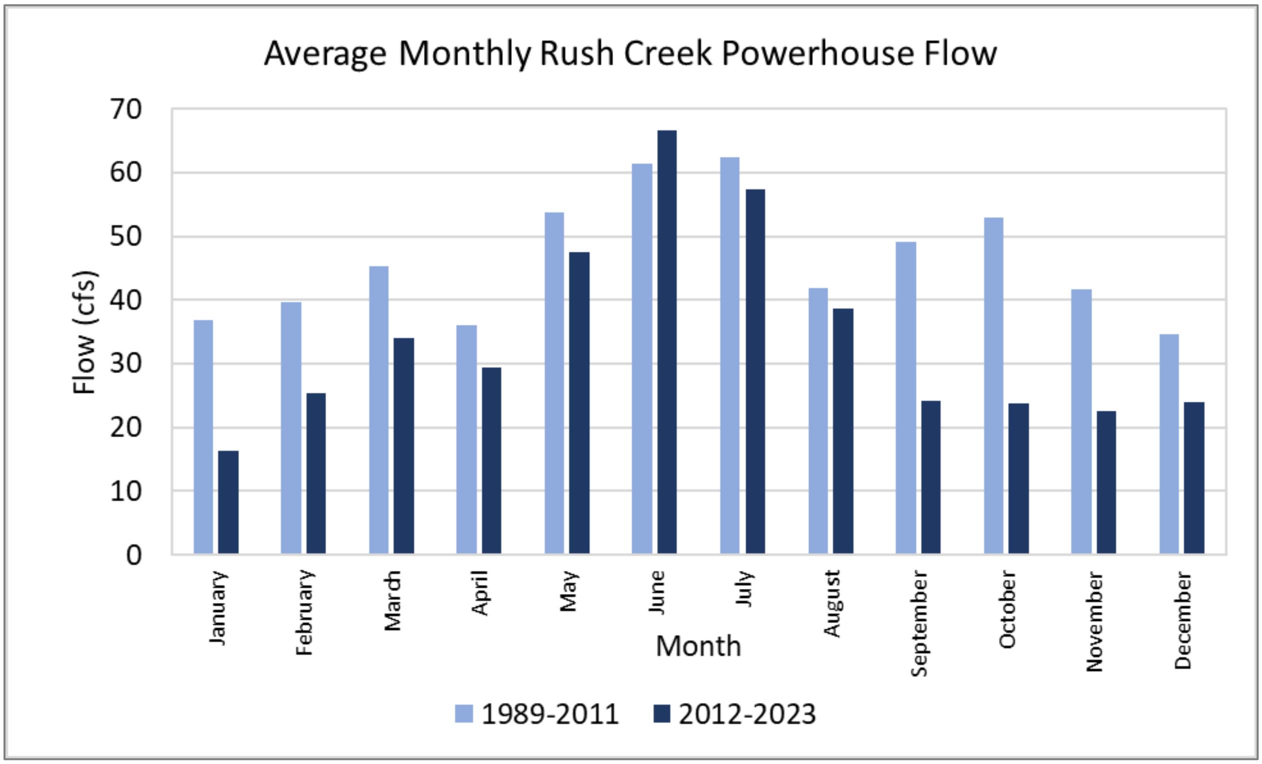



**Figure 8.2-2. Daily Mean Flow (WY 1990 to 2023) at the Rush Creek Powerhouse (SCE 367/USGS 10287300), Rush Creek below Agnew Dam (SCE 357/USGS 10287289), and the Locations Combined (Combined Powerhouse and Rush Creek Below Agnew Dam)**



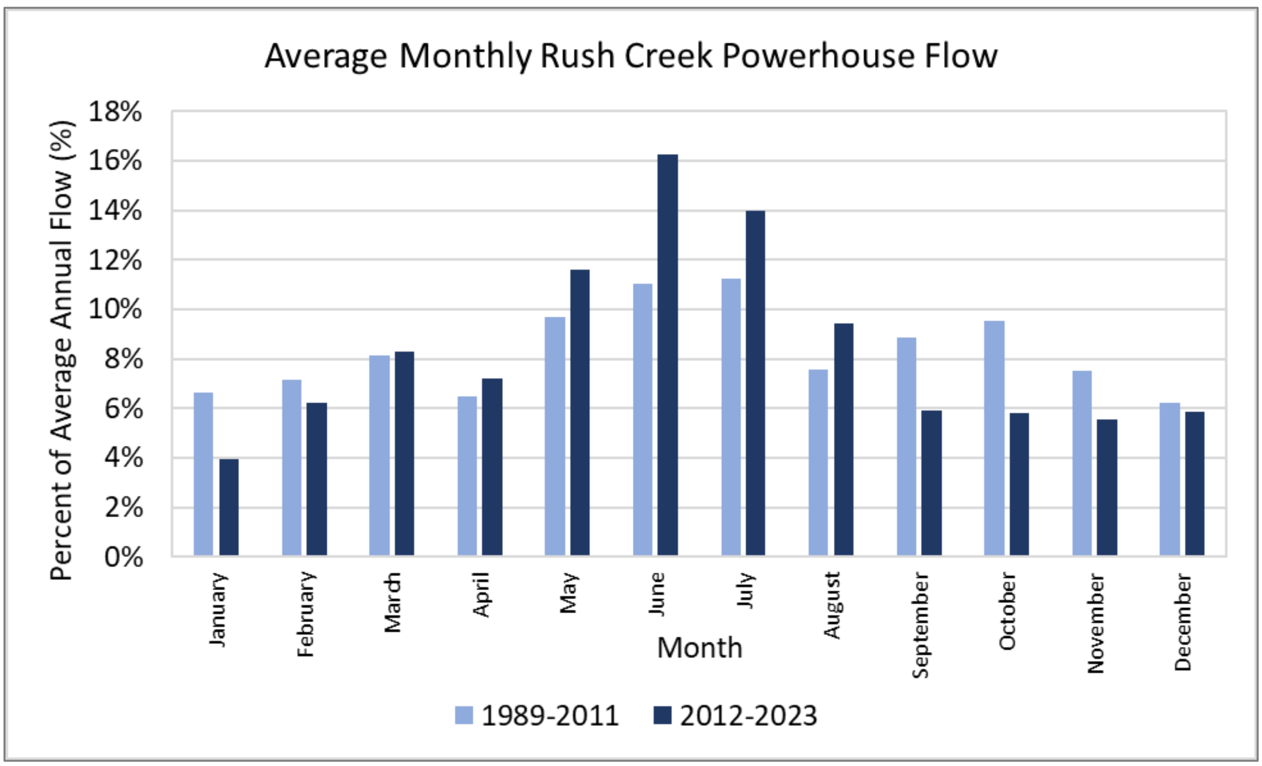




**Figure 8.2-3. Average Monthly Powerhouse Flows [Top Graph: Flow in cubic feet per second (cfs); Bottom Graph: Percentage of Average Annual Flow] (SCE 367/USGS 10287300)**

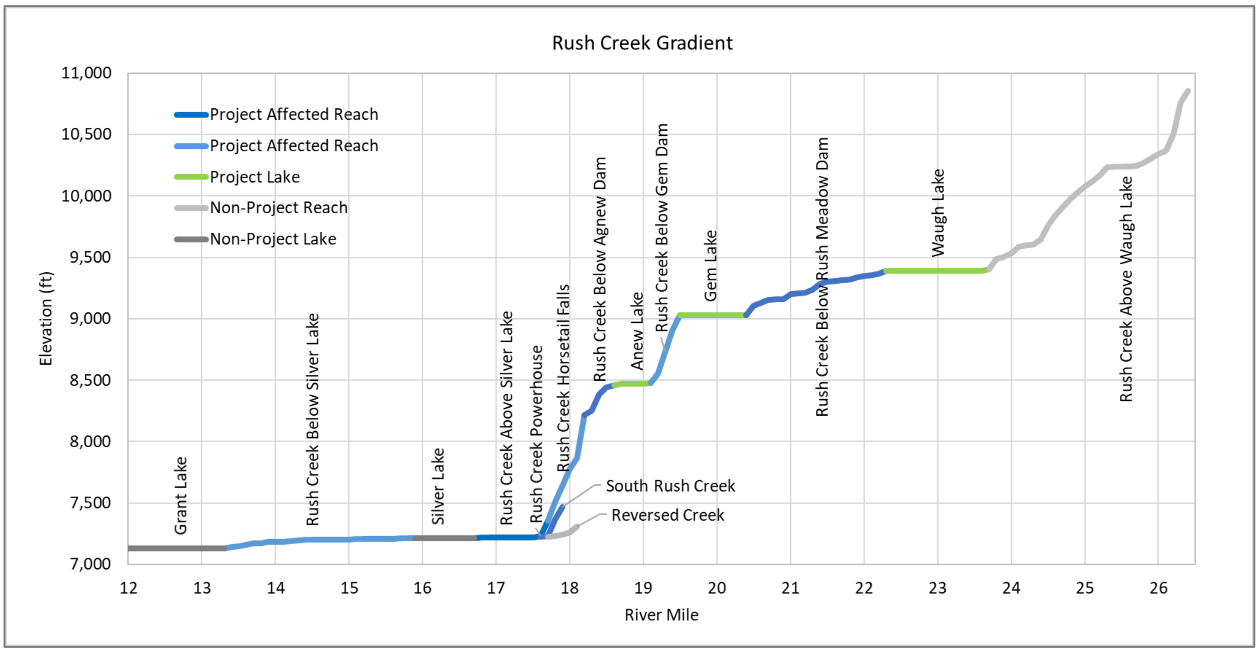
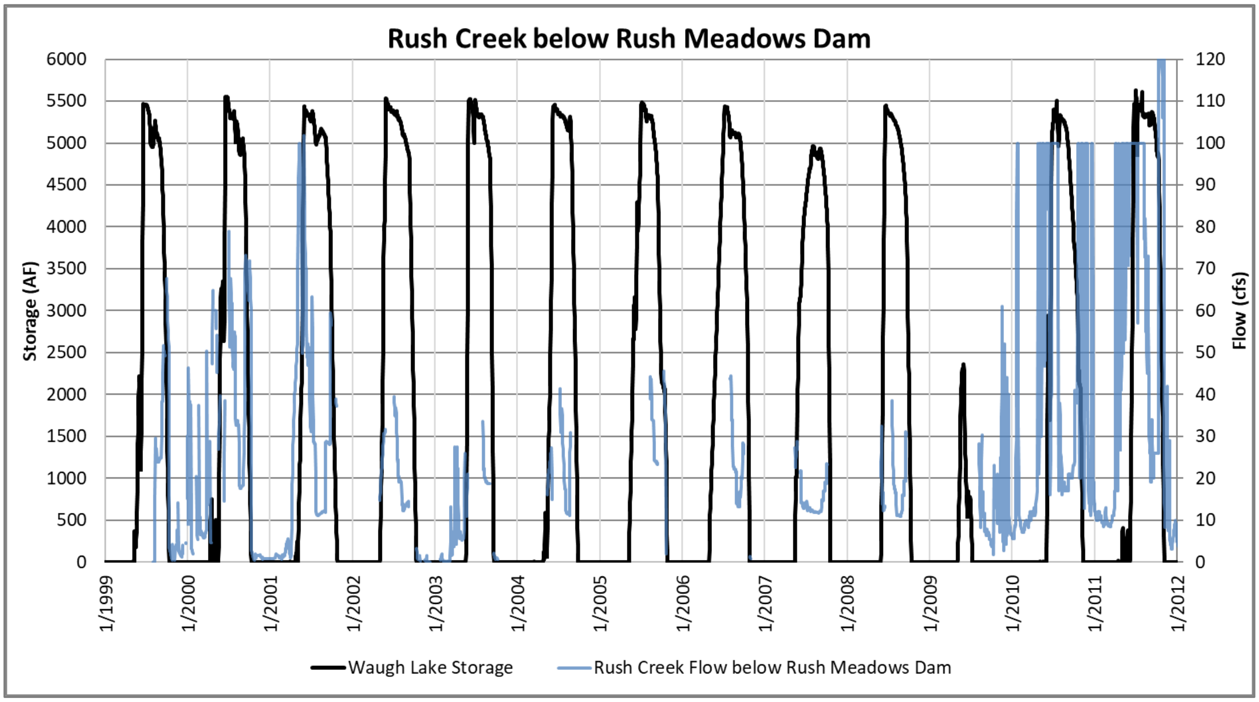



**Figure 8.2-4. Gradient for Project-Affected and Non-Project Affected Stream Reaches/Lakes in the Vicinity of Rush Creek Project**



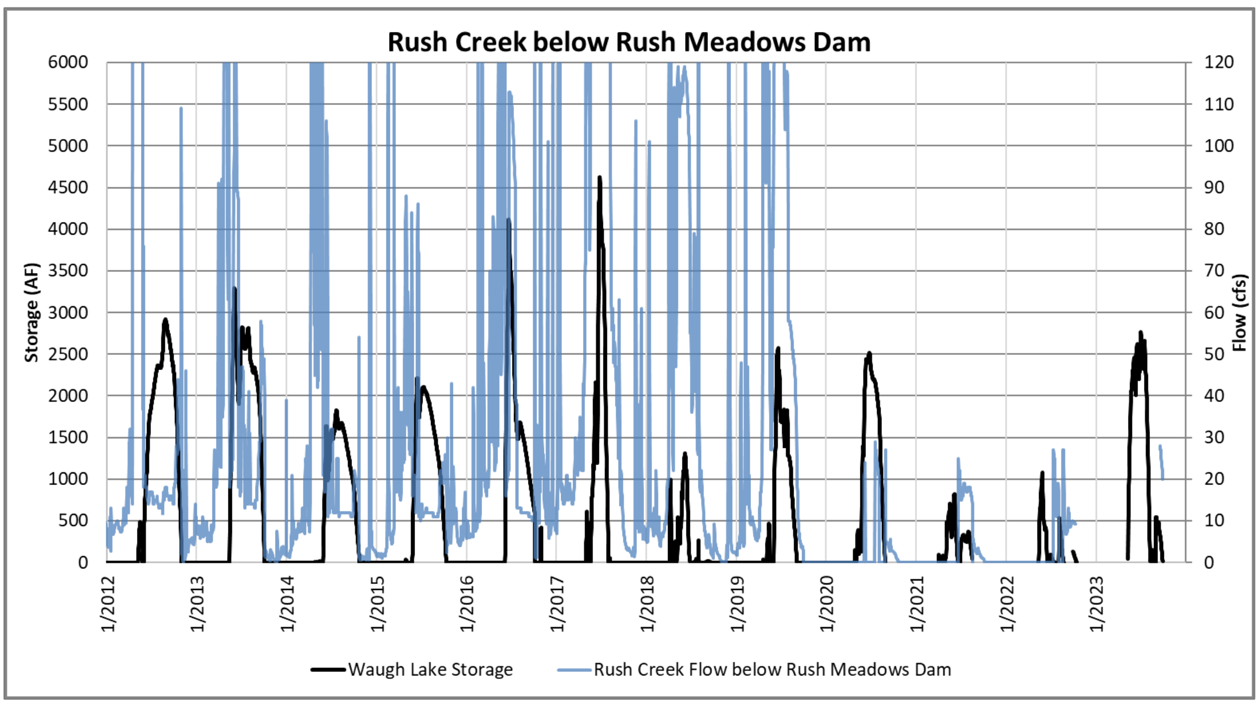
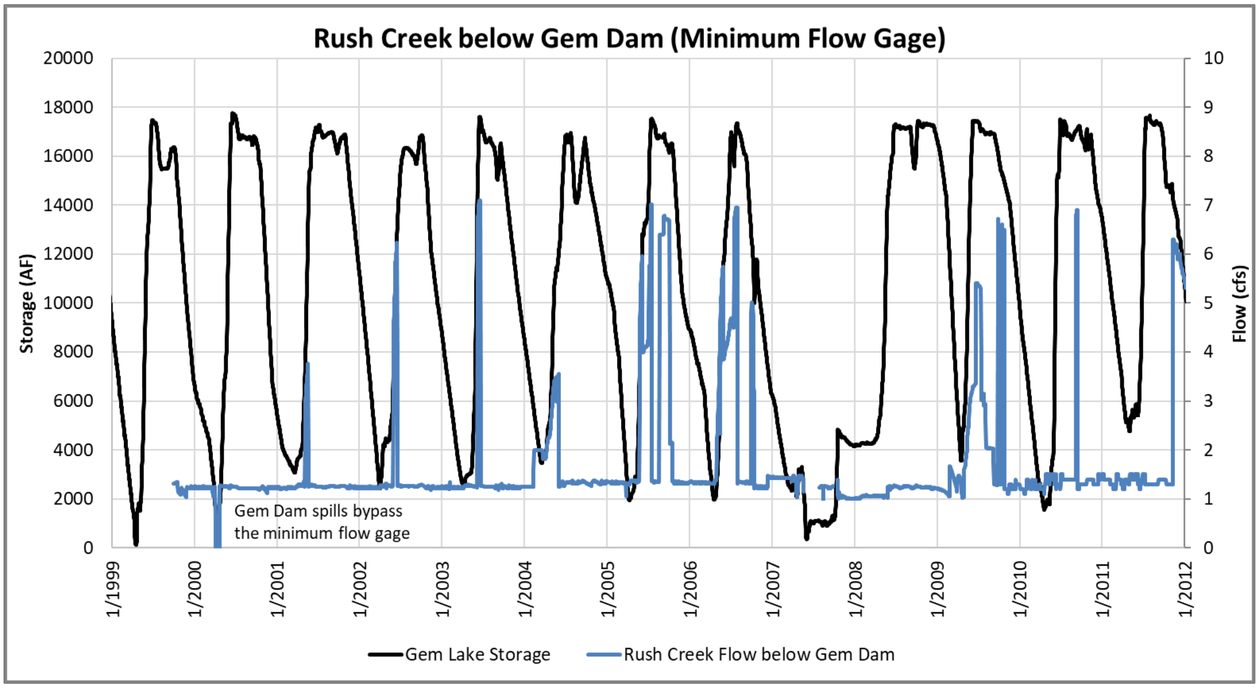
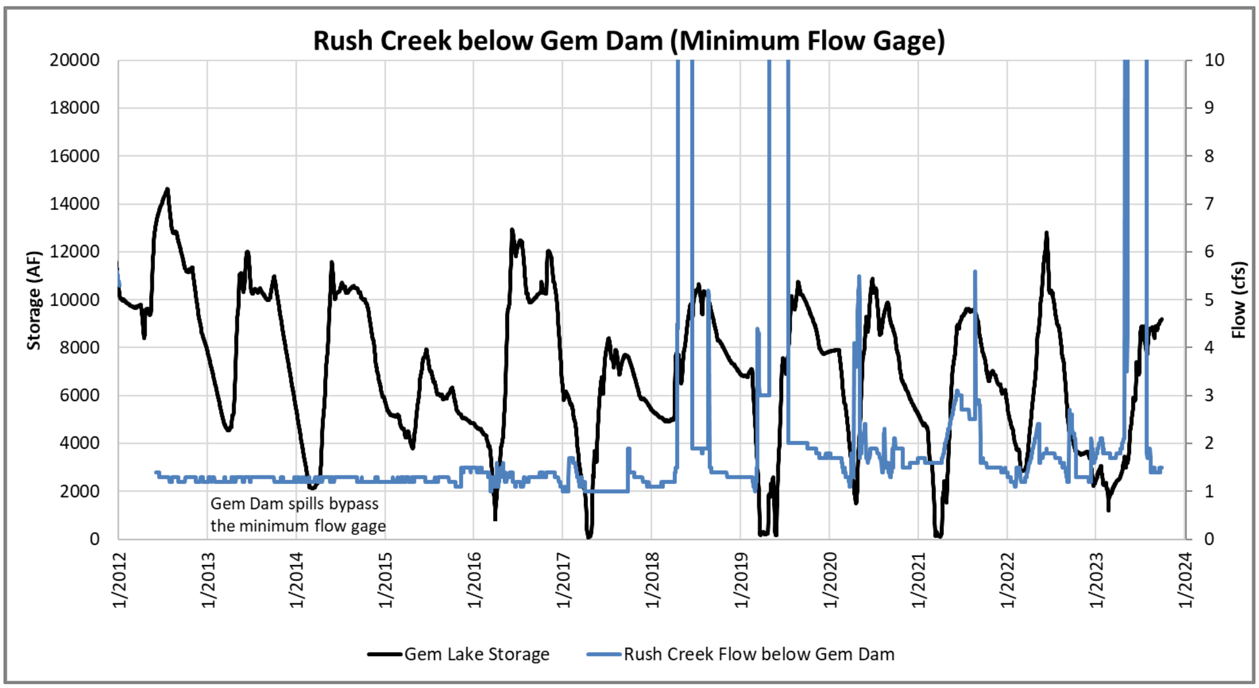



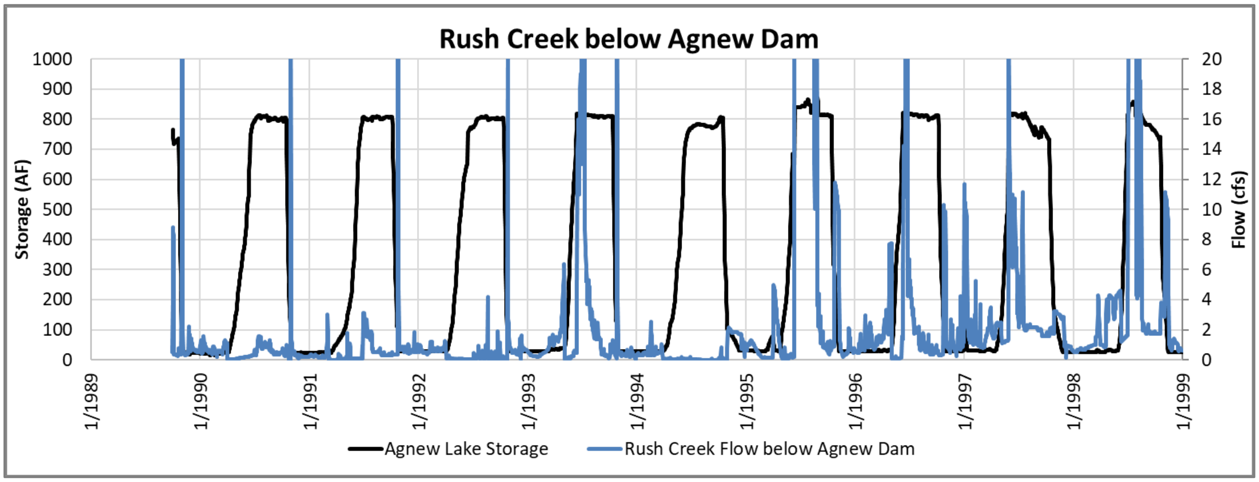

**Figure 8.2-5. Historical Mean Daily Flows (1999–2023 WY) for Rush Creek Below Rush Meadows Dam (SCE 359 R/USGS 10287262)**

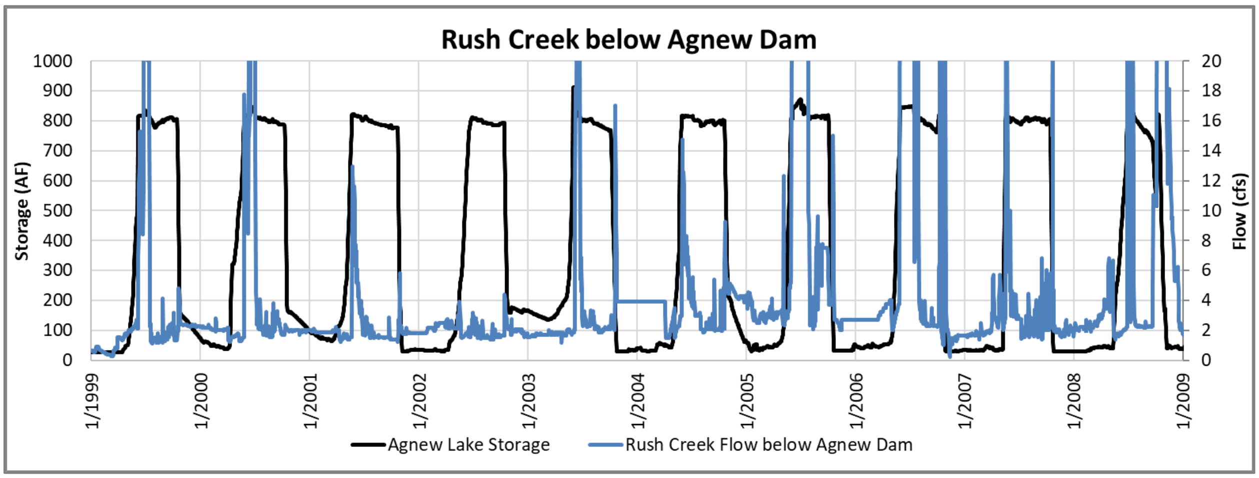



Note: The flow gage only records the minimum flow pipe release and not reservoir spills. In later years bypass flow was recorded from another release pipe.

**Figure 8.2-6. Historical Mean Daily Flows (1999–2023 WY) for Rush Creek Below Gem Dam (SCE 352 R/USGS 10287281)**



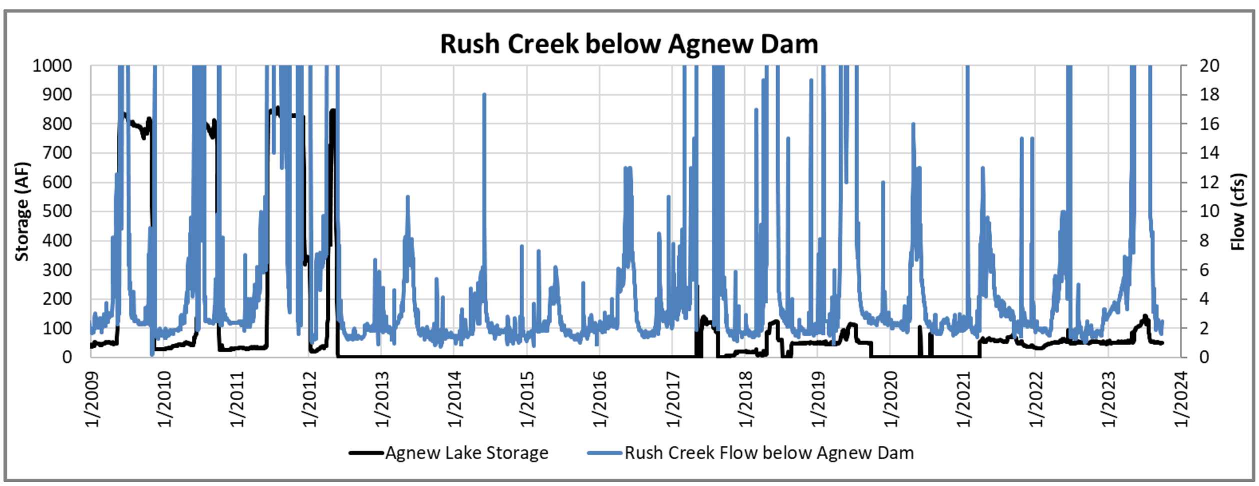
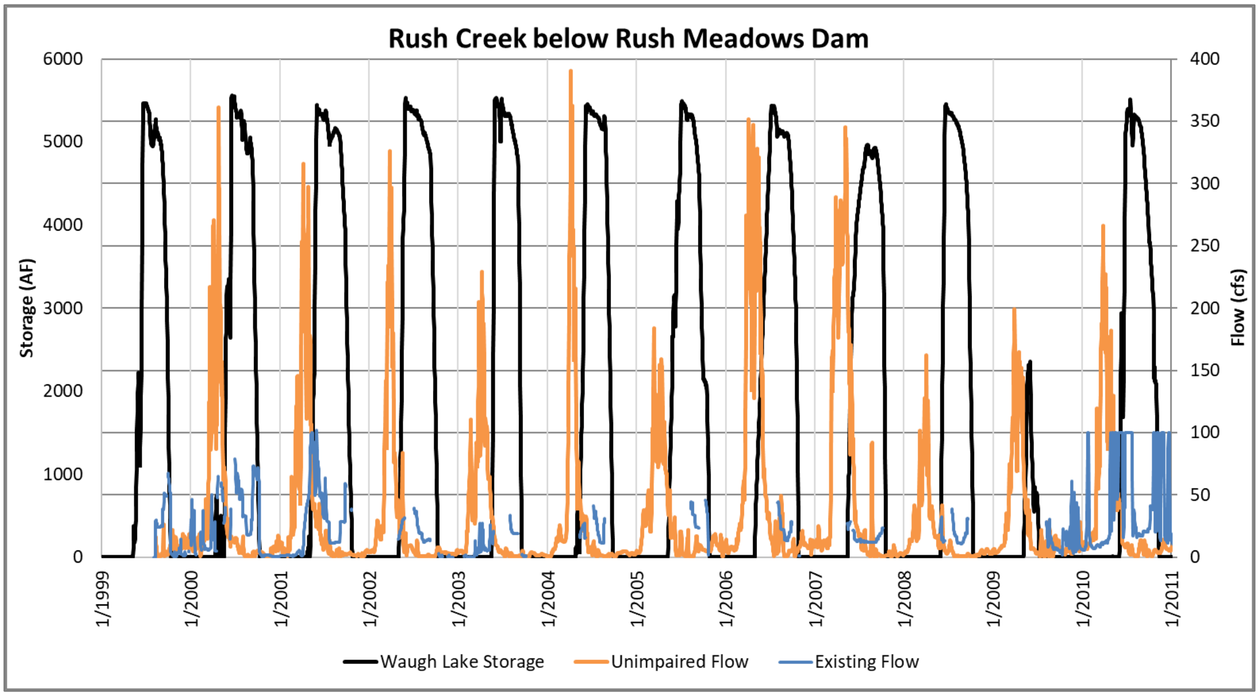




**Figure 8.2-7. Historical Mean Daily Flows (1990–2023 WY) for Rush Creek Below Agnew Dam (SCE 357/USGS 10287289)**



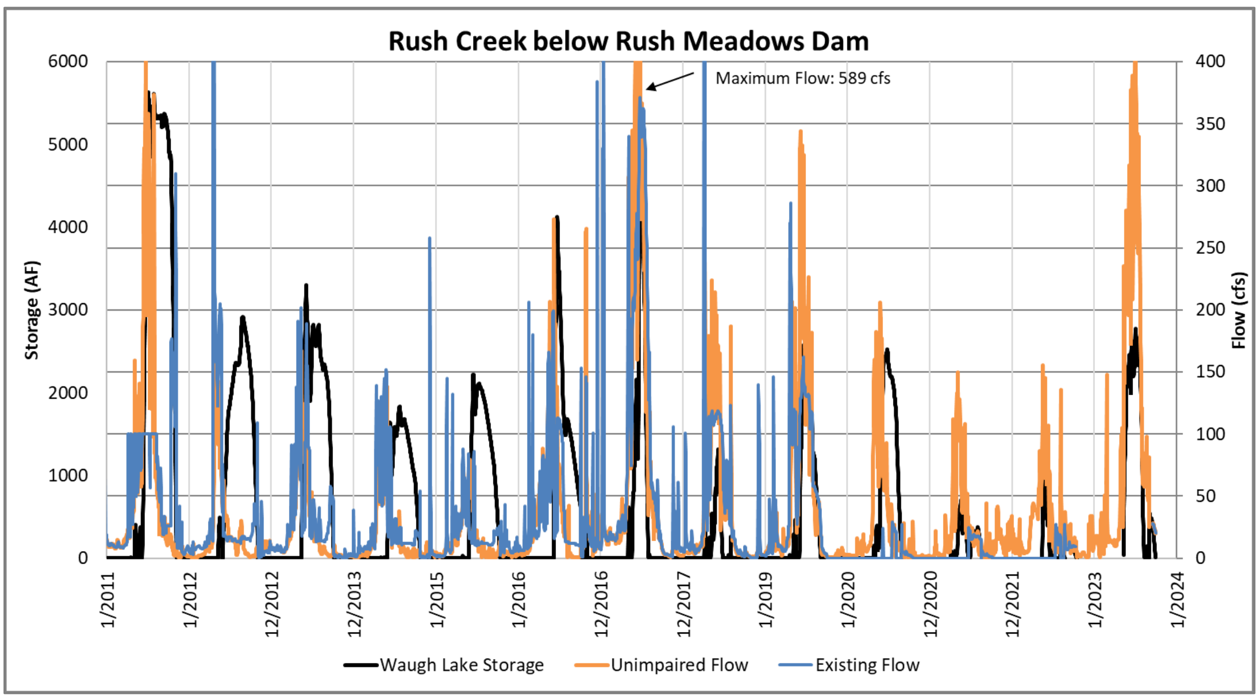
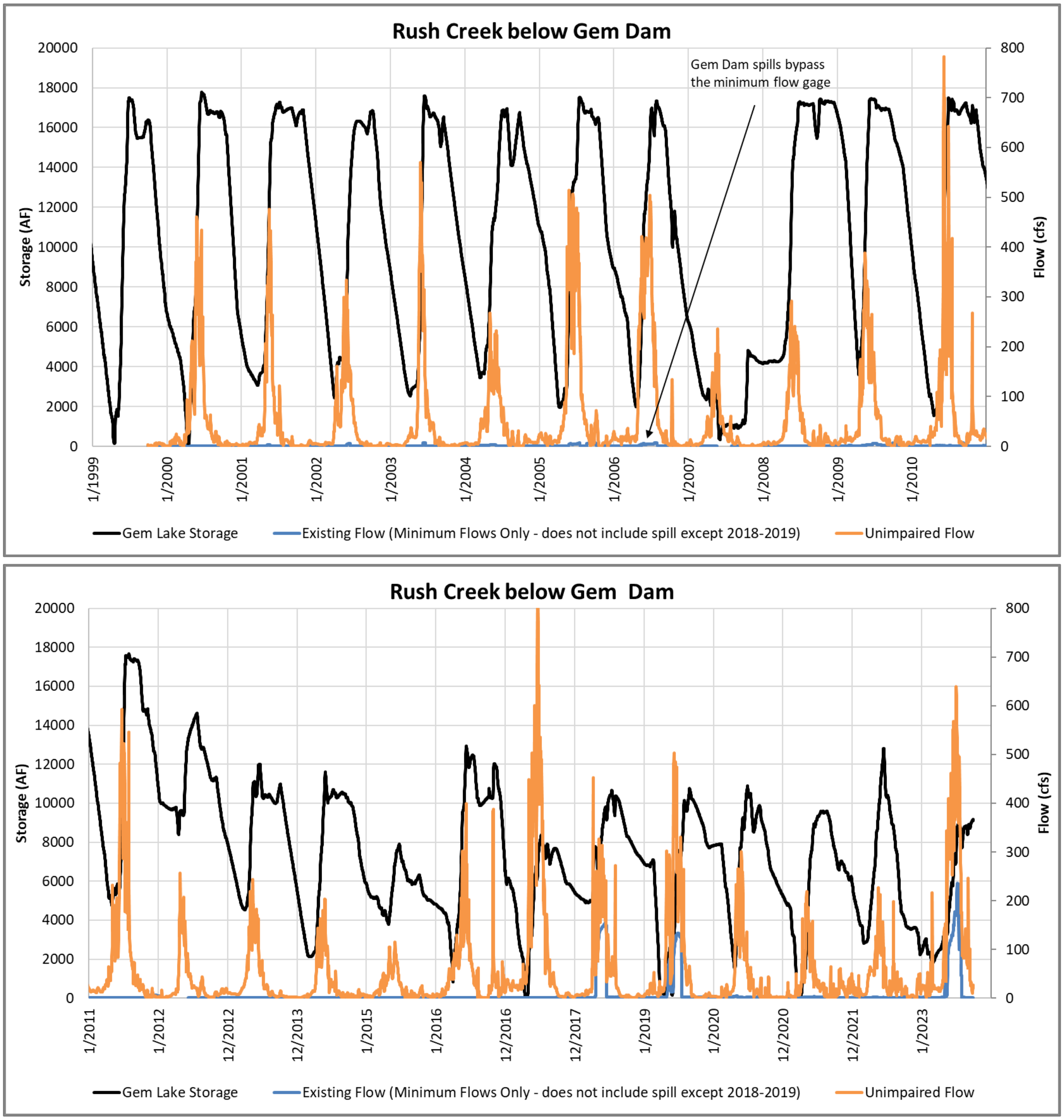




**Figure 8.2-8. Historical Mean Daily Flows (1999–2023 WY) and Unimpaired Flows for Rush Creek Below Rush Meadows Dam (SCE 359 R/USGS 10287262)**




Note: The flow gage only records the minimum flow pipe release and not reservoir spills. In 2018 and 2019 bypass flow was recorded from another release pipe.

**Figure 8.2-9. Historical Mean Daily Flows (1999–2023 WY) and Unimpaired Flows for Rush Creek Below Gem Dam (SCE 352 R/USGS 10287281)**

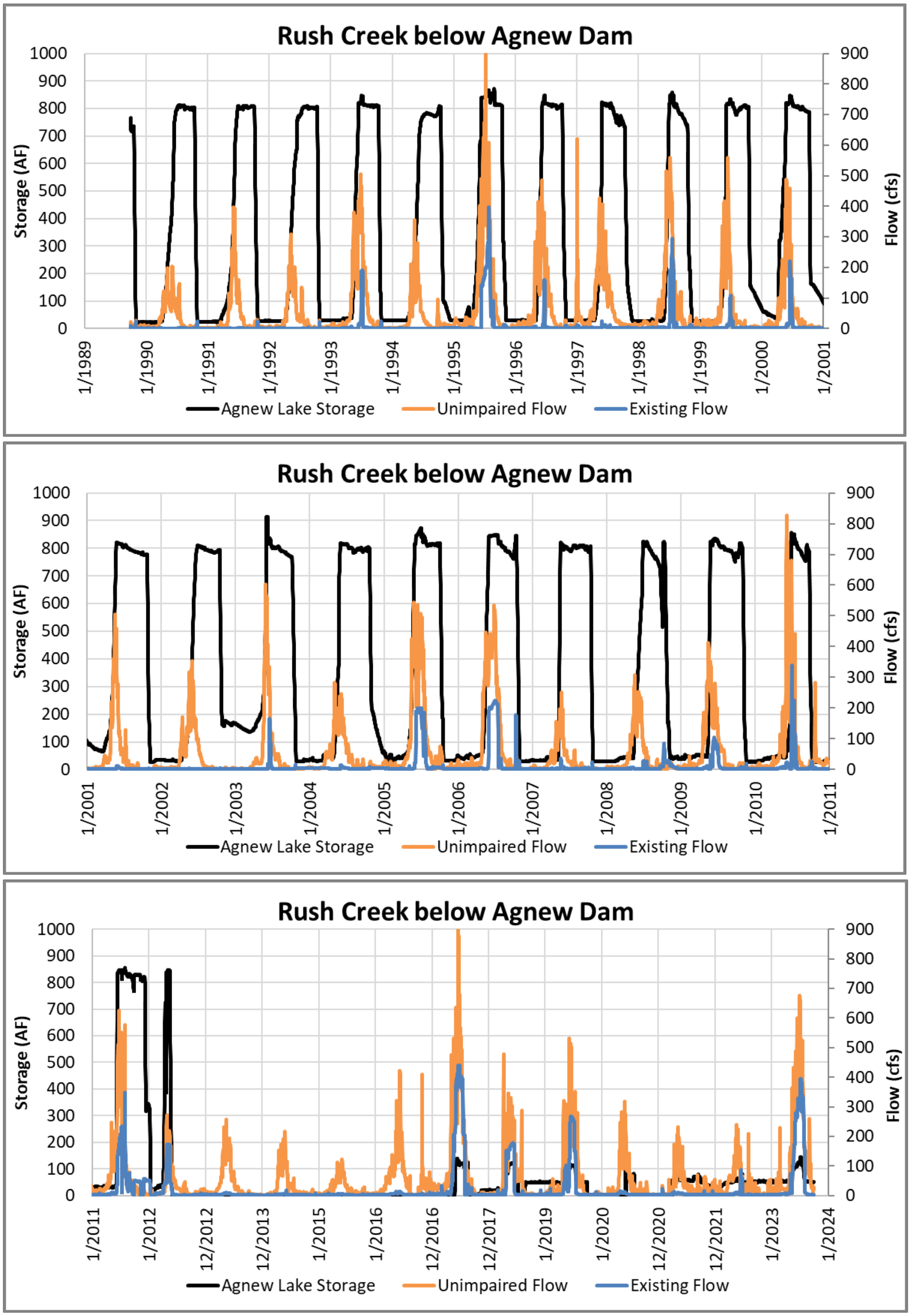



**Figure 8.2-10. Historical Mean Daily Flows (1990–2023 WY) and Unimpaired Flows for Rush Creek Below Agnew Dam (SCE 357/USGS 10287289)**

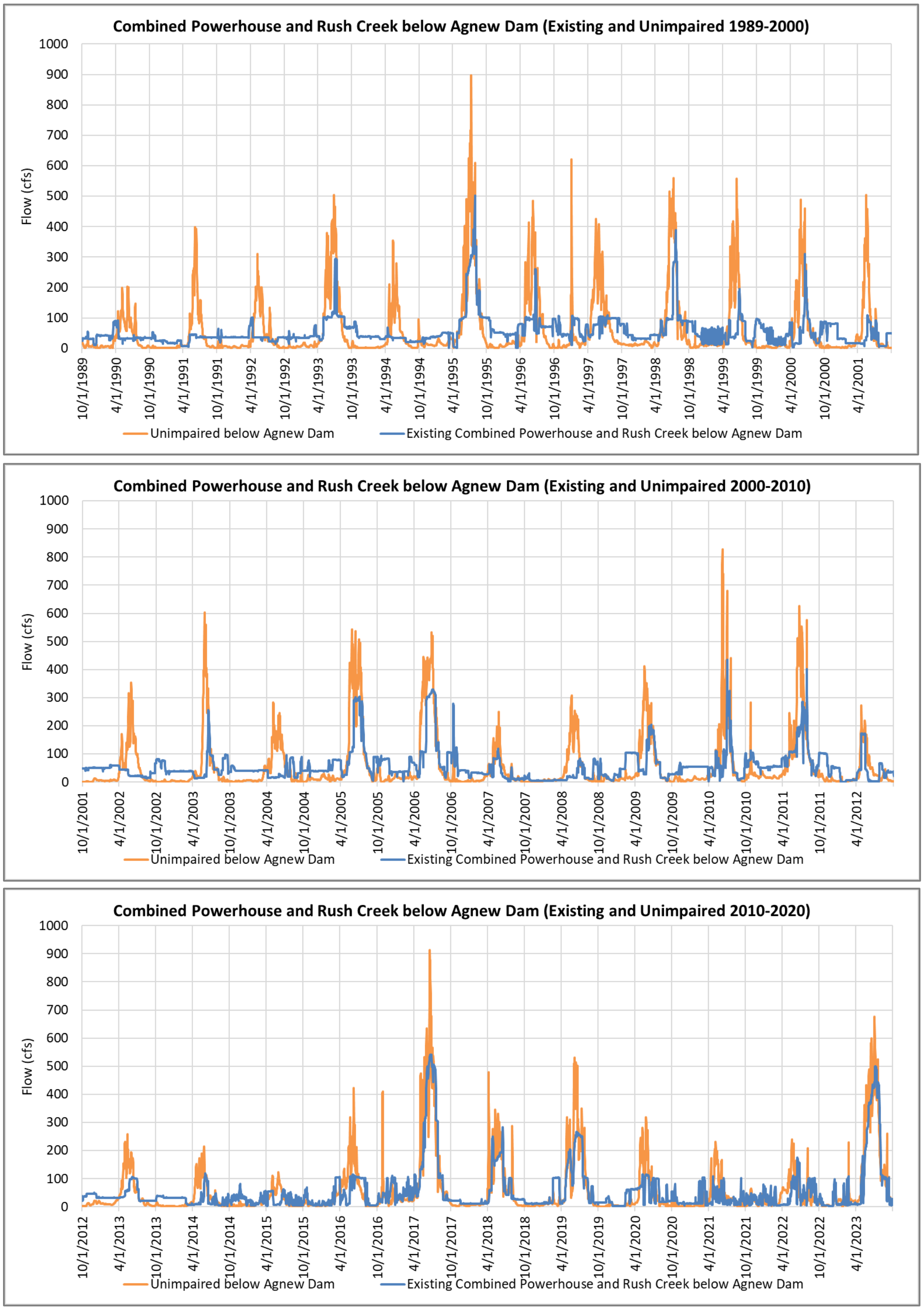



**Figure 8.2-11. Historical Mean Daily Flows (1990–2023 WY) and Unimpaired Flows for the Combined Powerhouse and Rush Creek below Agnew Dam Location (SCE 357/USGS 10287289 and SCE 367/USGS 10287300)**

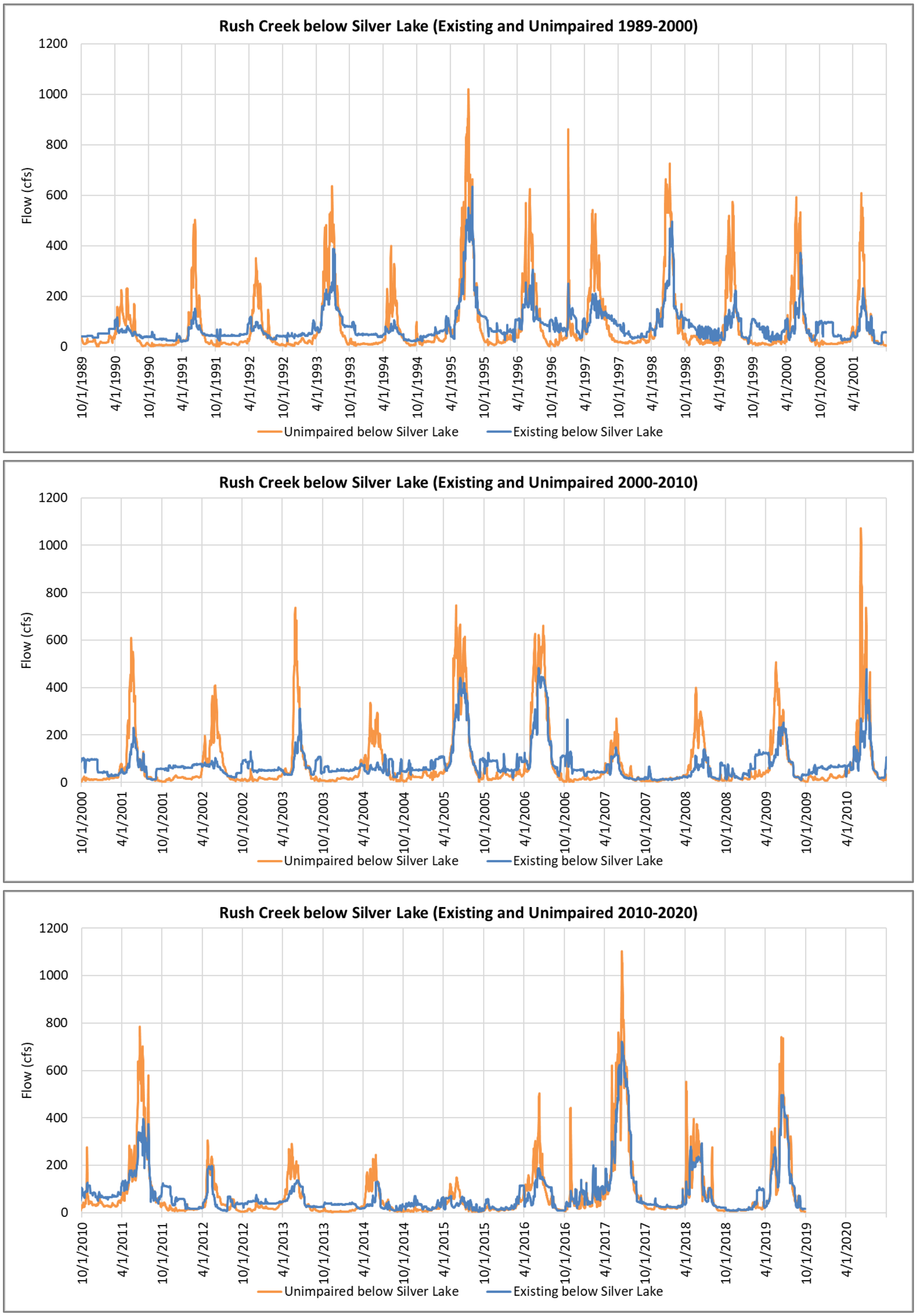



**Figure 8.2-12. Historical Mean Daily Flows (1990–2023 WY) and Unimpaired Flows for Rush Creek Below Silver Lake (LADWP MS 5013/ USGS 10287400)**

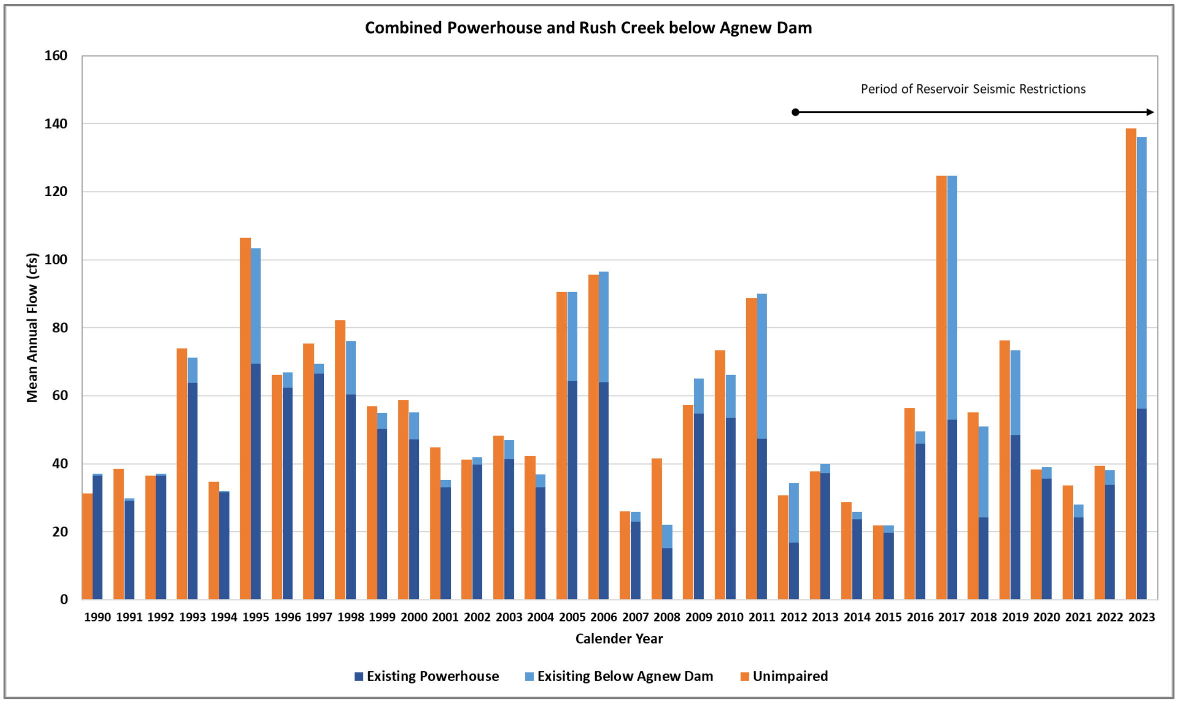



**Figure 8.2-13. Mean Annual Existing and Unimpaired Flow (1990–2023) at the Combined Powerhouse and Rush Creek Powerhouse Gages (SCE 357/USGS 10287289 and SCE 367/USGS 10287300)**

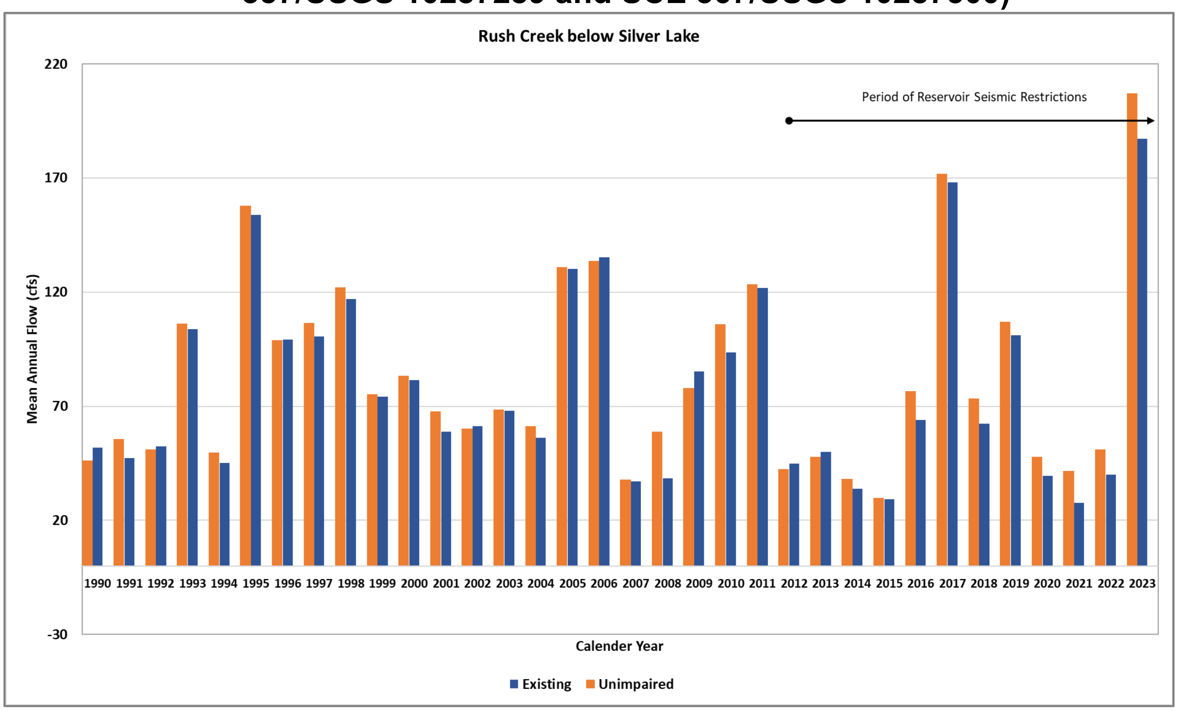
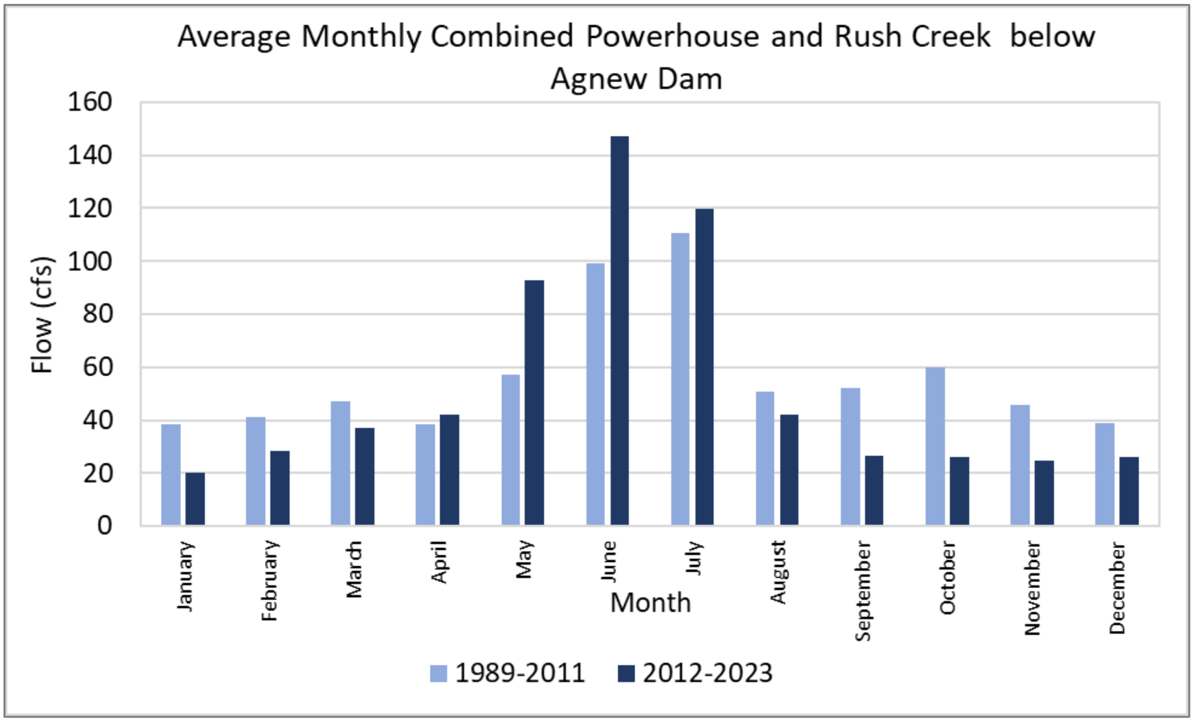



**Figure 8.2-14. Mean Annual Existing and Unimpaired Flow (1990–2023) Below Silver Lake (LADWP MS 5013/USGS 10287400)**



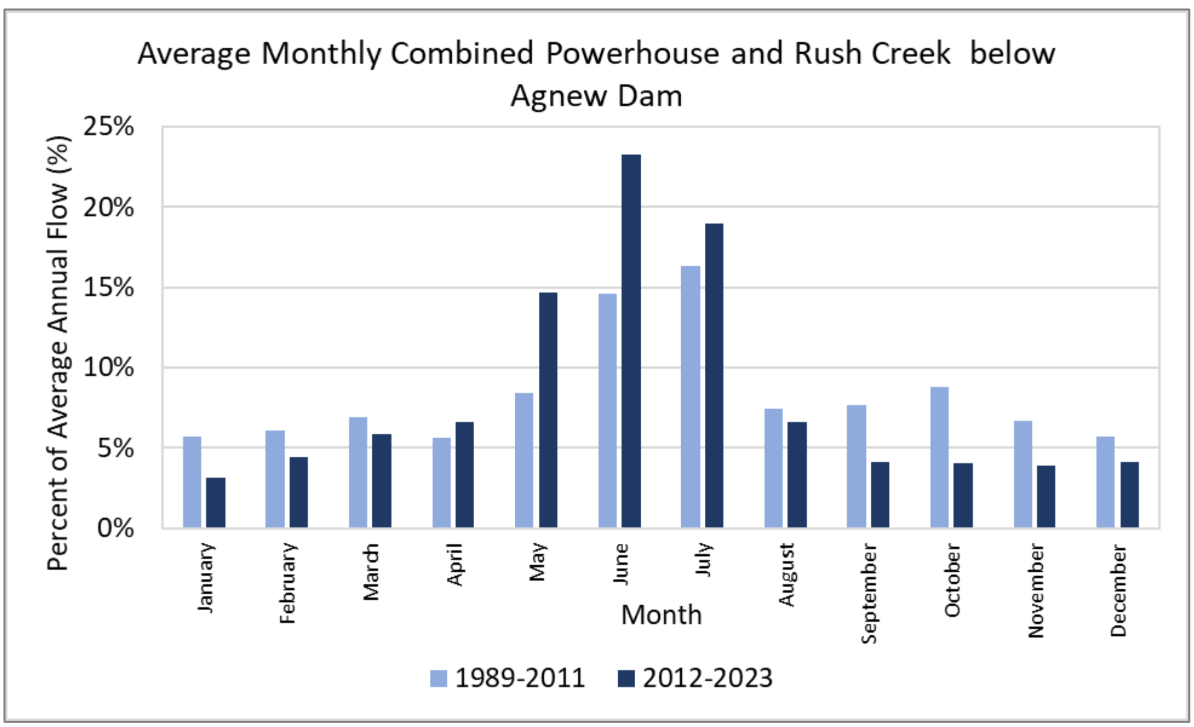
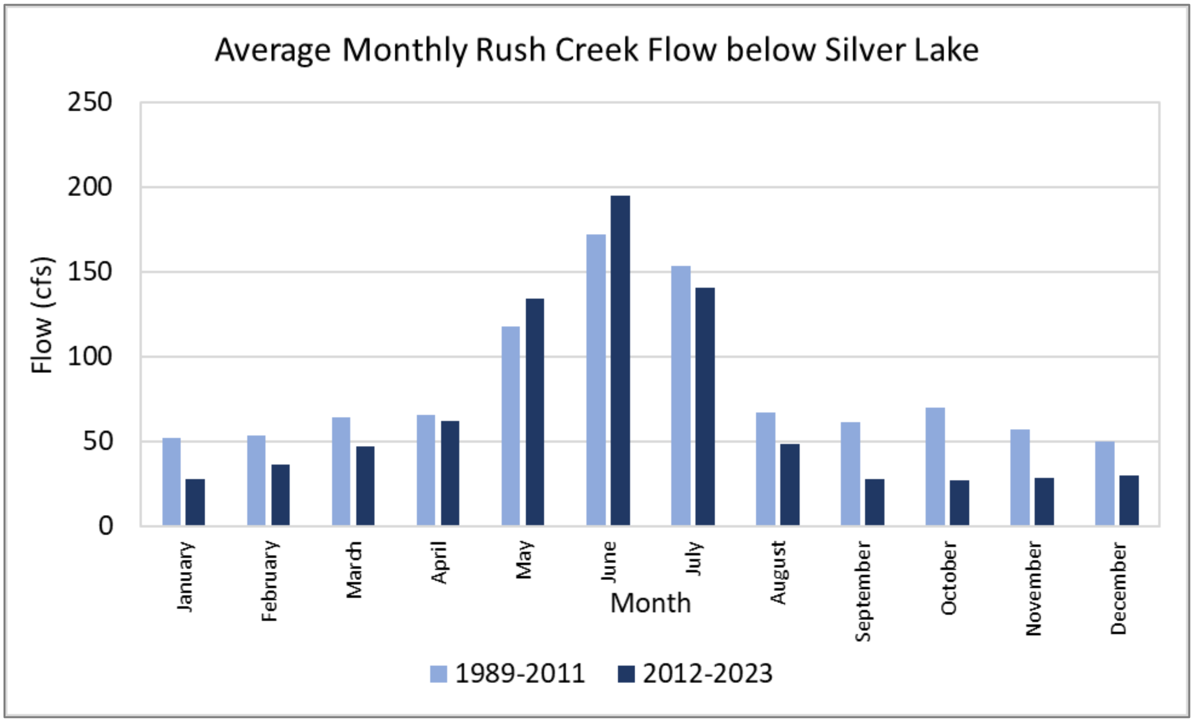




**Figure 8.2-15. Average Monthly Rush Creek Flows for Combined Powerhouse and Rush Creek Below Agnew Dam (SCE 357/USGS 10287289 and SCE 367/USGS 10287300) for the Pre-seismic (1989–2011) and Post-seismic (2012–2023) Restriction Time Periods (Top Graph: Flow in cfs; Bottom Graph: Percentage of Average Annual Flow)**



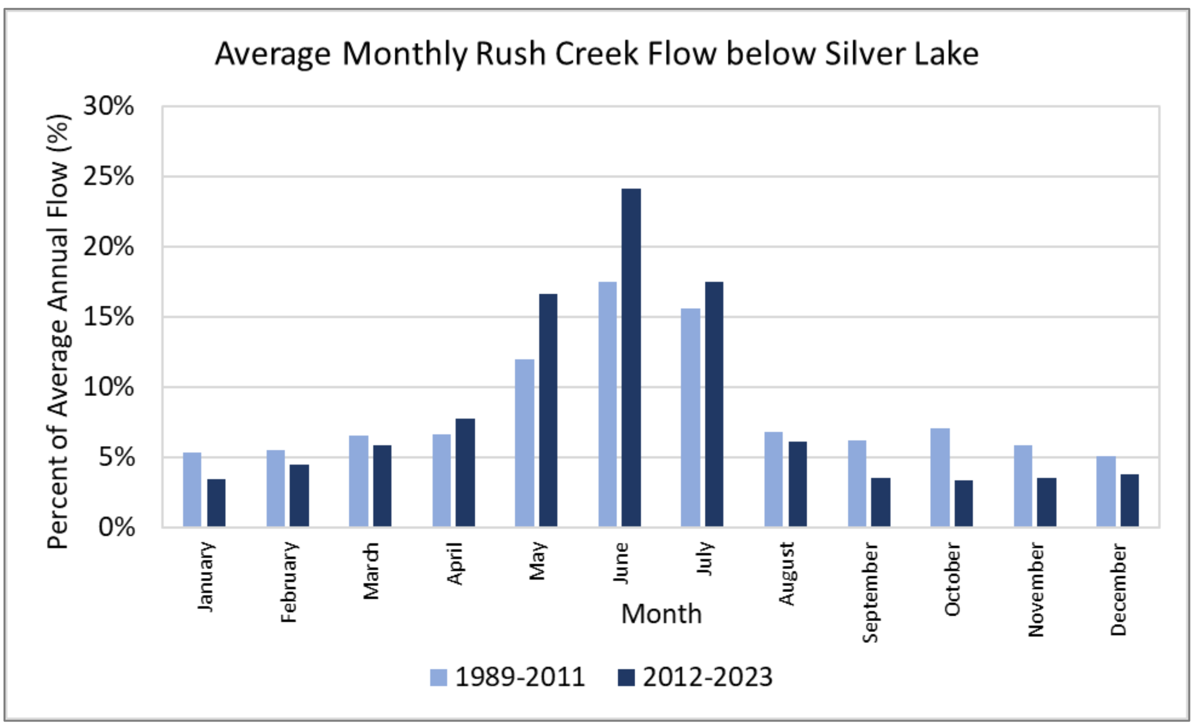




**Figure 8.2-16. Average Monthly Rush Creek Flows for Below Silver Lake (LADWP MS 5013/USGS 10287400) for the Pre-seismic (1989–2011) and Post-seismic (2012–2023) Restriction Time Periods (Top Graph: Flow in cfs; Bottom Graph: Percentage of Average Annual Flow)**

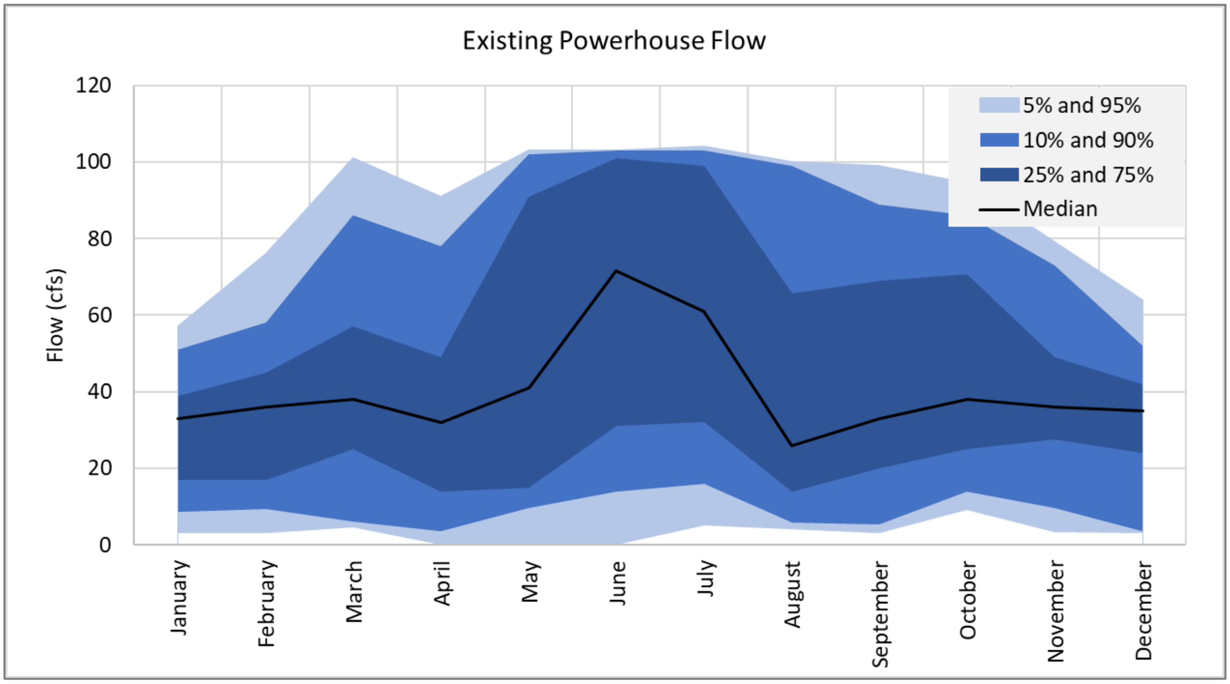



**Figure 8.2-17. Monthly Flow Exceedance Curves for Rush Creek Powerhouse (1989–2023)**

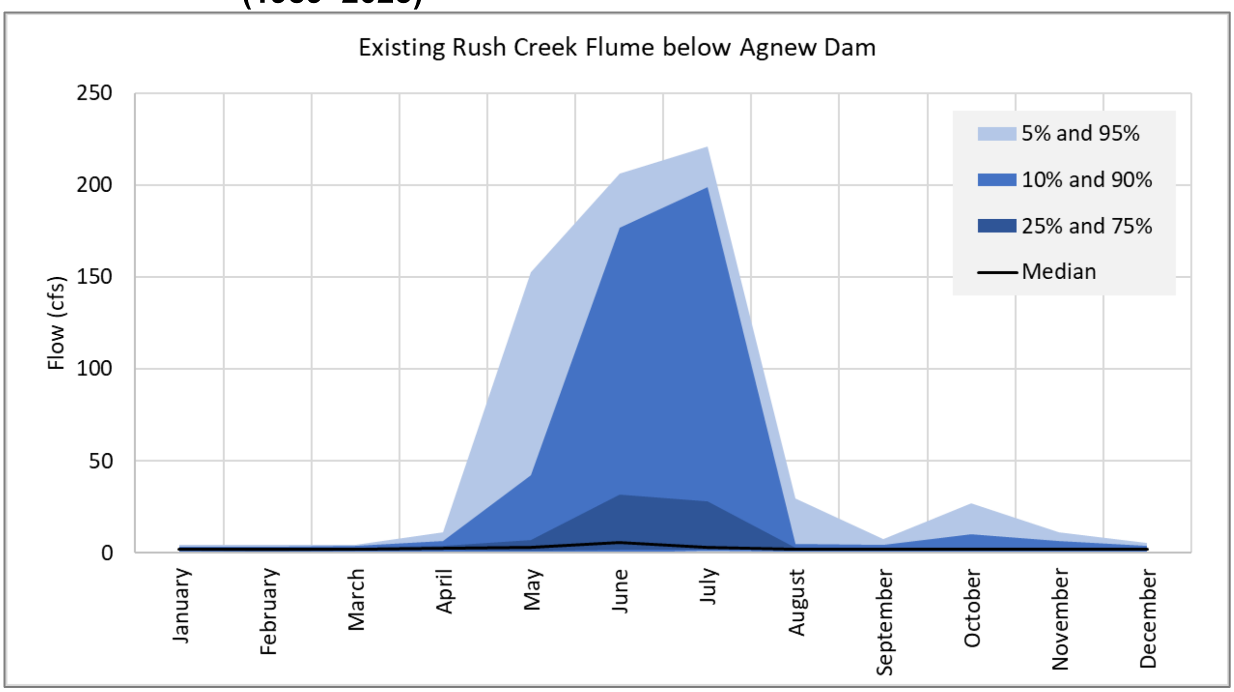
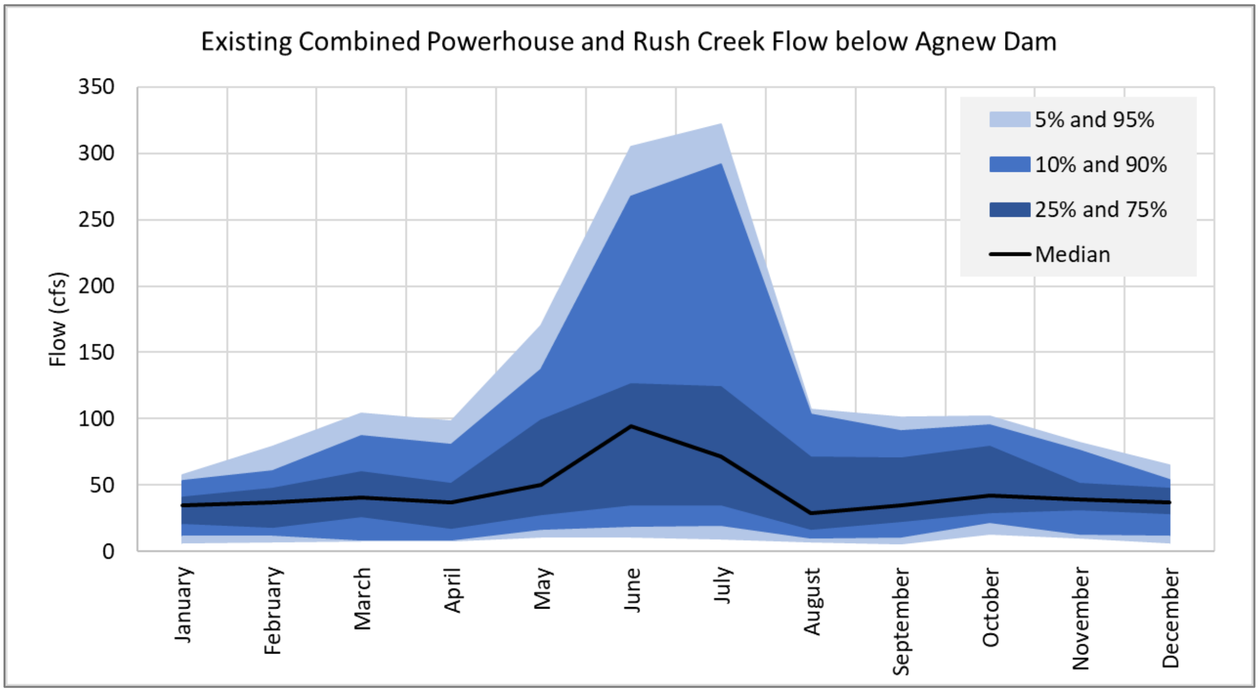



**Figure 8.2-18. Monthly Flow Exceedance Curves for Rush Creek Below Agnew Dam (1989–2023)**



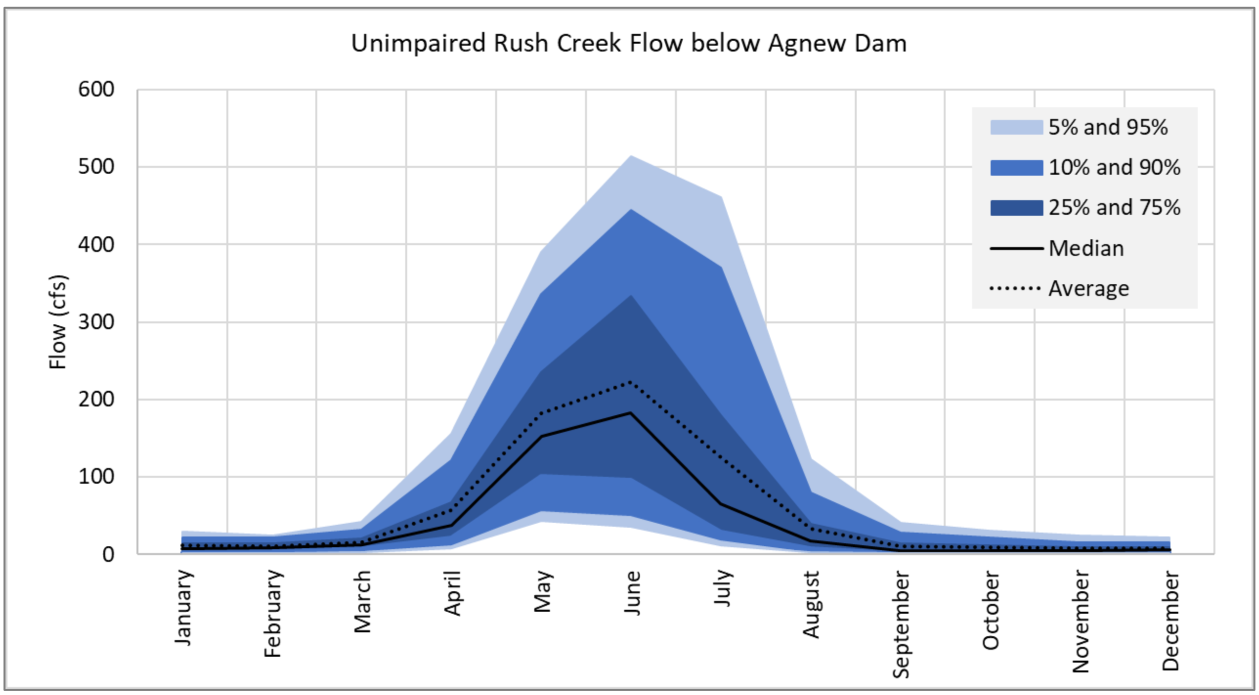
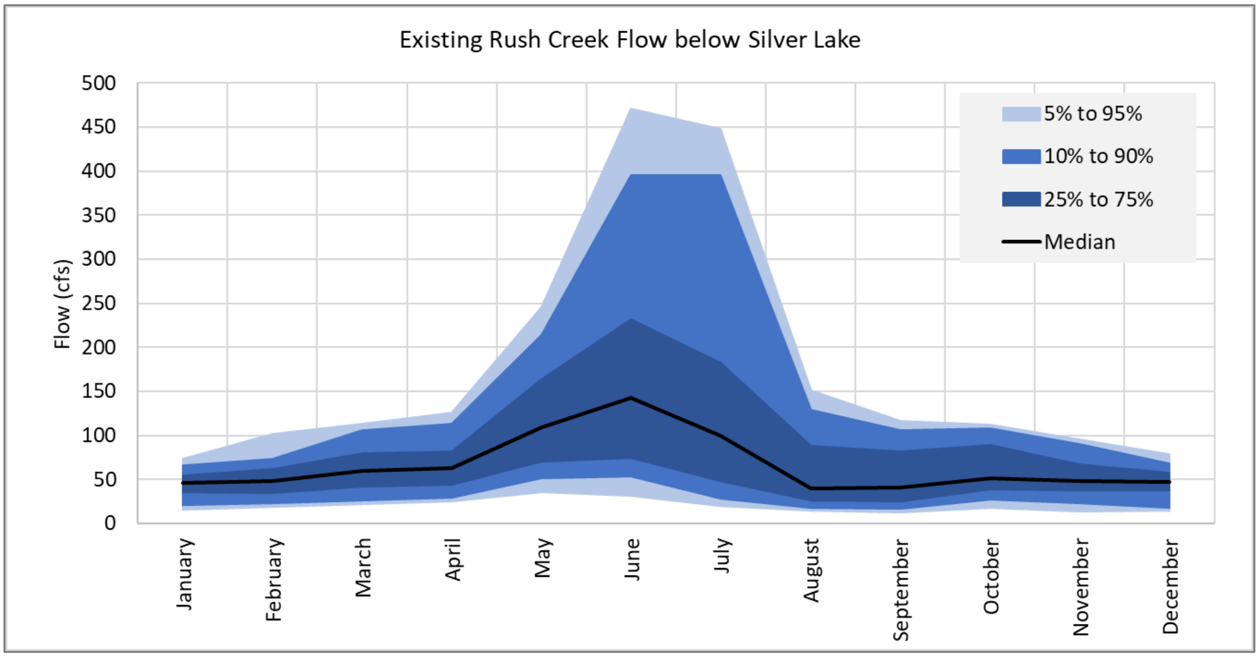




**Figure 8.2-19. Monthly Flow Exceedance Curves for Combined Powerhouse and Rush Creek Below Agnew Dam, Existing and Unimpaired Flows (1989–2023)**



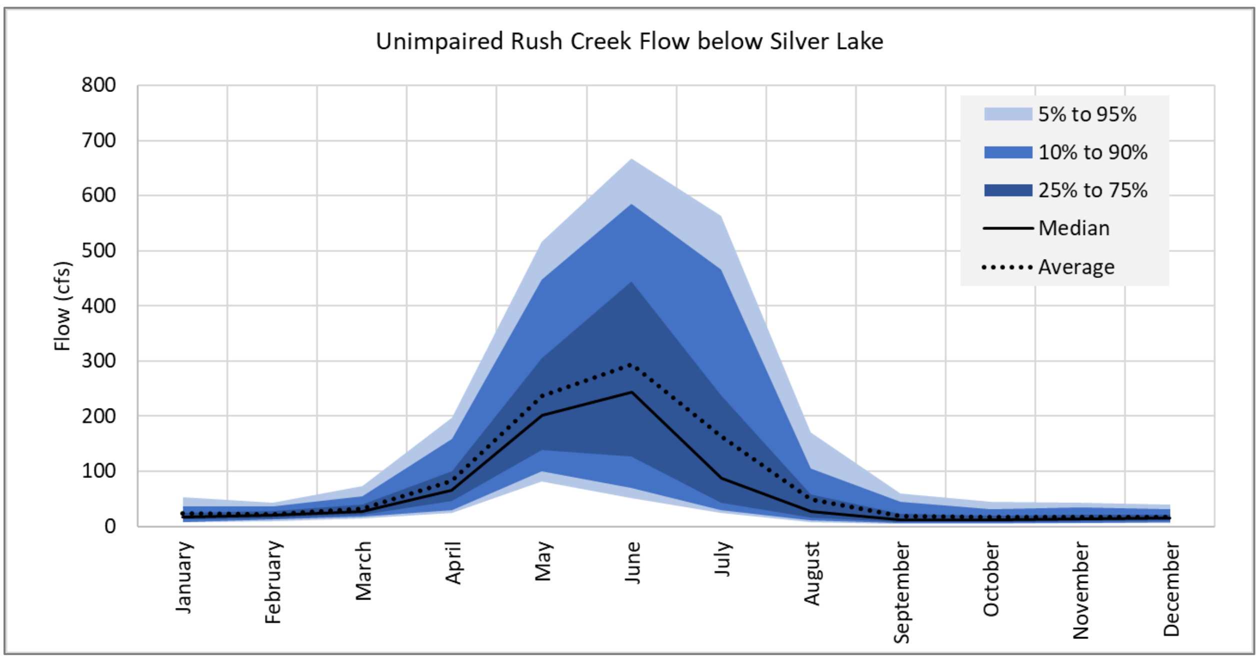




**Figure 8.2-20. Monthly Flow Exceedance Curves for Rush Creek Below Silver Lake, Existing and Unimpaired Flows (1989–2023)**

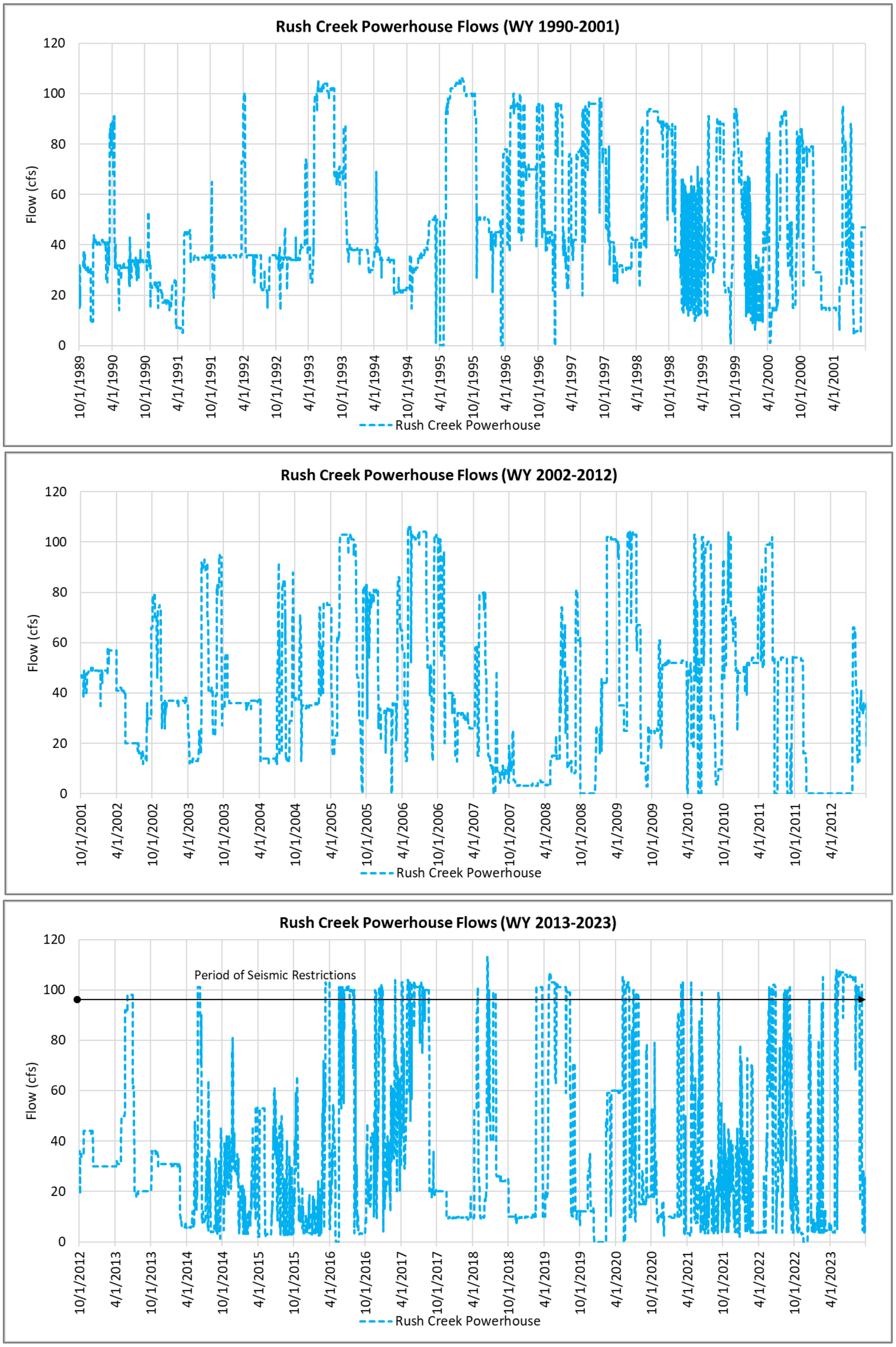
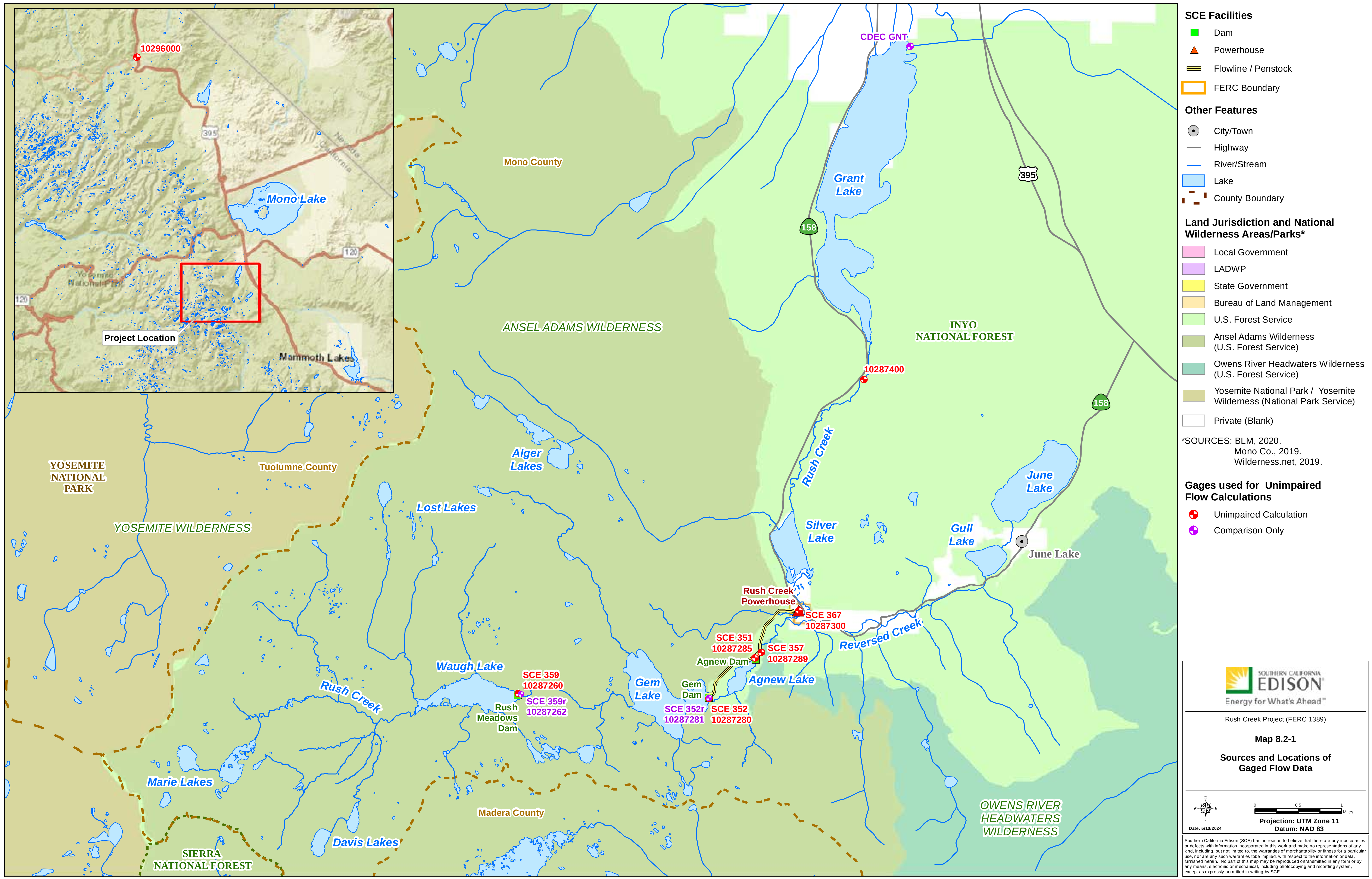



**Figure 8.2-21. Time Series of Rush Creek Powerhouse Flows**

# MAPS



C:\GIS\237800343\map\Rush Creek\HydroMaps\SCE_RUSH_CREEK_Gages_UnimpairedFlow_17i11i_02.mxd

# APPENDIX 8.2-A

## Unimpaired Flow Calculation Methods

## TABLE OF CONTENTS

Page

1.0 Introduction ........ A-1
2.0 Data Sources ........ A-1
3.0 Methodology ........ A-1
3.1 Initial Unimpaired Mass Balance Flow Calculation ........ A-1
3.2 Lag Time Calculation ........ A-2
3.3 Unimpaired Flow Smoothing ........ A-2
3.4 Unimpaired Reference Gage ........ A-2
3.5 Proration using Watershed Area ........ A-3
3.6 Final Unimpaired Flow Calculations ........ A-3
4.0 Results ........ A-4
4.1 Initial Unimpaired Mass Balance Flow Calculation ........ A-4
4.2 Lag Time Calculation ........ A-4
4.3 Unimpaired Flow Smoothing ........ A-4
4.4 Unimpaired Reference Gage ........ A-4
4.5 Final Unimpaired Flow Calculation ........ A-4

## LIST OF TABLES

Table A-1. Flow and Reservoir Gages Used for Unimpaired Rush Creek Flow Calculations ........ A-6

Table A-2. Flow Lag Calculation for Rush Creek Below Silver Lake as a Function of Unimpaired Flow Rate Below Agnew Dam (see Equation 3) ........ A-8

Table A-3. Smoothing Factors by Flow Rate ........ A-8

Table A-4. Walker River Flow Scaler for Rush Creek below Silver Lake by Month ........ A-8

## LIST OF FIGURES

Figure A-1. Rush Creek Project Reservoir Storage (WY 1990–2005) ................A-10

Figure A-2. Rush Creek Measured Stream Flows (WY 1990–2022) ..................A-12

Figure A-3. Monthly Walker River vs. Rush Creek Below Silver Lake Flows ......A-14

Figure A-4. Rush Creek Unimpaired Flow Below Silver Lake (Not Smoothed) and Scaled Walker River Flows (WY 1990–2022)...........................A-15

Figure A-5. Rush Creek Raw vs. Smoothed Calculated Unimpaired Flows Below Agnew Dam (WY 1990–2022) .............................................A-17

Figure A-6. Rush Creek Raw vs. Smoothed Calculated Unimpaired Flows Below Silver Lake (WY 1990–2022)...............................................A-19

Figure A-7. Rush Creek Final Unimpaired Flows Below Agnew Dam and Below Silver Lake (WY 1990–2022)...............................................A-21

Figure A-8. Rush Creek Final Unimpaired Flows at Rush Meadows Dam and Gem Dam (WY 1990–2022)..........................................................A-23

## LIST OF MAPS

Map A-1. Sources and Locations of Gaged Flow Data...................................A-25

## LIST OF ACRONYMS

| | |
|---|---|
| cfs | cubic foot/feet per second |
| WY | water year |

# 1.0 INTRODUCTION

This appendix describes the Rush Creek Project unimpaired hydrology calculation methods and results. Hydrology data were available to calculate unimpaired Rush Creek daily average streamflow for the 1990 through 2022 water years at two locations: 1) Rush Creek below Agnew Dam and 2) Rush Creek below Silver Lake (upstream of Grant Lake). In addition, unimpaired hydrology was prorated via a watershed-based area ratio method to two locations upstream of Agnew Dam—Rush Creek at Rush Meadows Dam and Rush Creek at Gem Dam. Data limitations and missing data required the use of a variety of techniques to develop accurate daily unimpaired flow estimates. The methods used included: 1) mass balance calculations (using stream and reservoir gages); 2) development of flow lag time/travel time relationships; 3) data smoothing; 4) the use of an unimpaired reference gage; and, 5) proration of flow using watershed area. The data sources, methods, and results are described below.

# 2.0 DATA SOURCES

The sources of flow and reservoir storage data used to calculate unimpaired flows for Rush Creek are provided in Table A-1.

# 3.0 METHODOLOGY

## 3.1 INITIAL UNIMPAIRED MASS BALANCE FLOW CALCULATION

The Rush Creek unimpaired streamflow was computed by estimating inflow to the upstream reservoirs (Waugh, Gem and Agnew) from their daily change in storage volume and adding this to the measured flow downstream. This calculation was carried out at two locations: Rush Creek below Agnew Dam and Rush Creek below Silver Lake.

The daily average unimpaired flow calculation for Rush Creek below Agnew Dam is shown below:

$$\begin{aligned} &Rush\ Creek\ Unimpaired\ Daily\ Average\ Flow\ below\ Agnew\ Dam\ (cfs) \\ &\quad = \Delta\, Waugh\ Storage(cfs) + \Delta\, Gem\ Storage(cfs) \\ &\quad + \Delta\, Agnew\ Storage(cfs) \\ &\quad + Rush\ Creek\ Daily\ Average\ Flow\ at\ Flume\ below\ Agnew\ Dam\ (cfs) \\ &\quad + Rush\ Creek\ Daily\ Average\ Power\ Plant\ Tailrace\ Flow\ (cfs) \end{aligned}$$ **(Equation 1)**

The daily average unimpaired flow calculation for Rush Creek below Silver Lake is shown below:

$$\begin{aligned} &Rush\ Creek\ Unimpaired\ Daily\ Average\ Flow\ below\ Silver\ Lake\ (cfs) \\ &\quad = \Delta\, Waugh\ Storage(cfs) + \Delta\, Gem\ Storage(cfs) \\ &\quad + \Delta\, Agnew\ Storage(cfs) \\ &\quad + Rush\ Creek\ Daily\ Average\ Flow\ below\ Silver\ Lake\ (cfs) \end{aligned}$$ **(Equation 2)**

### 3.2 LAG TIME CALCULATION

An analysis of the flow data was used to determine the lag time that should be built into the unimpaired flow calculations for the downstream Rush Creek site below Silver Lake to account for travel time. This was done by comparing the shape of the flow hydrograph at Rush Creek below Silver Lake with the combined hydrograph of the two upstream gages, Rush Creek below Agnew Dam and the Rush Creek Power Plant Tailrace at various flow rates. Current and previous day flow weighting factors were calculated as a function of the Rush Creek below Agnew unimpaired daily average flow rate. These weighting factors range from 0 to 1 (0 to 100%) and add up to 1 (or 100%). The general equation to adjust upstream storage to account for travel time downstream to the Rush Creek below Silver Lake location was as follows:

$$\begin{aligned}&Rush\ Creek\ Unimpaired\ Daily\ Average\ Flow\ below\ Silver\ Lake(cfs)_i\\&= Current\ Day\ Flow\ Weighting\ Factor\ (Flow)_i \times (\Delta\, Waugh\ Storage(cfs)\\&+\ \Delta\, Gem\ Storage(cfs) +\ \Delta\, AgnewStorage(cfs))_i\\&+ Previous\ Day\ Flow\ Weighting\ Factor\ (Flow)_i \times (\Delta\, Waugh\ Storage(cfs)\\&+\ \Delta\, Gem\ Storage(cfs) +\ \Delta\, AgnewStorage(cfs))_{i-1}\\&+ Rush\ Creek\ Daily\ Average\ Flow\ below\ Silver\ Lake\ (cfs)_i\end{aligned}$$

**(Equation 3)**

Where:

Current Day Flow Weighting Factor $(Flow)_i$ = number from 0 to 1, as a function of flow, for day i
Previous Day Flow Weighting Factor $(Flow)_i$ = 1- Current Day Flow Weighting Factor $(Flow)_i$
i=current day, i-1=previous day

### 3.3 UNIMPAIRED FLOW SMOOTHING

Unimpaired flows calculated from daily changes in reservoir volume, especially during low flow periods, are frequently imprecise (noisy) because of small inaccuracies in the daily changes in reservoir volume. At periods of low flow, the calculated unimpaired flows can exhibit unrealistic flow fluctuations from day to day and, potentially, negative flow rates. The calculated raw unimpaired flow was "smoothed" by smoothing/averaging the daily change in storage for each of the reservoirs by a varying number of days based on flow rate. Also, it was observed that the volume-elevation relationships for some of the reservoirs resulted in unrealistically large changes in volume as the reservoirs neared dead-pool. These large changes in volume resulted in large positive/negative flow volumes in the unimpaired calculation that were not realistic. The low elevation portion of the volume-elevation curves were adjusted slightly to better represent changes in volume at low water surface elevations.

### 3.4 UNIMPAIRED REFERENCE GAGE

At the Rush Creek below Silver Lake location, in order to fill data gaps and replace days of calculated negative unimpaired flow rates (due to imprecise daily changes in reservoir storage), it was necessary to identify an unimpaired watershed with good quality gage data for the same period that had a similar hydrograph to Rush Creek. Unimpaired watersheds within the vicinity of Rush Creek were identified and those with data available from 1989 through 2022 where compared to the unimpaired hydrology calculated for Rush Creek below Silver Lake. Particular attention was paid to low flow agreement, since all the periods with calculated negative unimpaired flows occurred during periods of low flow. Once a watershed was selected, a monthly regression was developed to determine an appropriate monthly flow scaling factor. This factor was applied to the daily flow rate of the representative watershed and was used to fill in periods of calculated negative flows.

At the Rush Creek below Agnew Dam location, when calculated negative flow rates required that an alternative dataset be used to estimate unimpaired flow, the average difference in flow between Rush Creek below Agnew Dam and Rush Creek below Silver Lake was calculated from the flow record immediately preceding and following the negative flow period. Then the below Silver Creek flow data for the period in question was adjusted by that average difference to estimate the flow below Agnew Dam. A minimum flow rate of 1 cubic foot per second (cfs) was used in the event that the estimated flow dropped below 1 cfs.

## 3.5 PRORATION USING WATERSHED AREA

Unimpaired hydrology was prorated via a watershed-based area ratio method to two locations upstream of Agnew Dam—Rush Creek at Rush Meadows Dam and Rush Creek at Gem Dam. The unimpaired flow calculated for Rush Creek below Agnew Dam was scaled to the smaller watersheds upstream using the following equations:

$$Rush\ Creek\ Unimpaired\ Daily\ Average\ Flow\ at\ Rush\ Meadows\ Dam\ (cfs) = \frac{15.0}{23.2} * Rush\ Creek\ Daily\ Average\ Unimpaired\ below\ Agnew\ Dam\ (cfs)$$ **(Equation 4)**

$$Rush\ Creek\ Unimpaired\ Daily\ Average\ Flow\ at\ Gem\ Dam\ (cfs) = \frac{21.9}{23.2} * Rush\ Creek\ Daily\ Average\ Unimpaired\ below\ Agnew\ Dam\ (cfs)$$ **(Equation 5)**

Where

15.0, 21.9, and 23.2 equal the watershed area in square miles upstream of Rush Meadows Dam, Gem Dam, and Agnew Dam, respectively.

## 3.6 FINAL UNIMPAIRED FLOW CALCULATIONS

The unimpaired flow calculation for Rush Creek below Agnew Dam and Rush Creek below Silver Lake was calculated using Equations 1 and 2. Once the reservoir storage and subsequently the flow was smoothed, negative flow periods removed and replaced with estimated data, and an appropriate flow travel time lag was added to the downstream Rush Creek below Silver Lake location (Equation 3), the final unimpaired flow for Rush Creek below Agnew Dam and Rush Creek below Silver Lake was calculated. Equations 4 and 5 were then used to calculate unimpaired flow for Rush Creek at Rush Meadows Dam and at Gem Dam.

# 4.0 RESULTS

## 4.1 Initial Unimpaired Mass Balance Flow Calculation

Reservoir storage data for Waugh, Gem and Agnew for water years 1990 through 2022 are plotted in Figure A-1. Rush Creek measured stream flows for water years 1990 through 2022 are plotted in Figure A-2.

## 4.2 Lag Time Calculation

The multiplier (flow weighting factor) used to calculate the flow adjustment to account for travel time to the Rush Creek site below Silver Lake are provided in Table A-2

## 4.3 Unimpaired Flow Smoothing

The number of days reservoir storage (change in storage) was averaged for smoothing the calculated raw unimpaired flow is provided in Table A-3 as a function of flow rate.

## 4.4 Unimpaired Reference Gage

After comparing hydrology from several local unimpaired watersheds, it was determined that the best agreement between calculated unimpaired flow on Rush Creek and a reference gage was Walker River near Coleville California (USGS 10296000), particularly at low flows. A regression for each month of the year was developed to determine an appropriate monthly flow scaling factor. The monthly flow comparisons can be seen in Figure A-3. A plot of the raw unimpaired Rush Creek flow below Silver Lake and the scaled Walker River Flow for water years 1990 through 2022 is shown in Figure A-4, along with an indication of when scaled Walker River flows were used (Table A-4). When scaled Walker River flows were used to estimate Rush Creek flow below Silver Lake, it was often also necessary to fill gaps in Rush Creek flow below Agnew Dam. This was done by subtracting estimated accretion flows from the final smoothed unimpaired flow calculated at Rush Creek below Silver Lake.

## 4.5 Final Unimpaired Flow Calculation

Figure A-5 compares the initial raw unimpaired flow calculation to the final smoothed unimpaired flow calculation for Rush Creek below Agnew Dam. Figure A-6 compares the initial raw unimpaired flow calculation to the final smoothed unimpaired flow calculation for Rush Creek below Silver Lake.

Figure A-7 provides the final unimpaired Rush Creek flows below Agnew Dam and below Silver Lake for water years 1990 through 2022.

Figure A-8 shows the watershed area prorated flows for Rush Creek at Rush Meadows Dam and Gem Dam.

# TABLES

## Table A-1. Flow and Reservoir Gages Used for Unimpaired Rush Creek Flow Calculations

| Location | Entity and Station No. | Data Type | Period of Record | Notes | Data Use | Location (NAD27) | Drainage Area (Square Miles) | Elevation (Feet above NGVD29) |
|---|---|---|---|---|---|---|---|---|
| **Waugh Lake** | | | | | | | | |
| Waugh Lk near June Lake CA | SCE 359 and USGS 10287260 | Daily Storage | 10/01/1989–Present | Full Record Available | Unimpaired Calculation | Latitude 37°45'04", Longitude 119°10'52" | 15.3 | 9,370 |
| **Rush Creek below Rush Meadows Dam (Rush Creek below Waugh Lake)** | | | | | | | | |
| Rush C controlled release below Waugh Lk near June Lake CA | SCE 359 R and USGS 10287262 | Daily Flow | 08/11/1999–Present | Spotty data – no flows recorded above 30 cfs | Comparison Only | Latitude 37°45'04", Longitude 119°10'50" | 15.3 | 9,375 |
| **Gem Lake** | | | | | | | | |
| Gem Lake | SCE 352 and USGS 10287280/ CDEC GLK | Daily Storage | 10/01/1989–Present | Full Record Available | Unimpaired Calculation | Latitude 37°45'07", Longitude 119°08'25" | 22 | 8,970 |
| **Rush Creek below Gem Dam (Rush Creek below Gem Lake)** | | | | | | | | |
| Rush C controlled release below Gem Lake near June Lake, CA | SCE 352 R and USGS 10287281 | Daily Flow | 10/19/1999–Present | Full Record Available | Comparison Only | Latitude 37°45'05", Longitude 119°08'26" | 22 | 9,000 |
| **Agnew Lake** | | | | | | | | |
| Agnew Lk near June Lake CA | SCE 351 and USGS 10287285 | Daily Storage | 10/01/1989–Present | Full Record Available | Unimpaired Calculation | Latitude 37°45'30", Longitude 119°07'52" | 23.3 | 8,470 |
| **Rush Creek below Agnew Dam (Rush Creek at Flume below Agnew)** | | | | | | | | |
| Rush Creek at Flume below Agnew Lake near June Lake CA | SCE 357 and USGS 10287289 | Daily Flow | 10/01/1988–Present | Full Record Available | Unimpaired Calculation | Latitude 37°45'33", Longitude 119°07'47" | NA | 8,440 |

| Location | Entity and Station No. | Data Type | Period of Record | Notes | Data Use | Location (NAD27) | Drainage Area (Square Miles) | Elevation (Feet above NGVD29) |
|---|---|---|---|---|---|---|---|---|
| **Rush Creek PP Tailrace** | | | | | | | | |
| Rush Creek PP tailrace near June Lake CA | SCE 367 and USGS 10287300 | Daily Flow | 10/01/1986–Present | Full Record Available | Unimpaired Calculation | Latitude 37°45'59", Longitude 119°07'17" | NA | 7,230 |
| **Rush Creek below Silver Lake (Rush Creek above Grant Lake)** | | | | | | | | |
| Rush Creek ab Grant Lake near June Lake CA | LADWP MS 5013 and USGS 10287400 | Daily Flow | 10/01/1986–Present | Pre-1990 Monthly Only | Unimpaired Calculation | Latitude 37°48'23", Longitude 119°06'29" | 51.3 | 7,200 |
| **Grant Lake** | | | | | | | | |
| Grant Lake | CDEC GNT | Monthly Storage | 01/01/1956–Present | Only monthly data available on CDEC | Comparison Only | Latitude 37°51'43.2", Longitude 119°6'7.2" | | 7,140 |
| **Walker River** | | | | | | | | |
| Walker River | USGS 10296000 | Daily Flow | 04/01/1938–Present | Full Record Available | Comparison and Gap Filling | Latitude 38°22'47", Longitude 119°26'57" | 181 | 6,591 |

Key: CDEC GNT = California Data Exchange Center Grant Lake Station (GNT)
LADWP MS 5013 = Los Angeles Department of Water and Power Measuring Station 5013
NAD27 = North American Datum of 1927
NGVD29 = National Geodetic Vertical Datum of 1929
PP = Powerplant
SCE = Southern California Edison Company
USGS = U.S. Geological Survey

## Table A-2. Flow Lag Calculation for Rush Creek Below Silver Lake as a Function of Unimpaired Flow Rate Below Agnew Dam (see Equation 3)

| Unimpaired Flow Below Agnew – No Smoothing (cfs) | Current Day Flow Weighting Factor |
|---|---|
| 0 | 0.0 |
| 40 | 0.2 |
| 55 | 0.4 |
| 70 | 0.5 |
| 200 | 0.5 |
| 300 | 0.6 |
| >400 | 1.0 |

## Table A-3. Smoothing Factors by Flow Rate

| Daily Change in Storage (cfs) | Smoothing Interval (Days) |
|---|---|
| 0-20 | 11 |
| >20-100 | 7 |
| >100-150 | 3 |
| >150 | 1 |

## Table A-4. Walker River Flow Scaler for Rush Creek below Silver Lake by Month

| Month | Walker River Scaler for Rush Creek above Grant Lake |
|---|---|
| January | 0.23 |
| February | 0.28 |
| March | 0.20 |
| April | 0.22 |
| May | 0.25 |
| June | 0.28 |
| July | 0.31 |
| August | 0.34 |
| September | 0.31 |
| October | 0.27 |
| November | 0.30 |
| December | 0.27 |
| *Average* | *0.27* |

# FIGURES

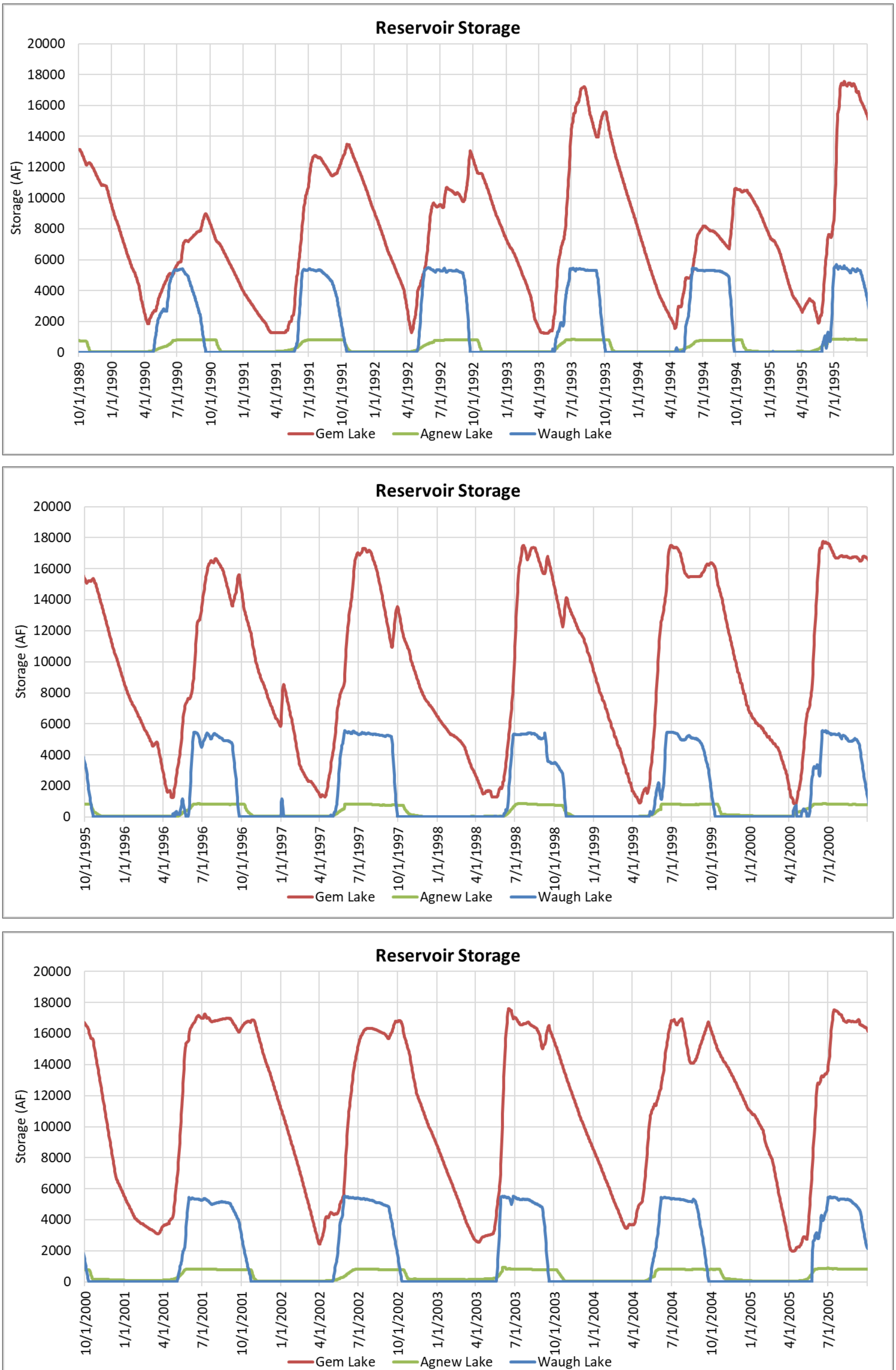
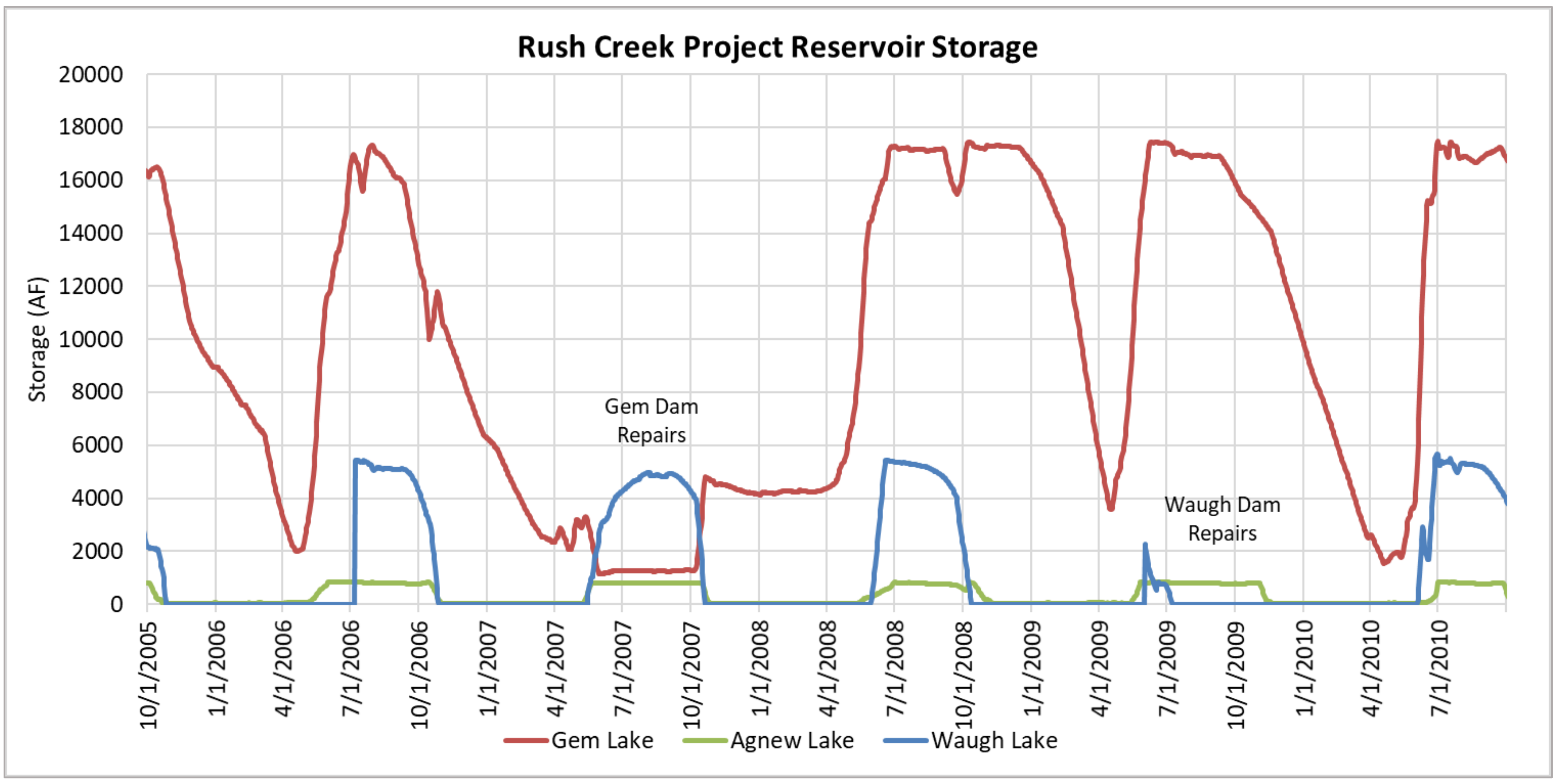
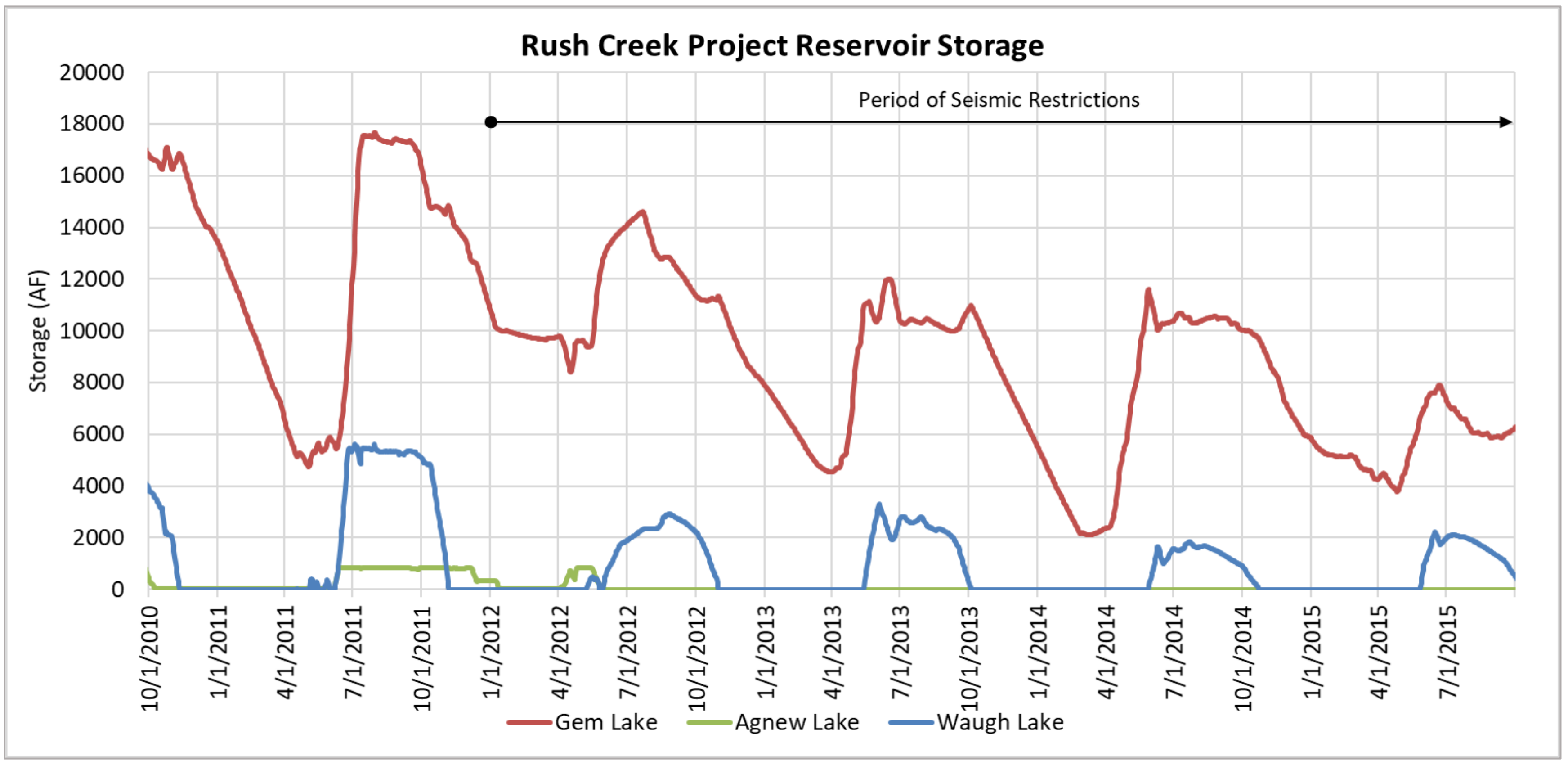



**Figure A-1. Rush Creek Project Reservoir Storage (WY 1990–2005)**



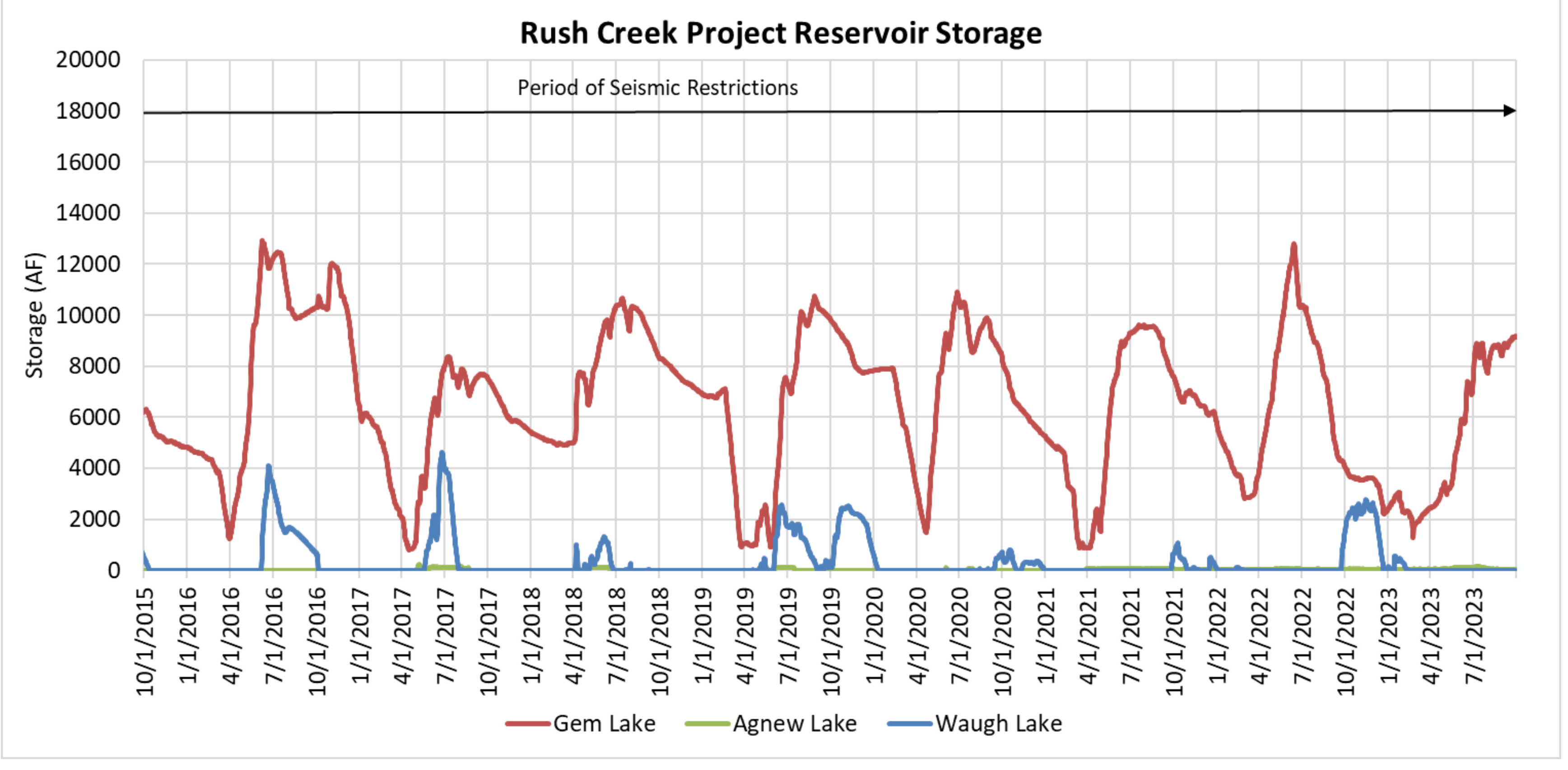
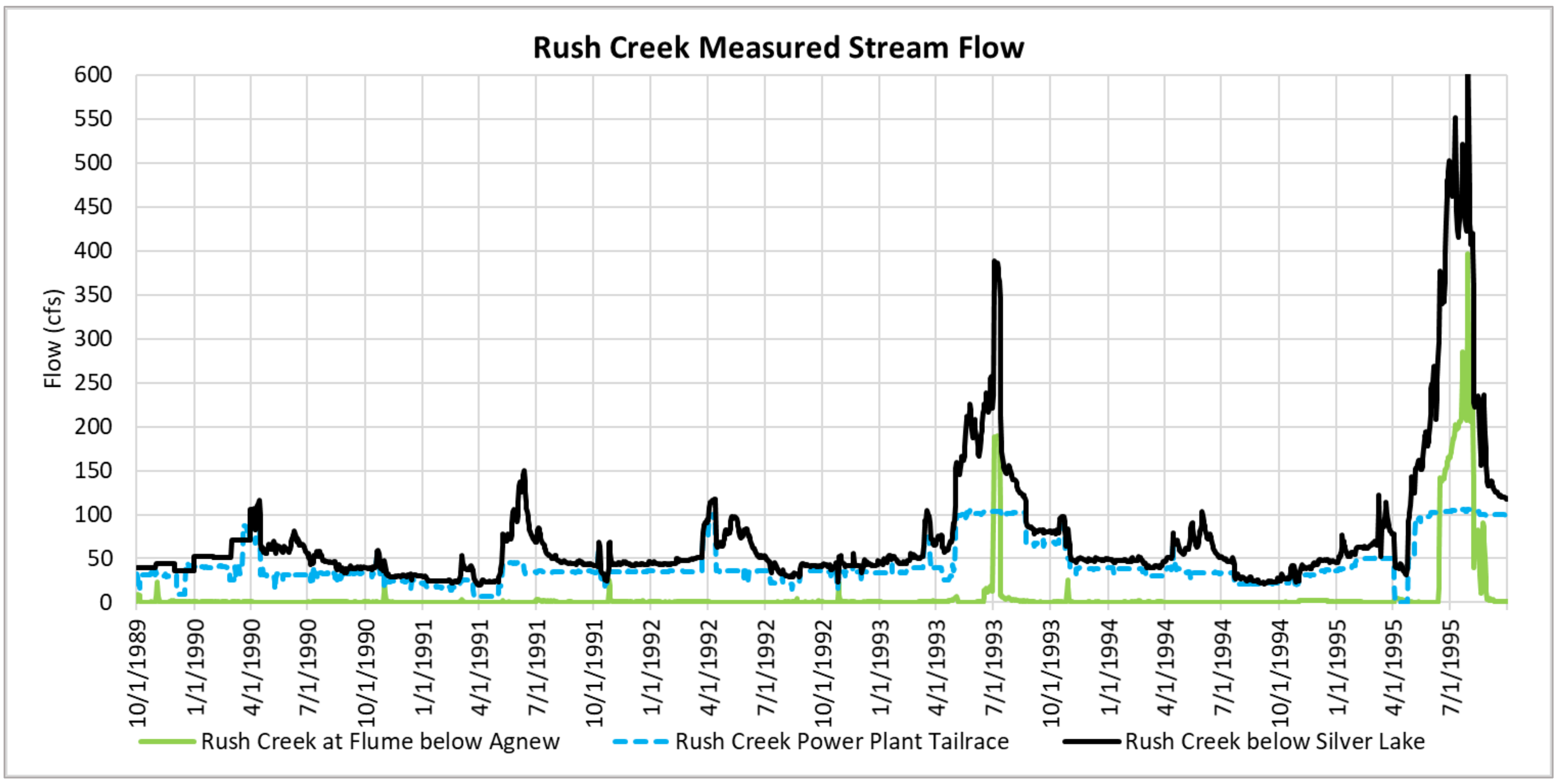
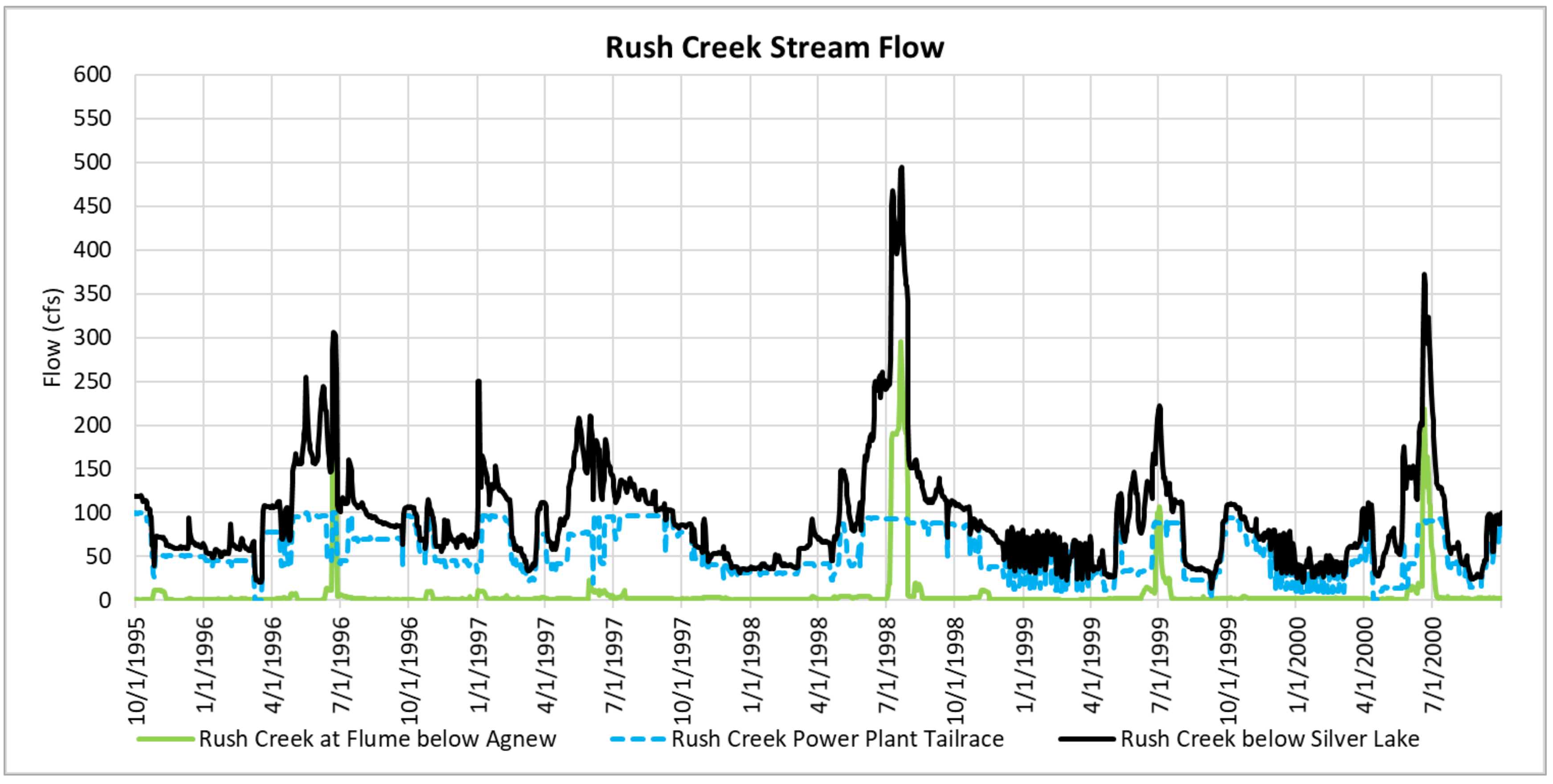




***Figure A-1 (continued). Rush Creek Project Reservoir Storage (WY 2006–2019)***



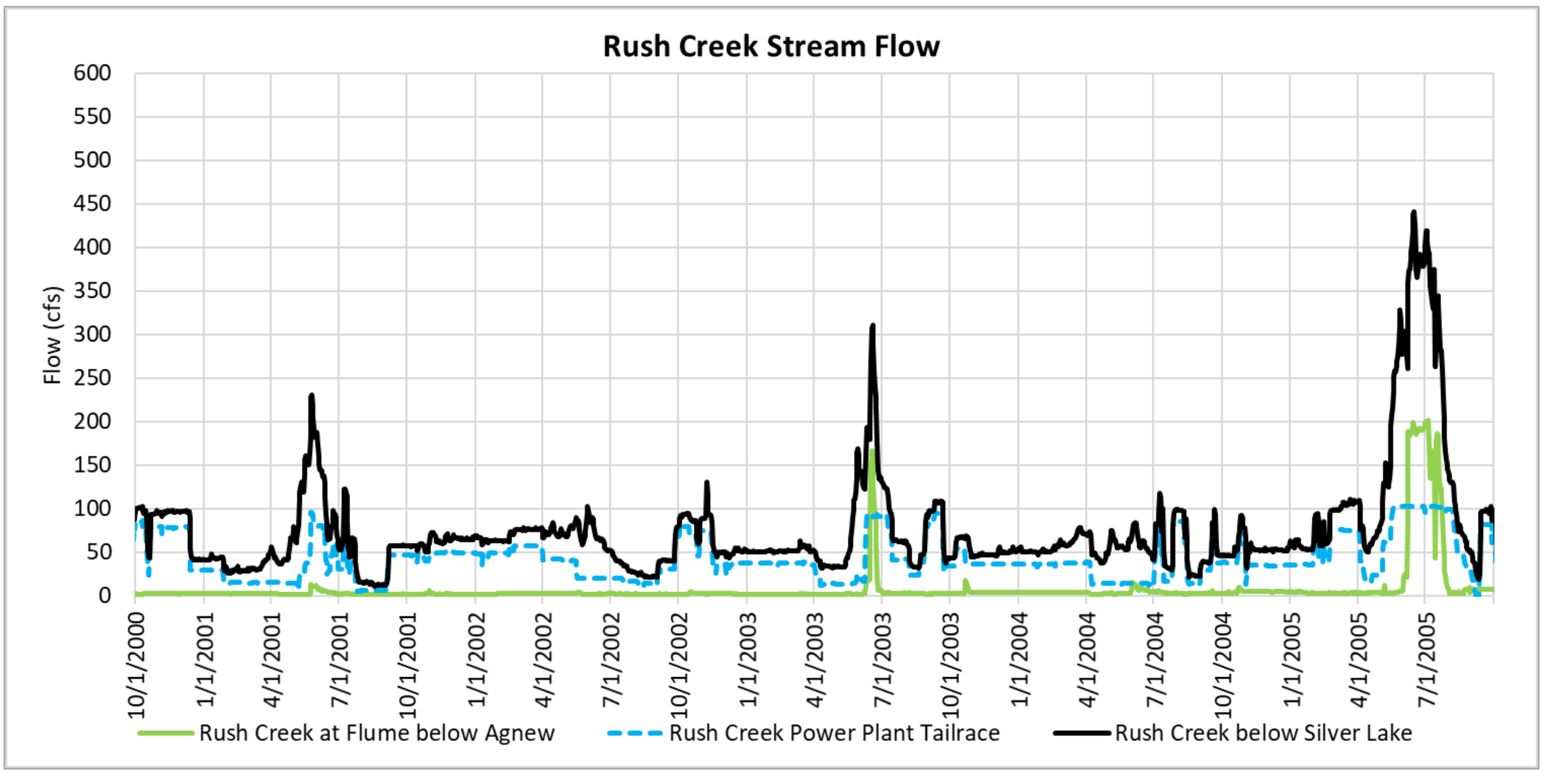
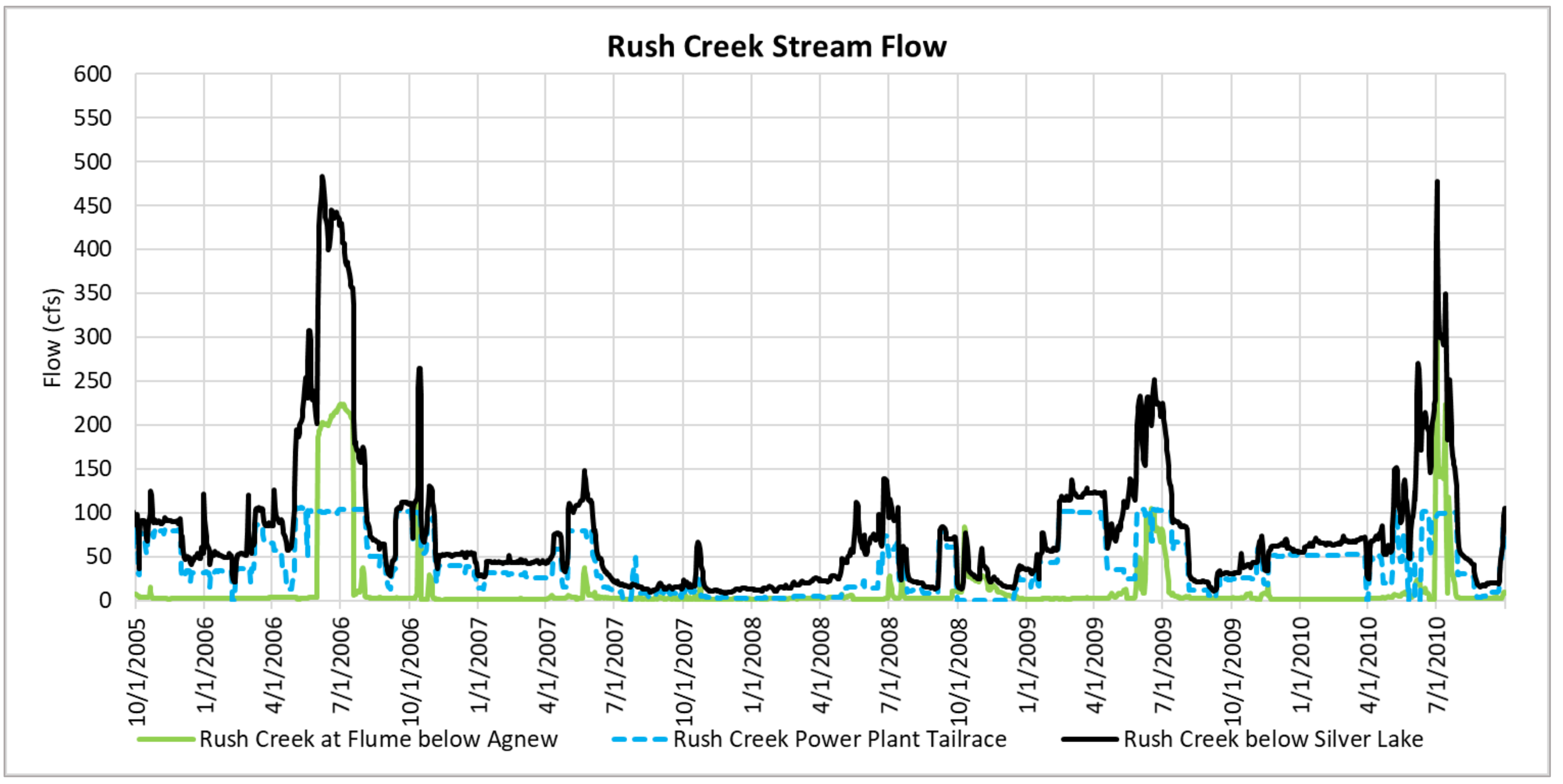
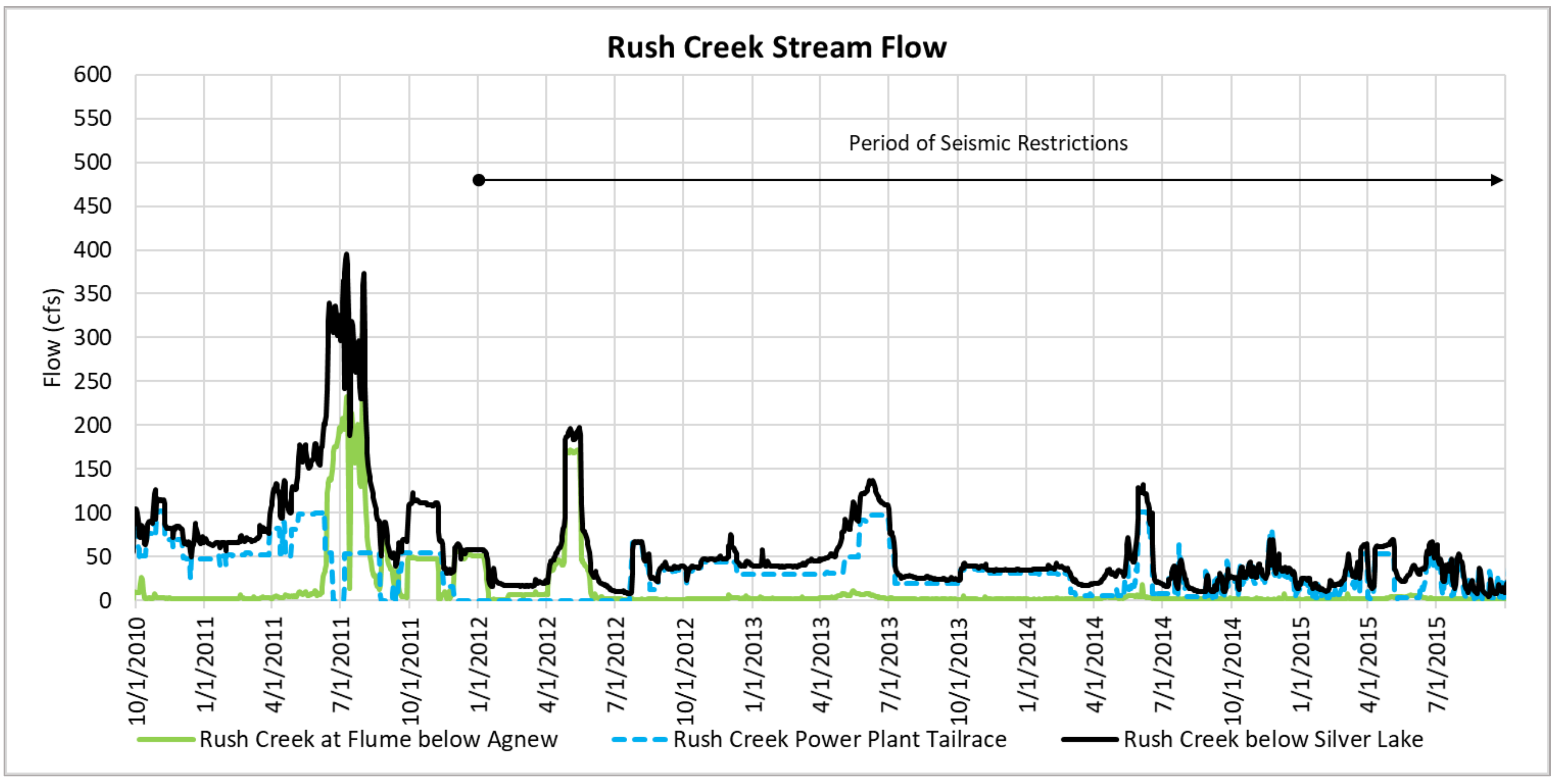




**Figure A-2. Rush Creek Measured Stream Flows (WY 1990–2022)**



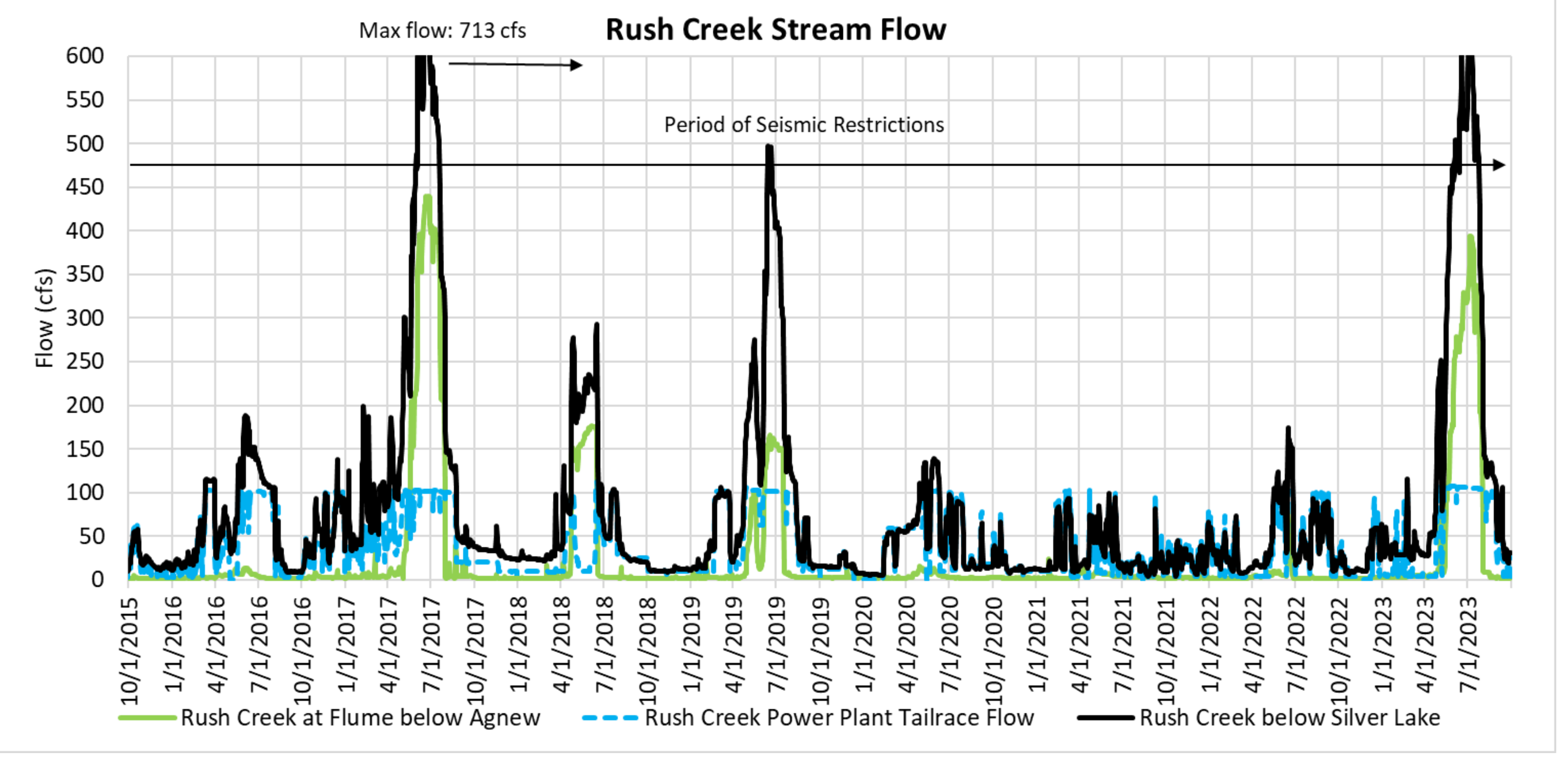




***Figure A-2 (continued). Rush Creek Measured Stream Flows (WY 1990–2022)***

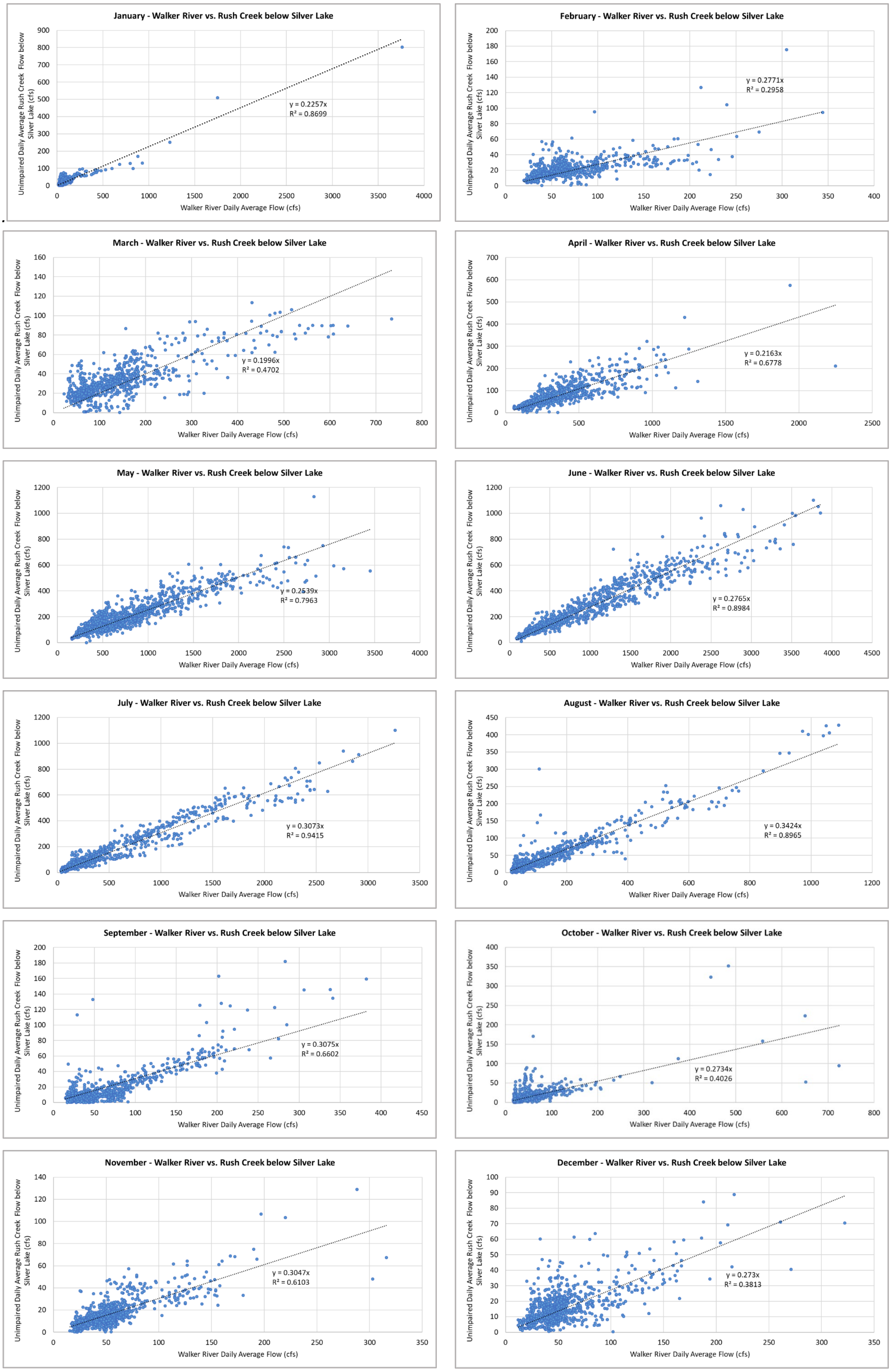



**Figure A-3. Monthly Walker River vs. Rush Creek Below Silver Lake Flows**

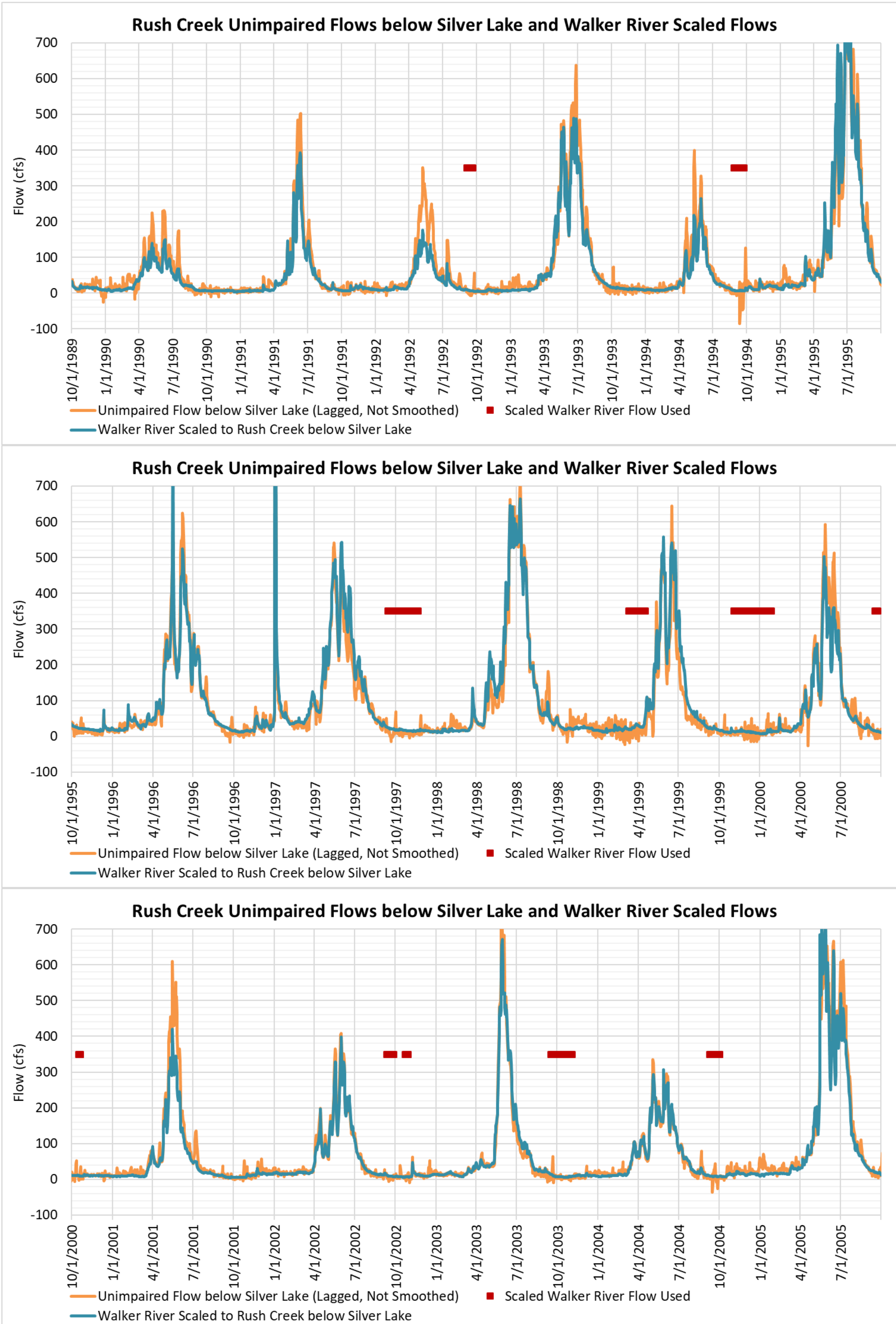
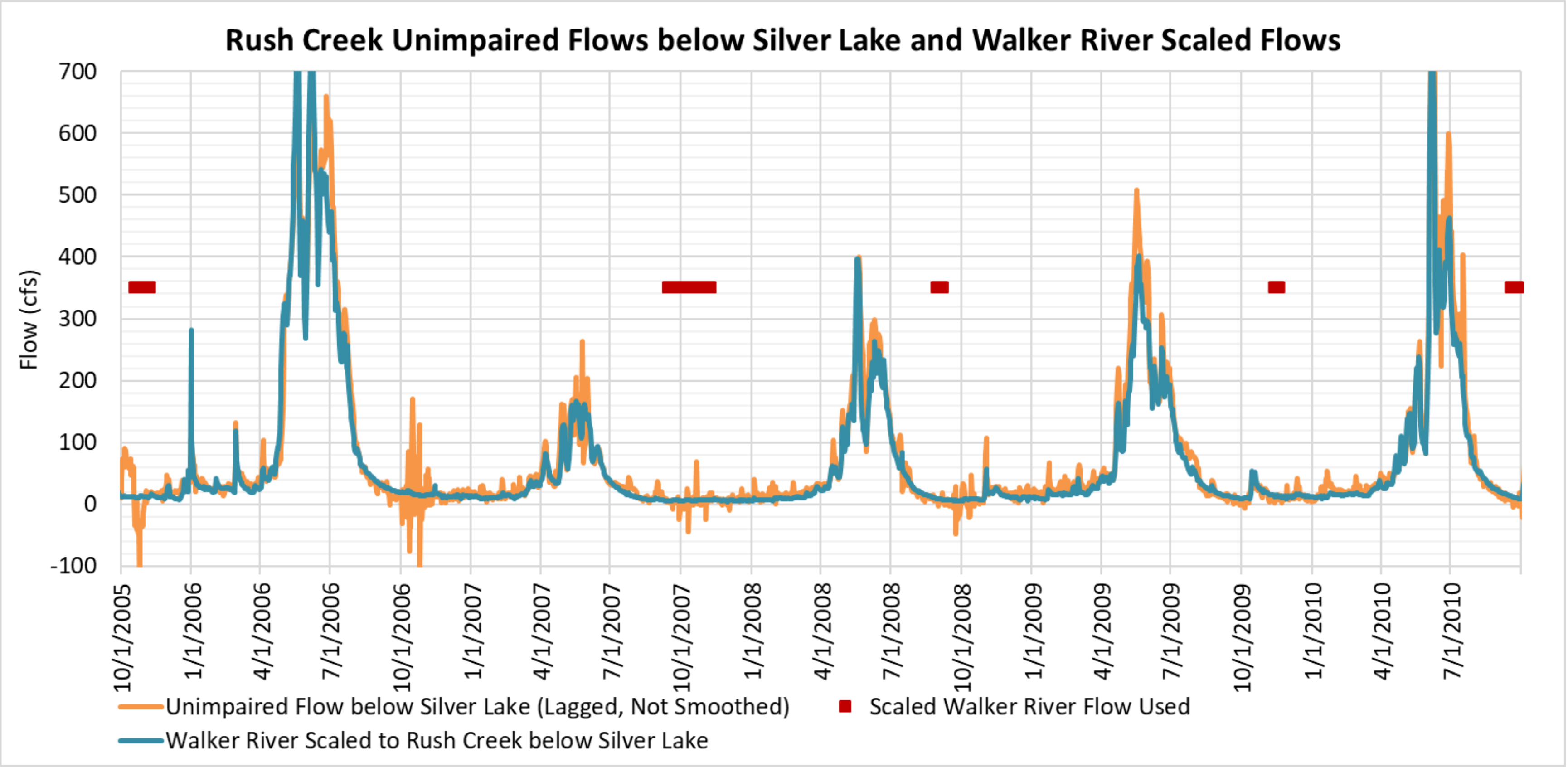
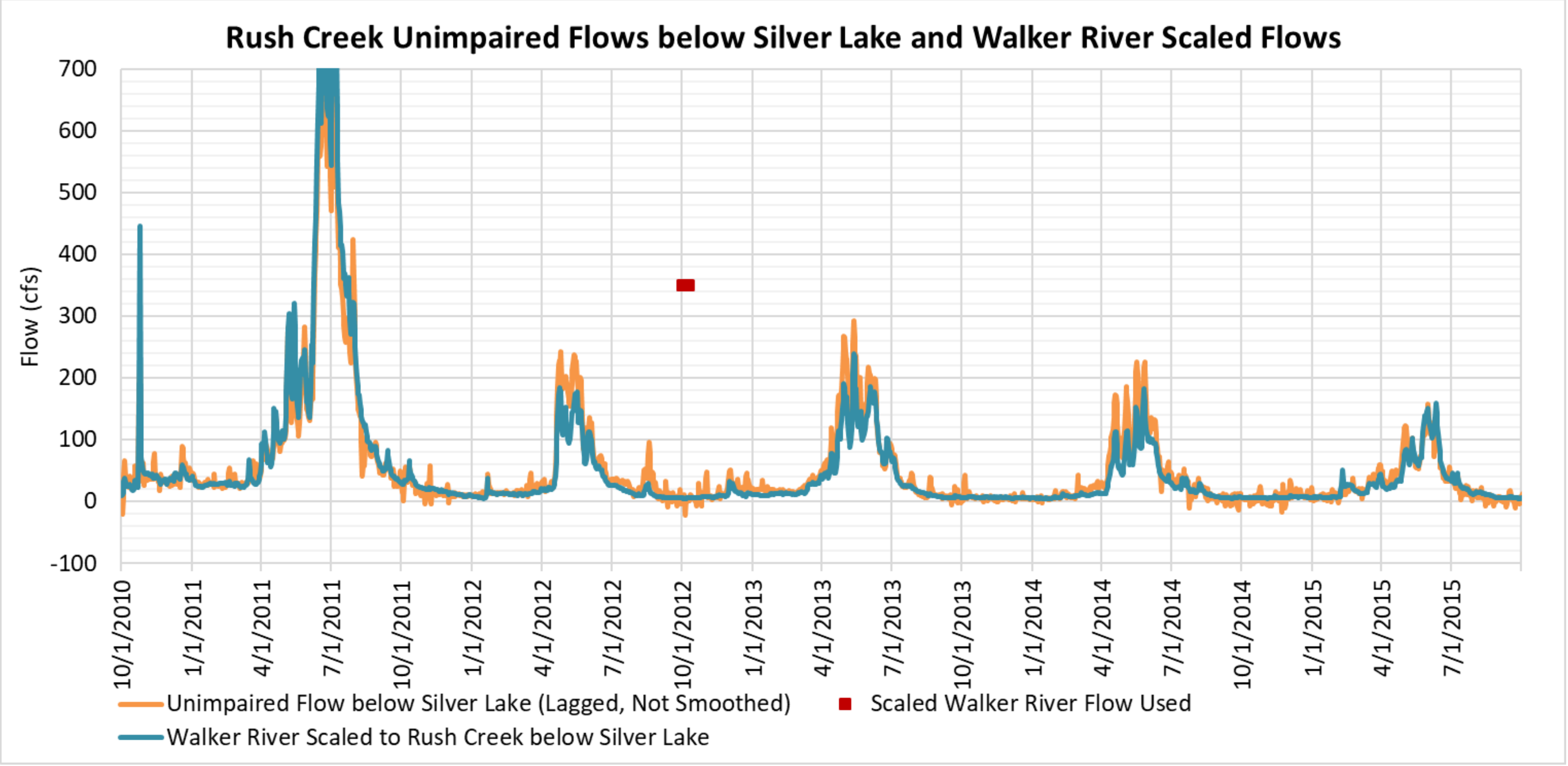



**Figure A-4. Rush Creek Unimpaired Flow Below Silver Lake (Not Smoothed) and Scaled Walker River Flows (WY 1990–2022)**



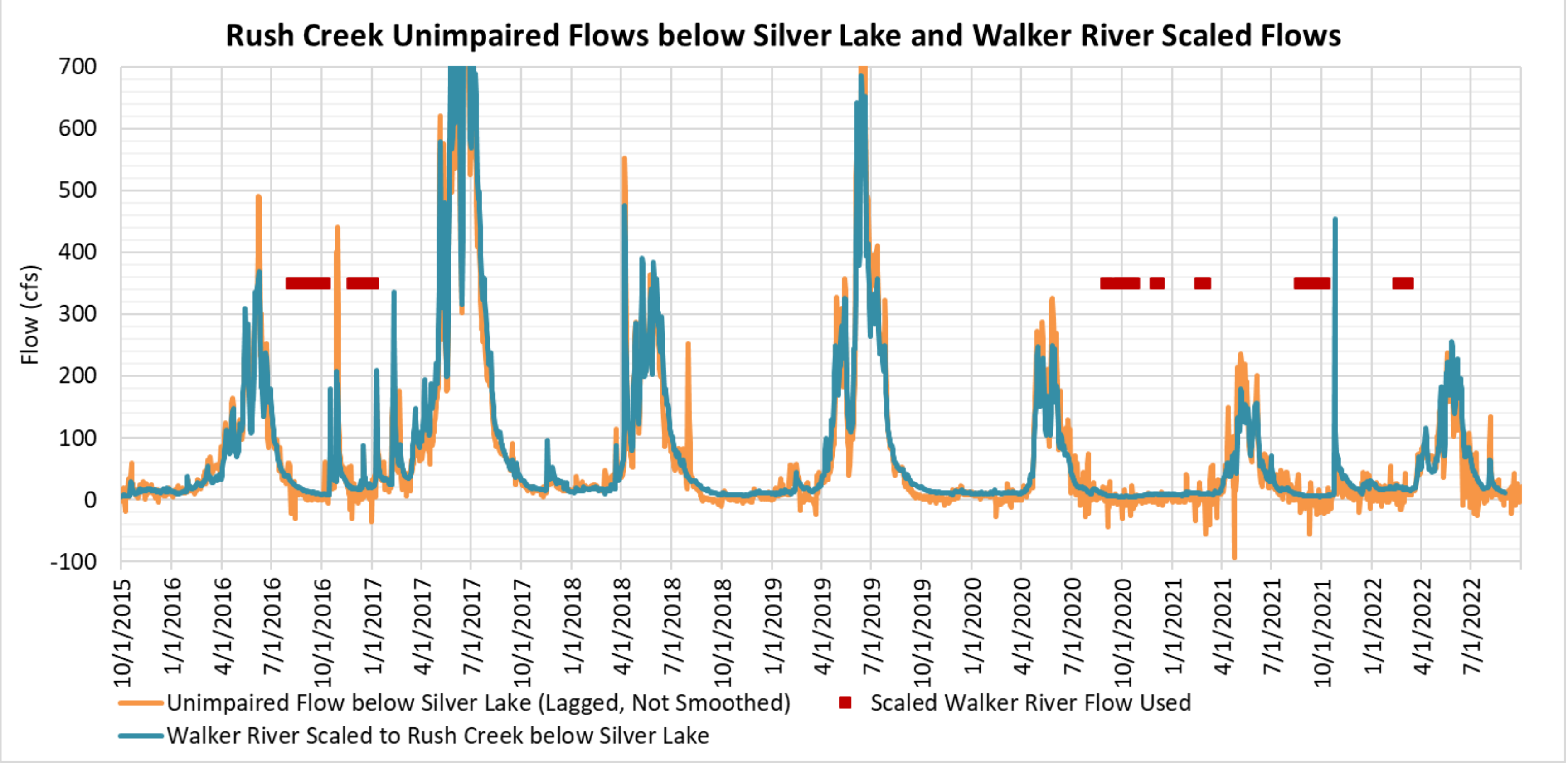
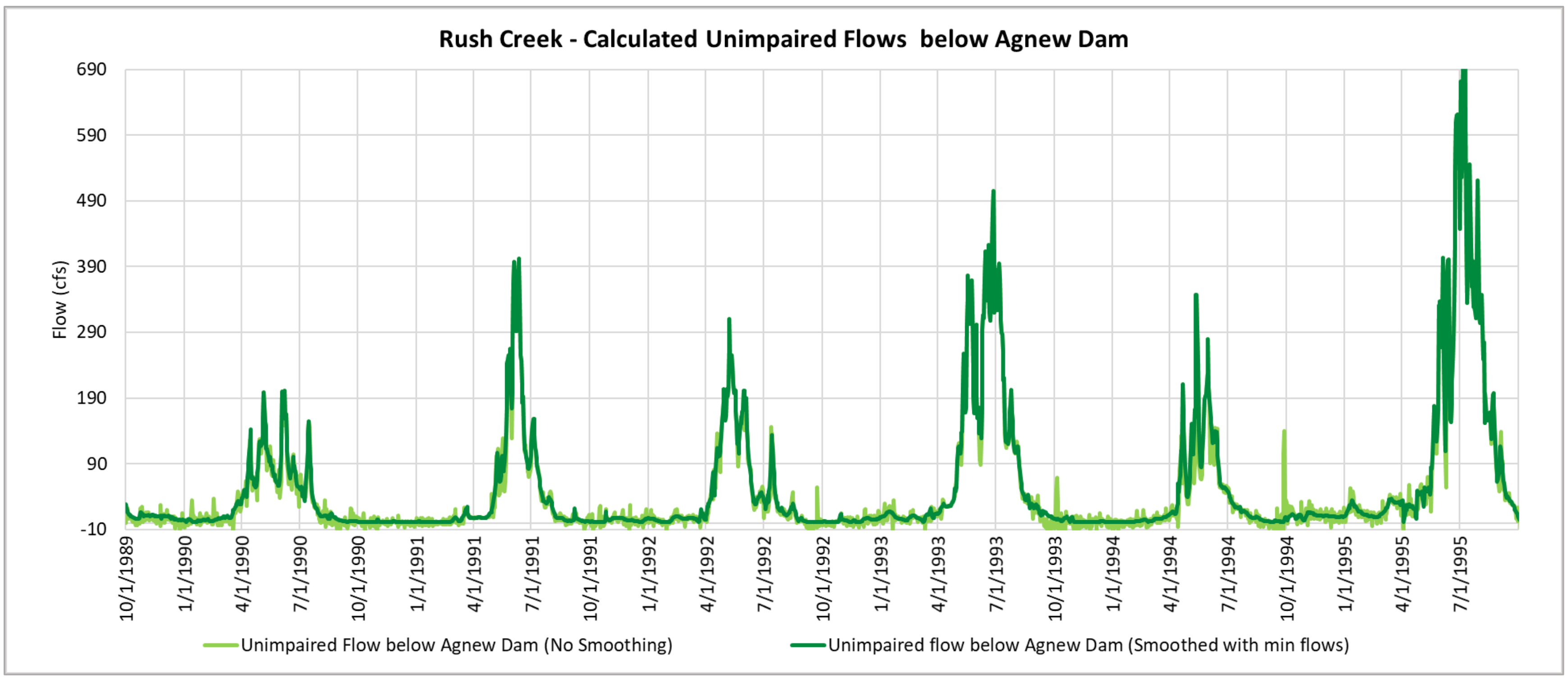
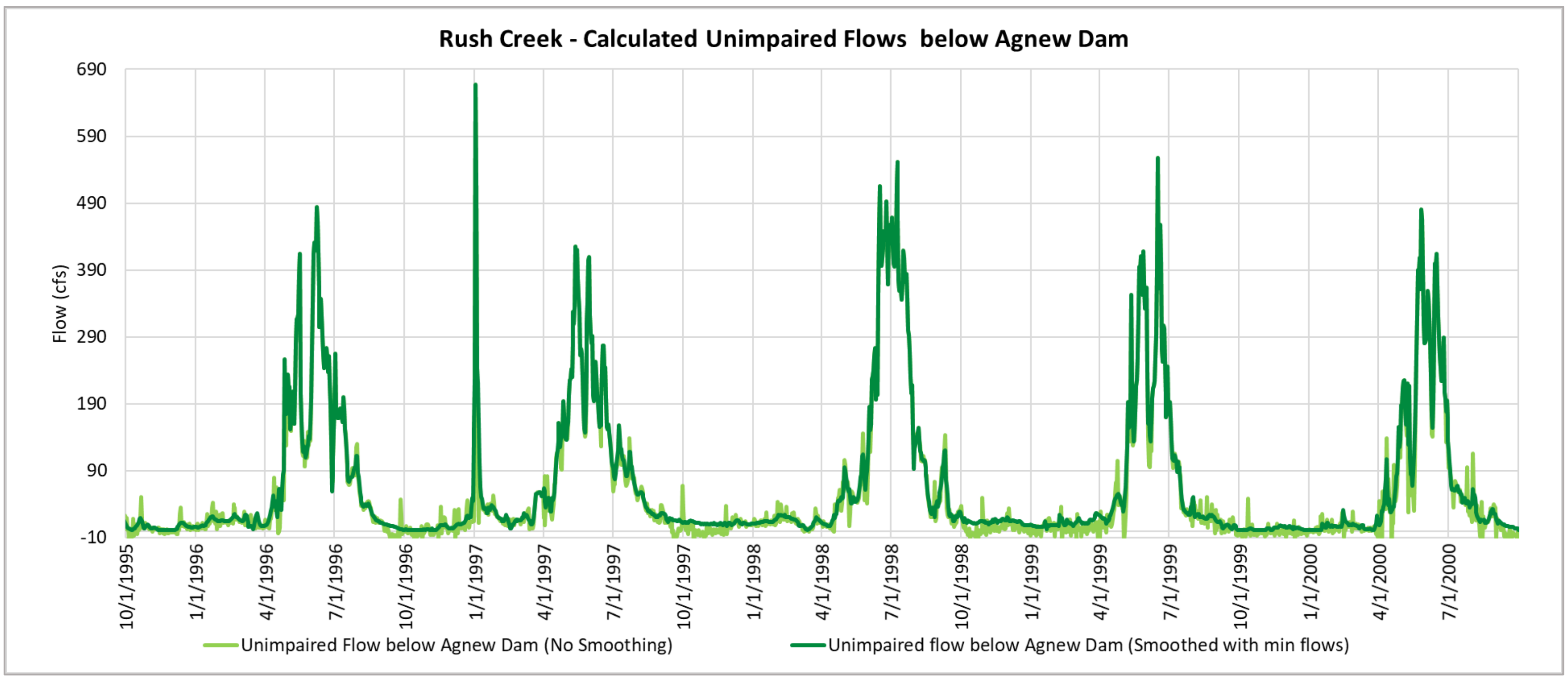




***Figure A-4 (continued).*** ***Rush Creek Unimpaired Flow Below Silver Lake (Not Smoothed) and Scaled Walker River Flows (WY 1990–2022)***



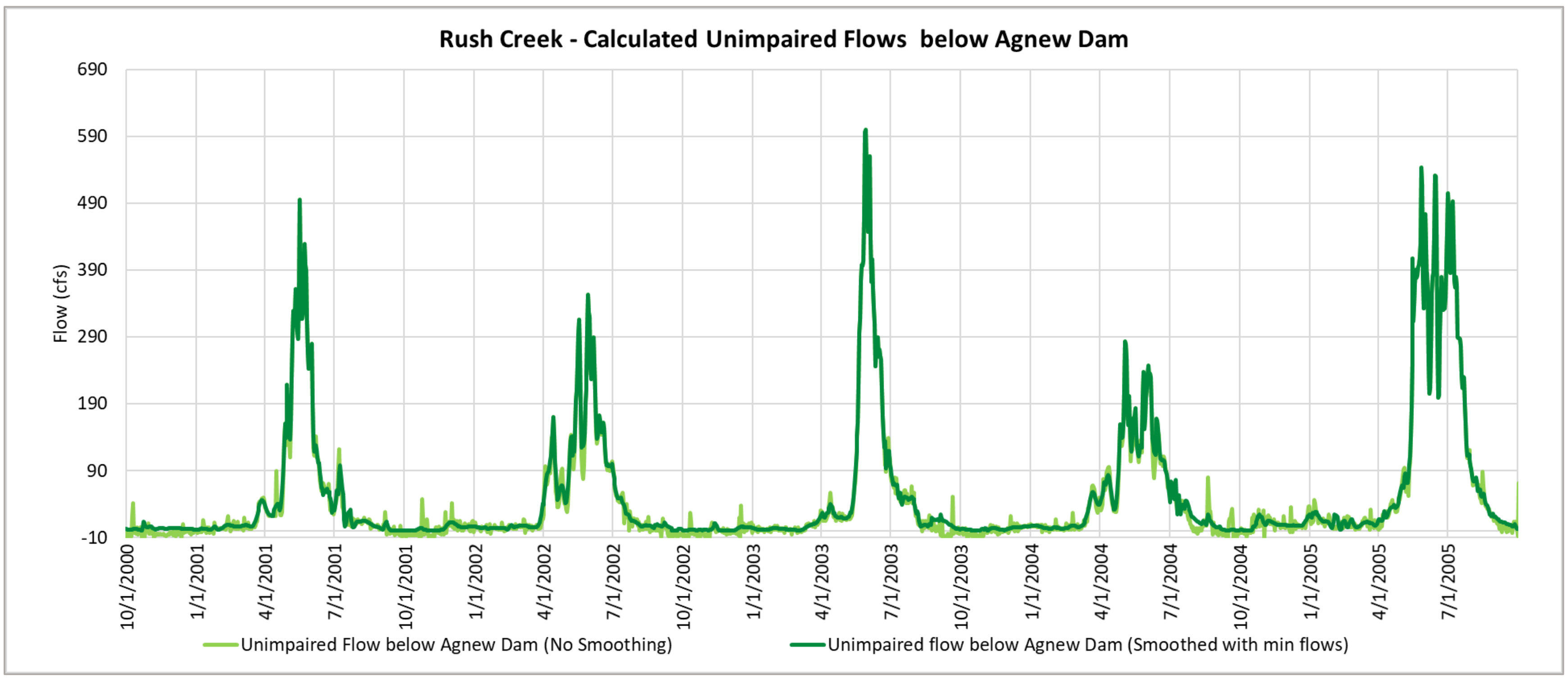
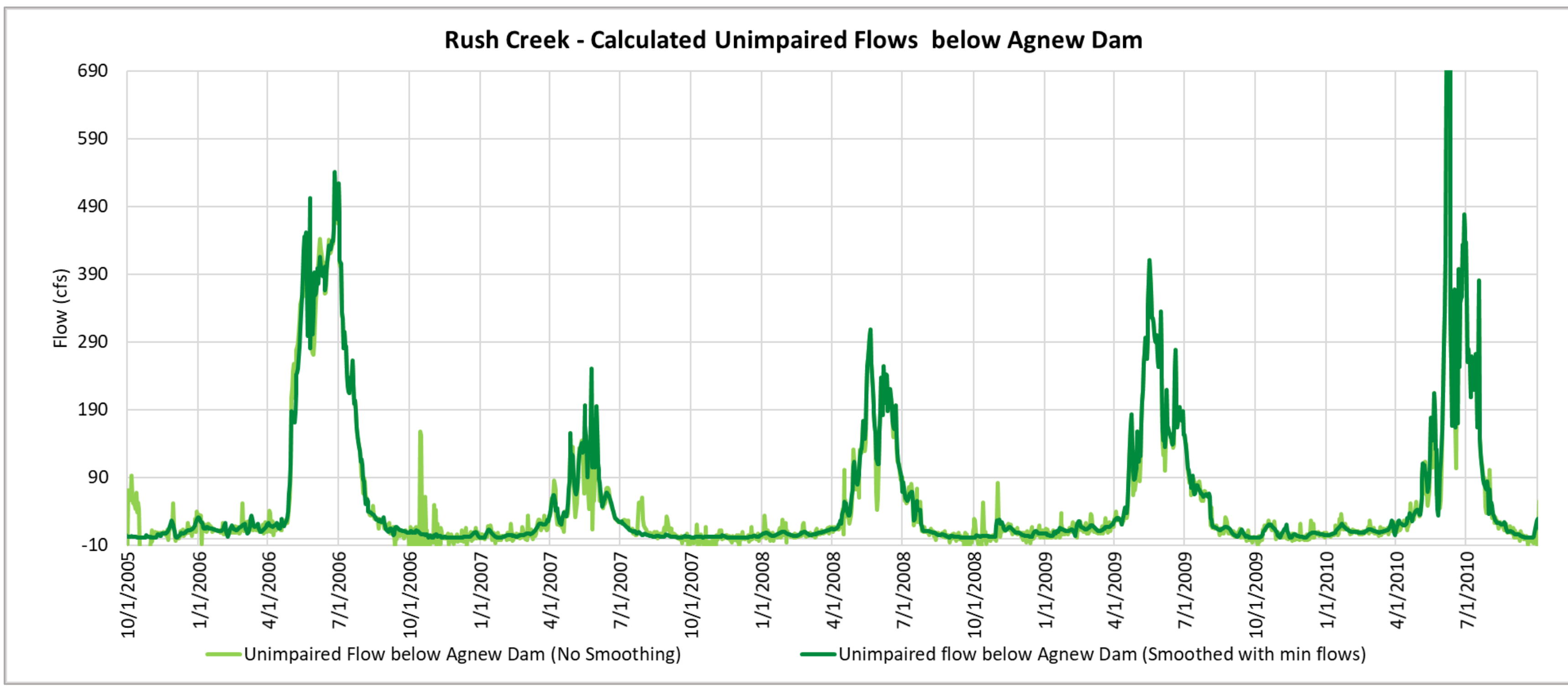
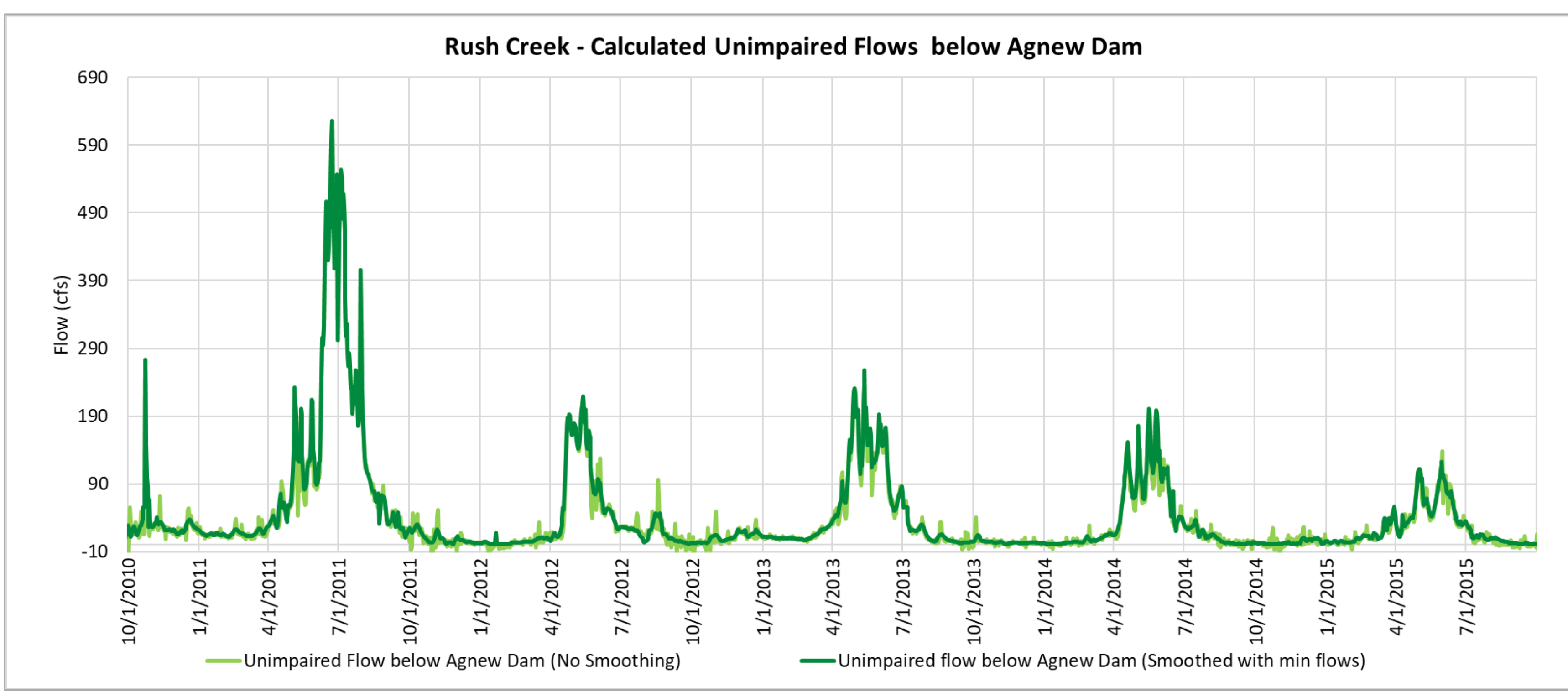




**Figure A-5. Rush Creek Raw vs. Smoothed Calculated Unimpaired Flows Below Agnew Dam (WY 1990–2022)**



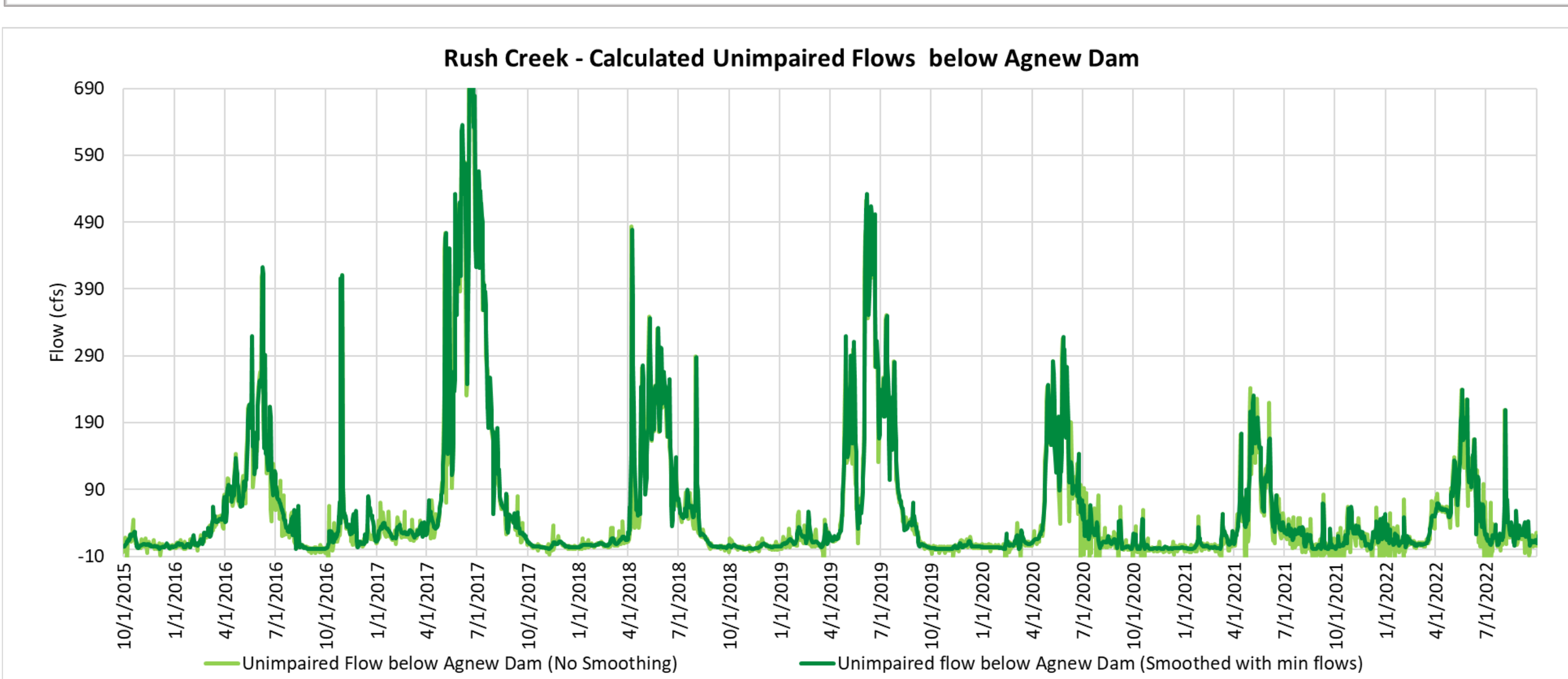




***Figure A-5 (continued). Rush Creek Raw vs. Smoothed Calculated Unimpaired Flows Below Agnew Dam (WY 1990–2022)***

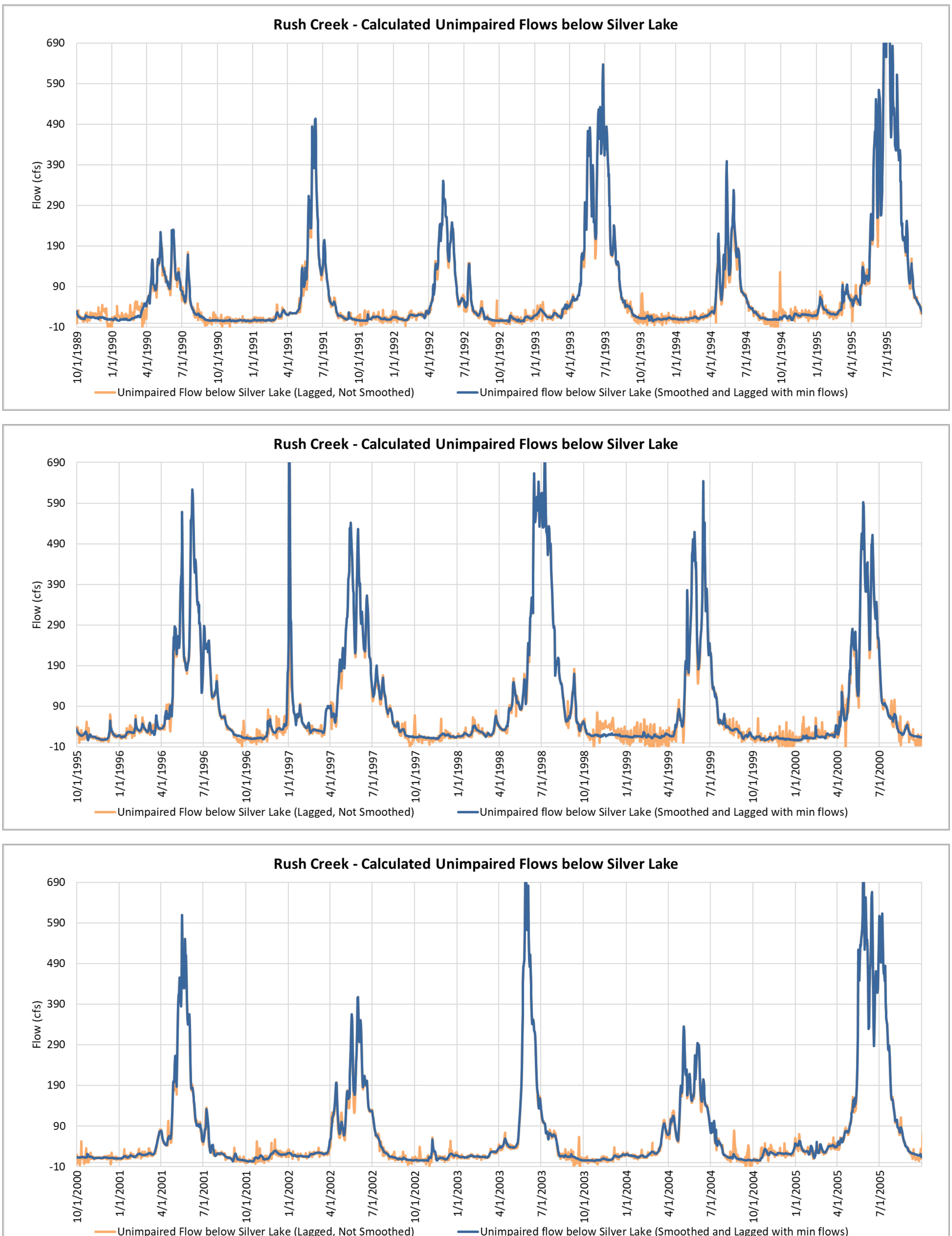
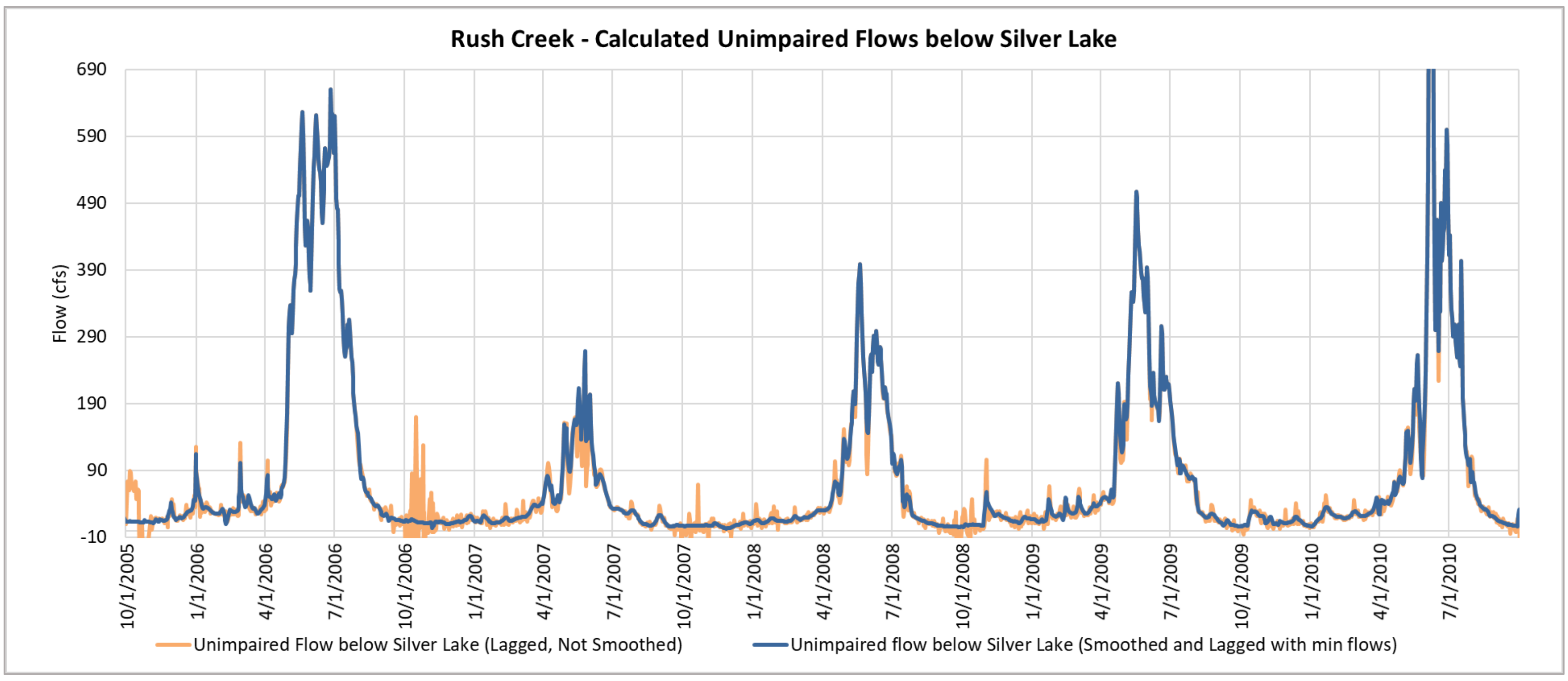
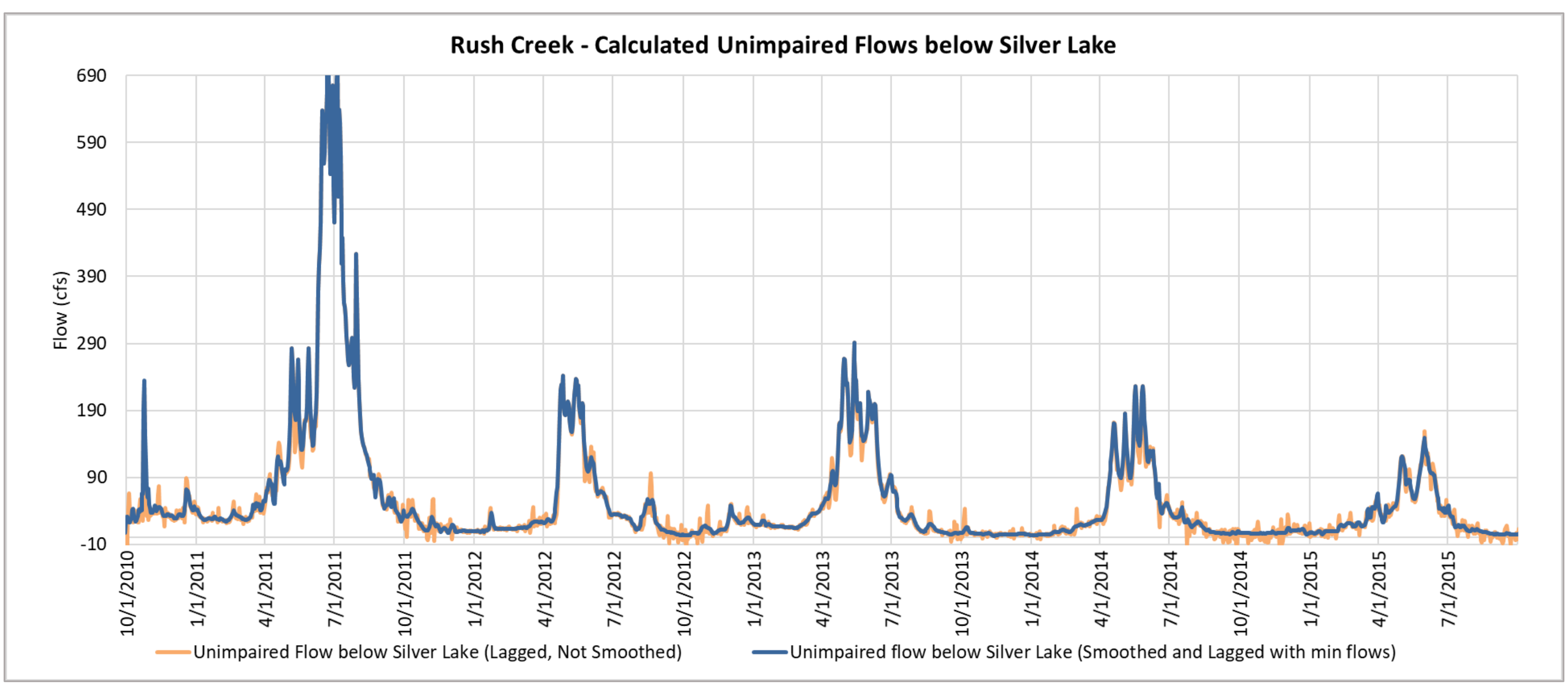



**Figure A-6. Rush Creek Raw vs. Smoothed Calculated Unimpaired Flows Below Silver Lake (WY 1990–2022)**



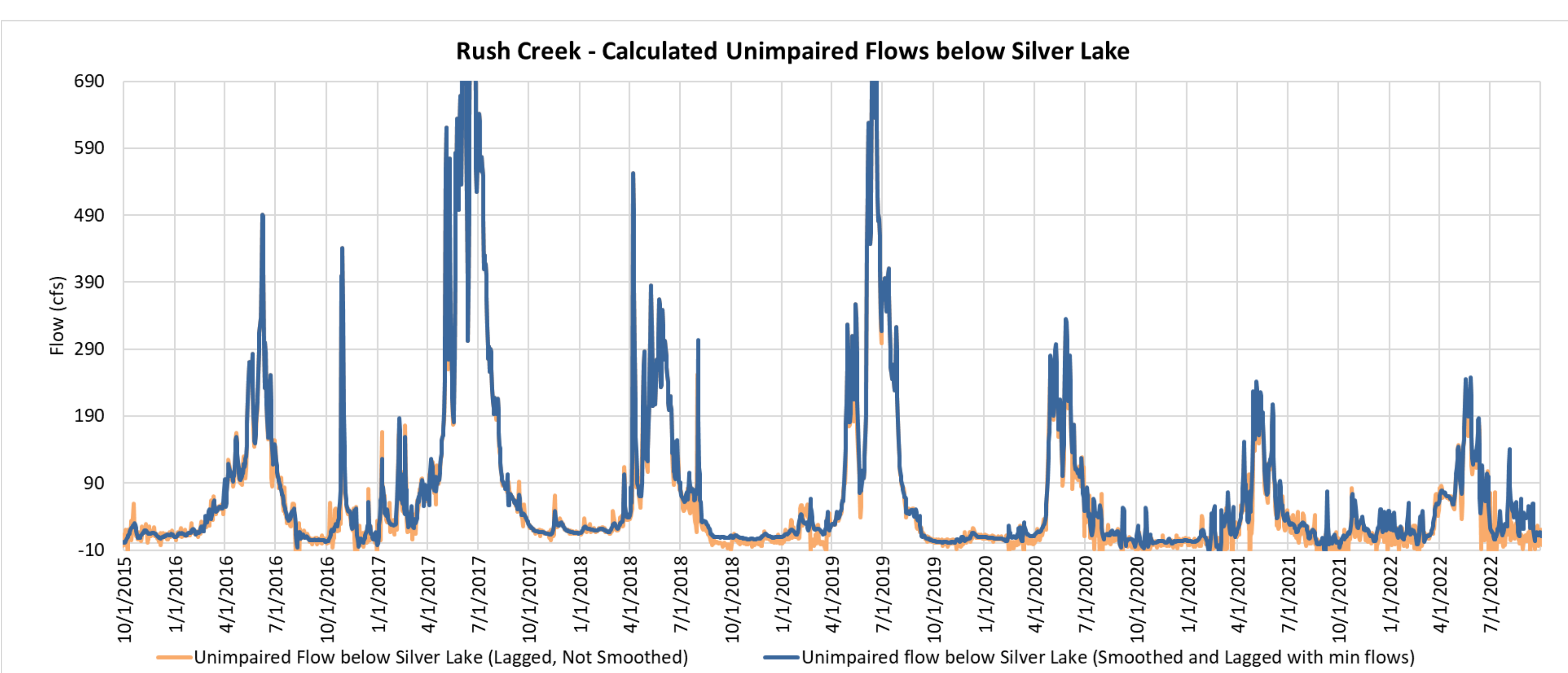




***Figure A-6 (continued).*** ***Rush Creek Raw vs. Smoothed Calculated Unimpaired Flows Below Silver Lake (WY 1990–2022)***

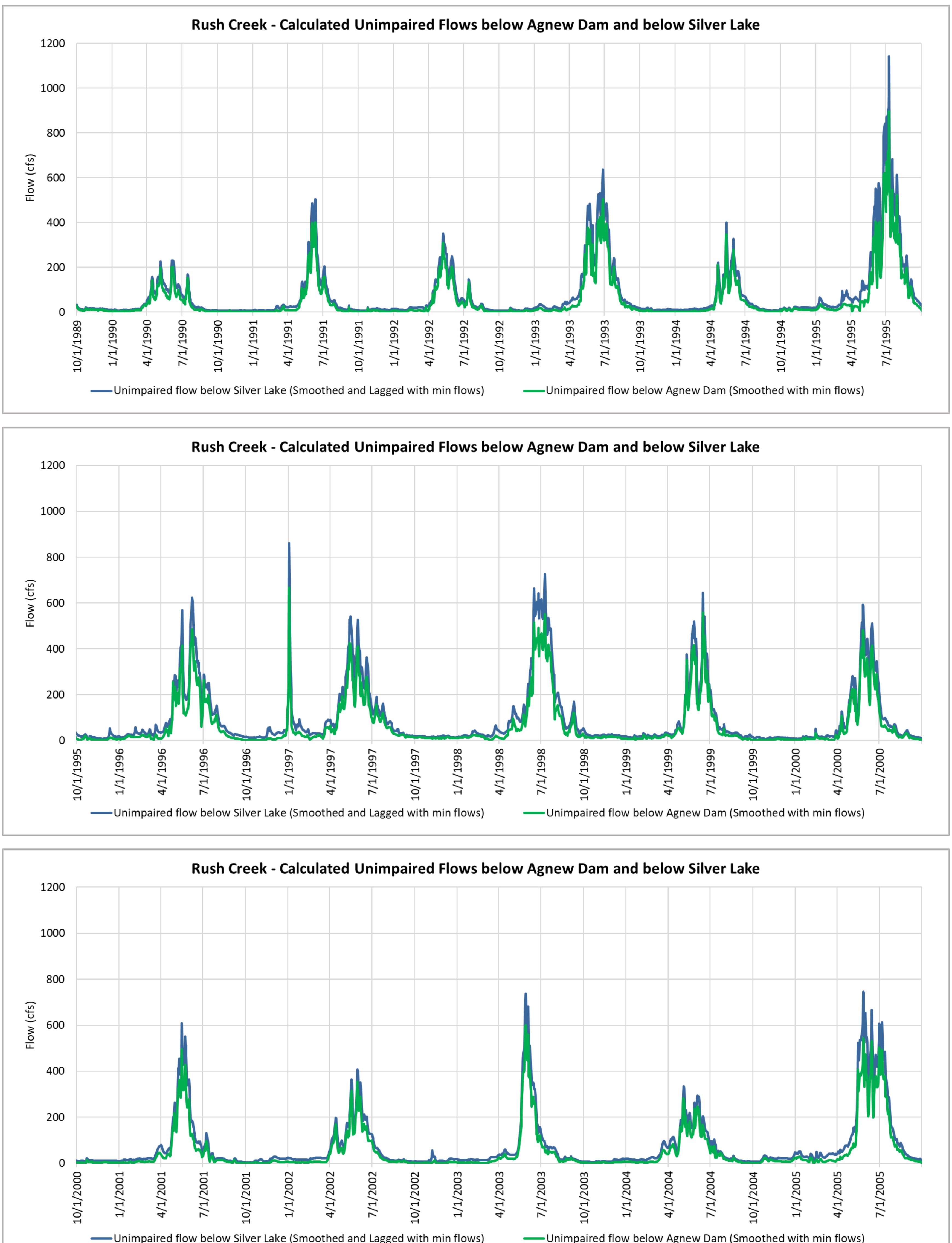
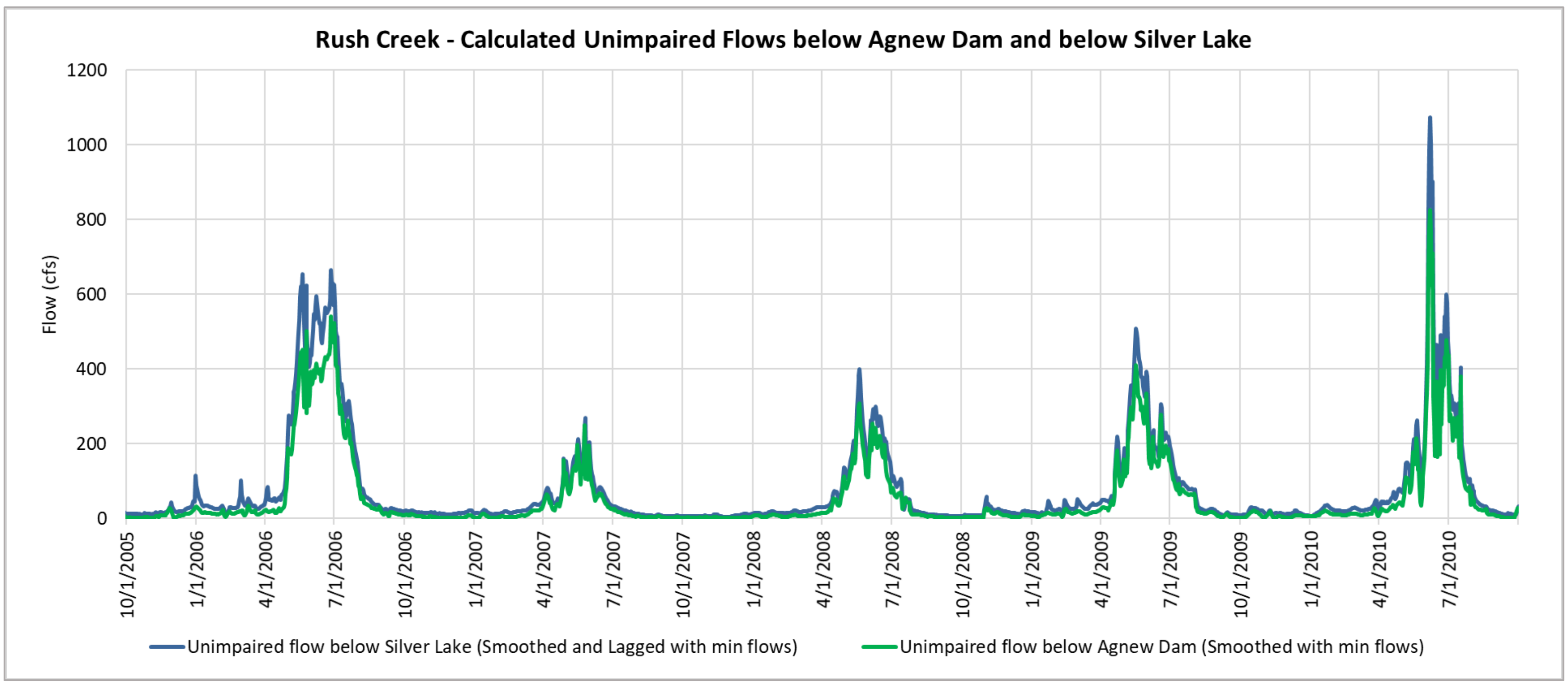
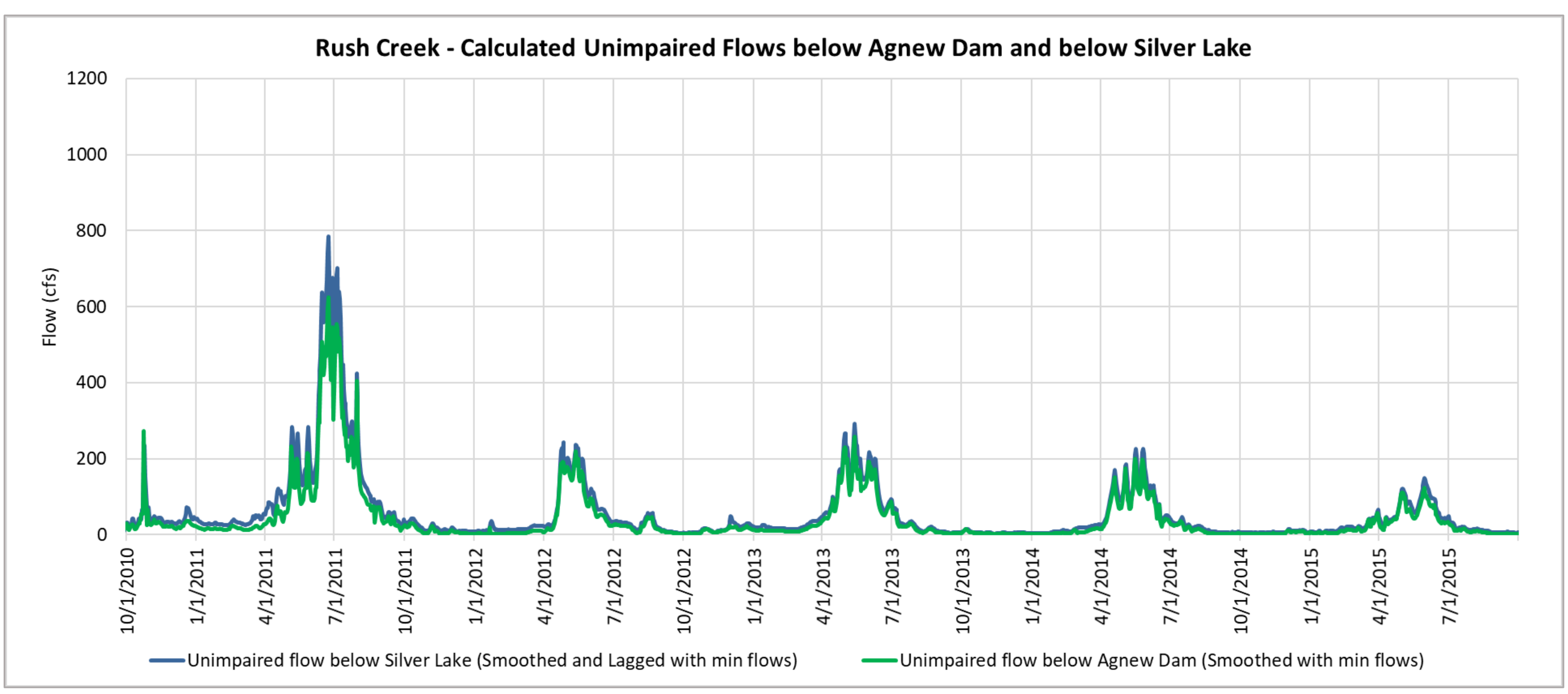



**Figure A-7. Rush Creek Final Unimpaired Flows Below Agnew Dam and Below Silver Lake (WY 1990–2022)**



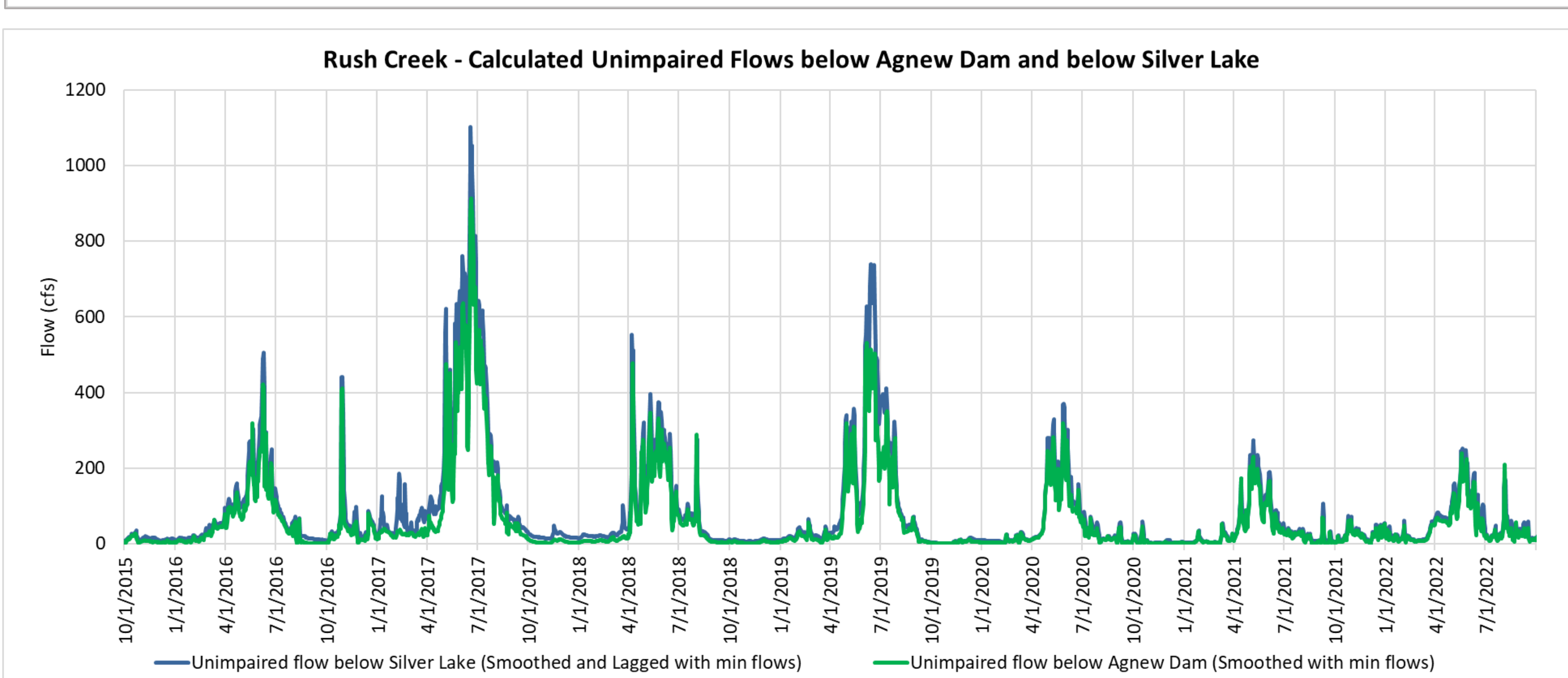




***Figure A-7 (continued). Rush Creek Final Unimpaired Flows Below Agnew Dam and Below Silver Lake (WY 1990–2022)***

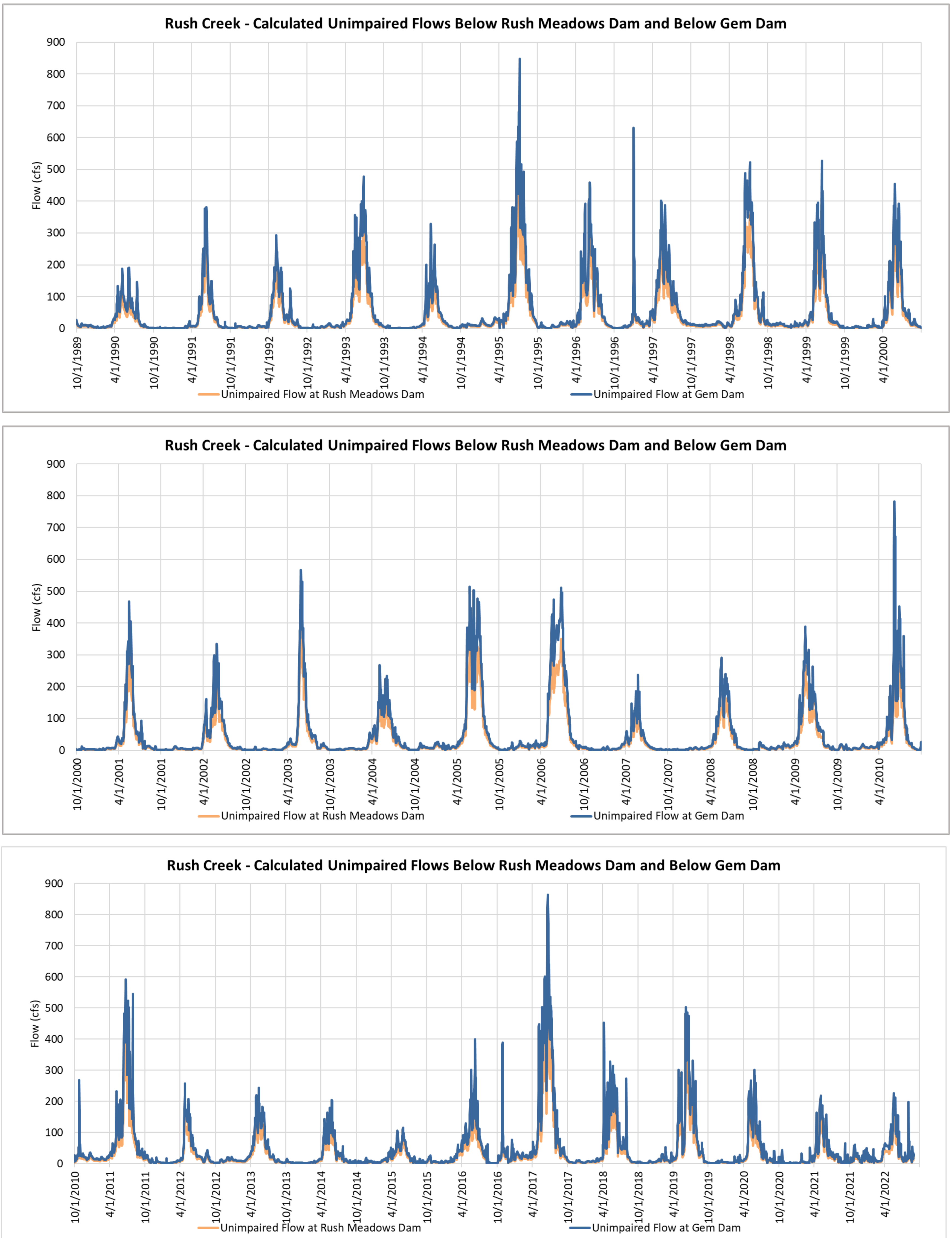
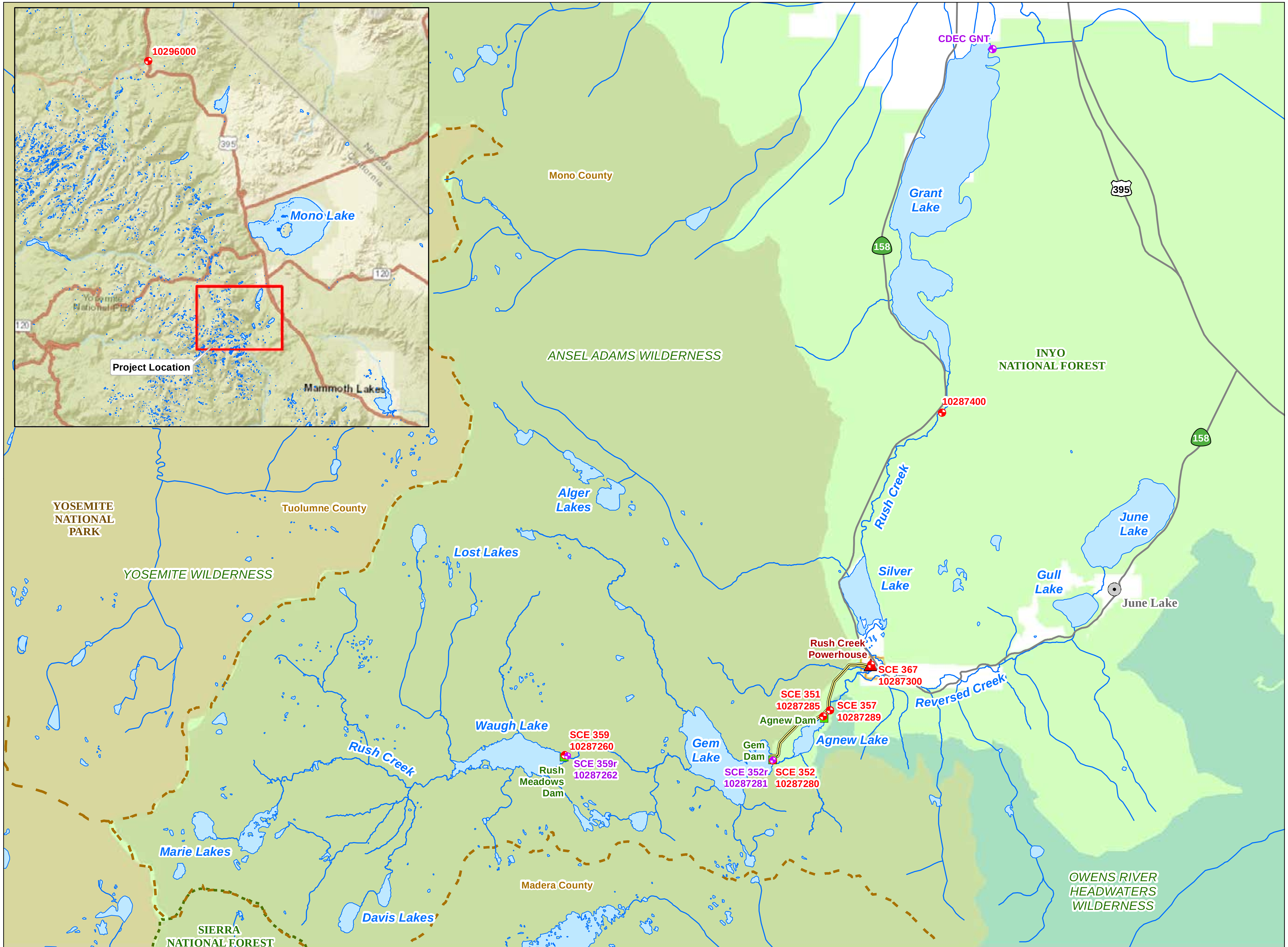



**Figure A-8. Rush Creek Final Unimpaired Flows at Rush Meadows Dam and Gem Dam (WY 1990–2022)**

# MAPS




**SCE Facilities**

- Dam
- Powerhouse
- Flowline / Penstock
- FERC Boundary

**Other Features**

- 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.

**Gages used for Unimpaired Flow Calculations**

- Unimpaired Calculation
- Comparison Only

SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead℠

Rush Creek Project (FERC 1389)

**Map A-1**

**Sources and Locations of Gaged Flow Data**

N S W E

0 0.5 1 Miles

Date: 5/10/2024

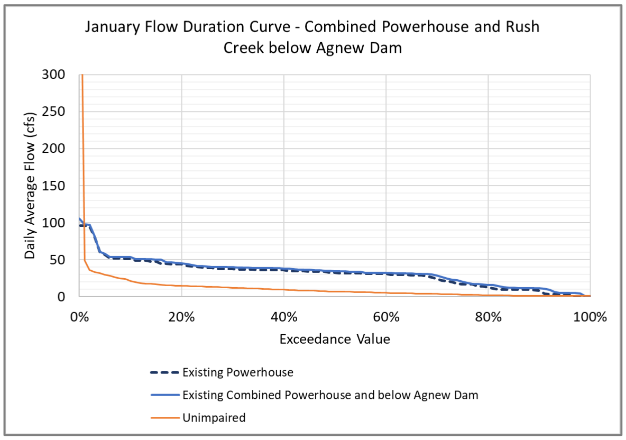
**Projection: UTM Zone 11**
**Datum: NAD 83**

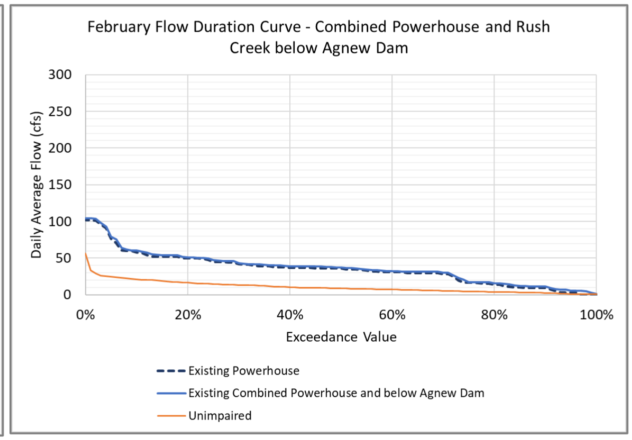


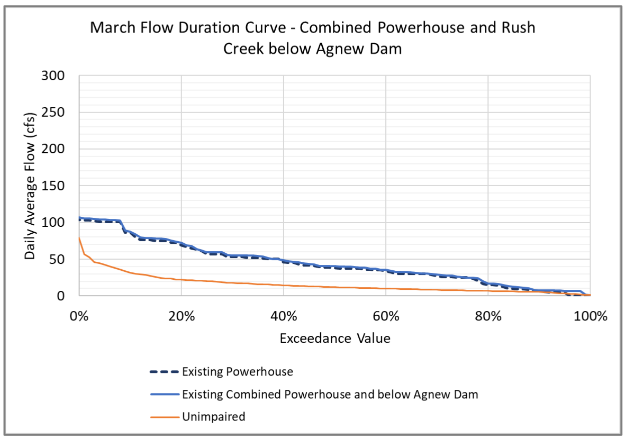
C:\GIS\237800343\map\Rush Creek\HydroMaps\SCE_RUSH_CREEK_Gages_UnimpairedFlow_17i11i_02.mxd

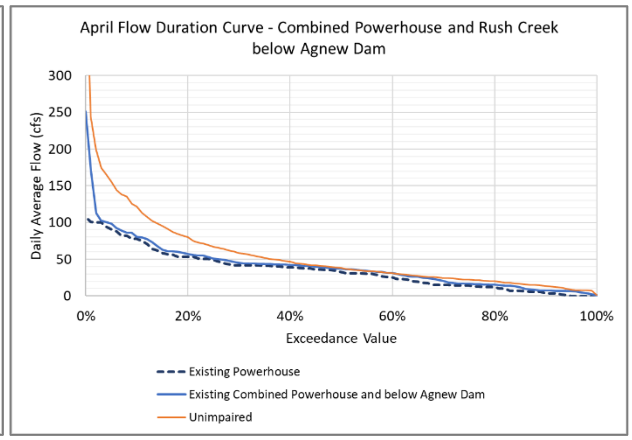
# APPENDIX 8.2-B

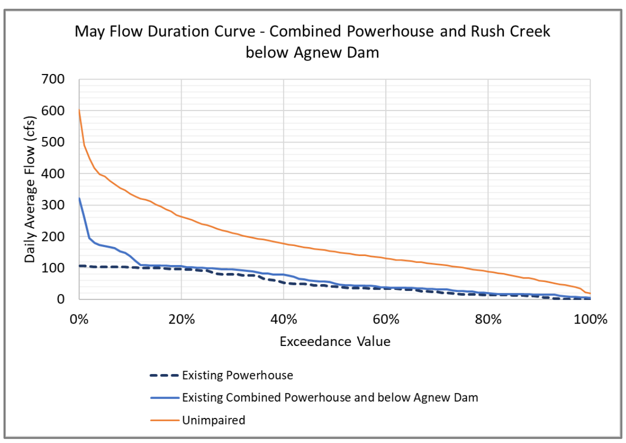
## Existing and Unimpaired Monthly Flow Duration Curves (1989–2019)



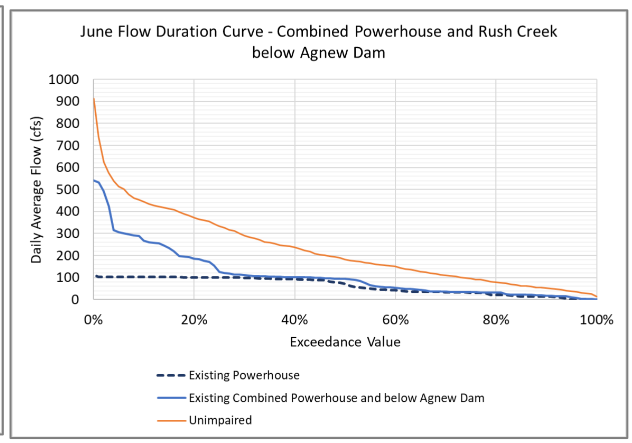




**Figure B-1. Monthly Flow Duration Curves for Combined Powerhouse and Rush Creek Below Agnew Dam, Existing and Unimpaired Flows (January–June)**

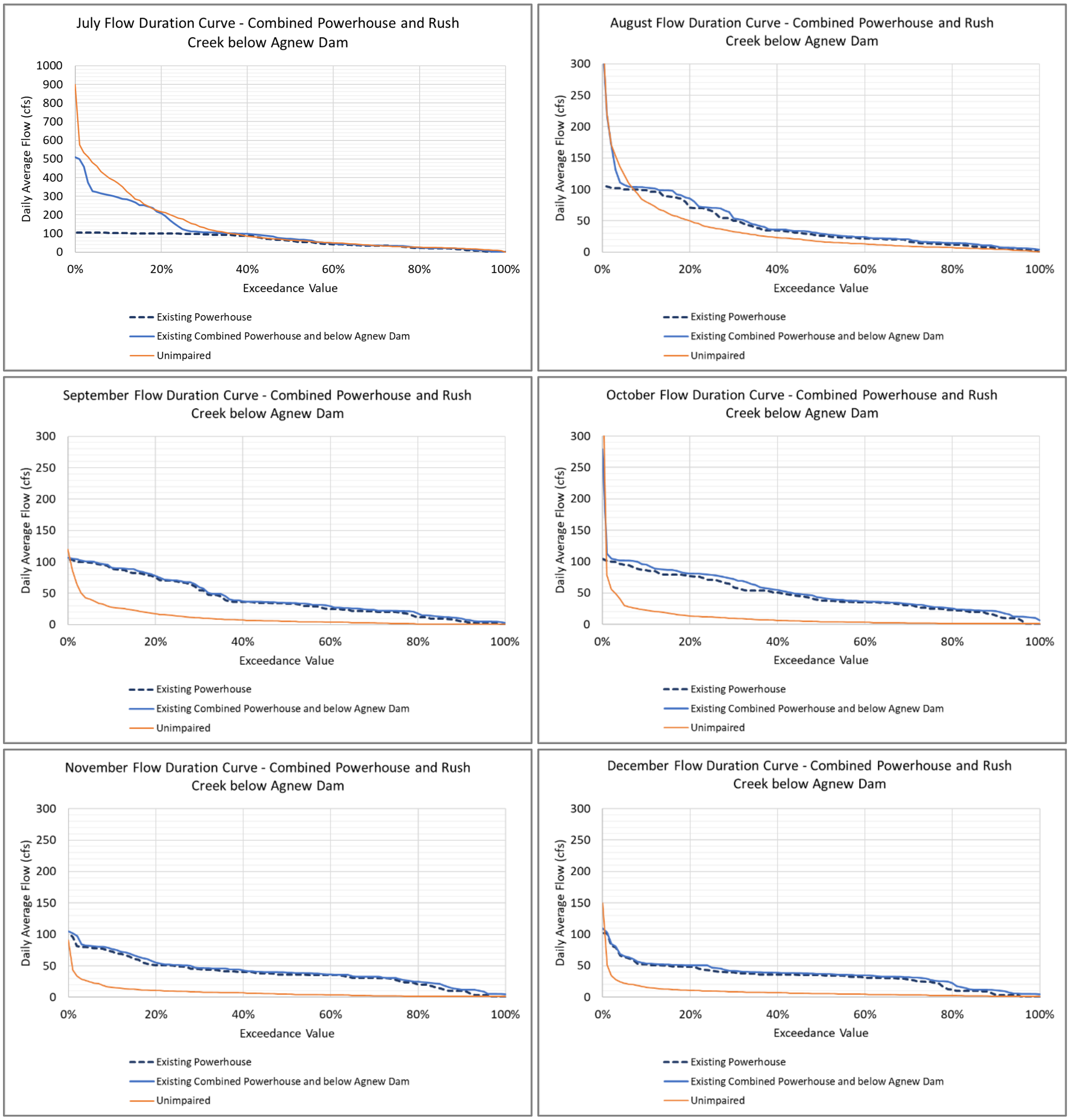



**Figure B-2. Monthly Flow Duration Curves for Combined Powerhouse and Rush Creek Below Agnew Dam, Existing and Unimpaired Flows (July–December)**

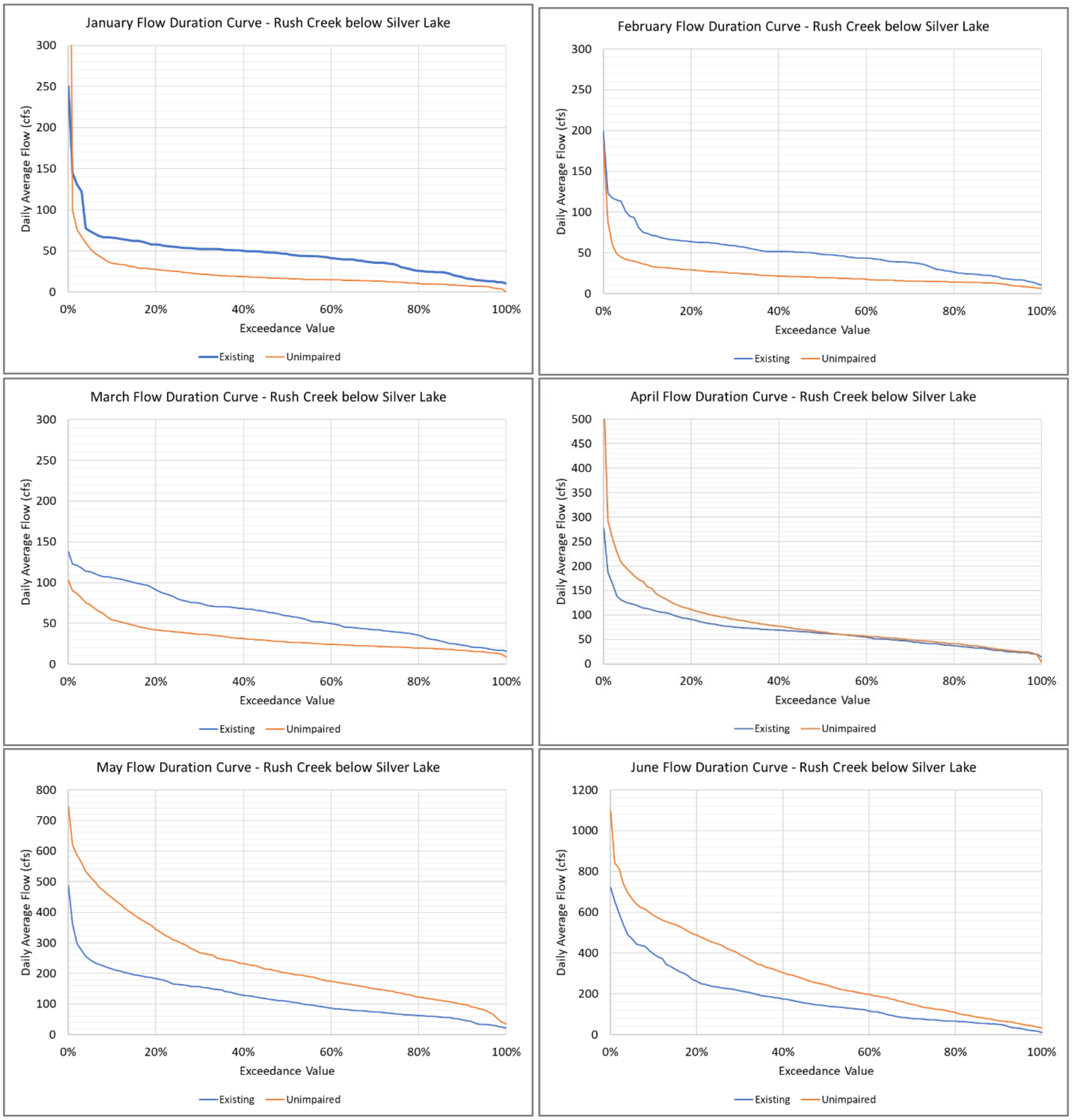



**Figure B-3. Monthly Flow Duration Curves for Rush Creek Below Silver Lake, Existing and Unimpaired Flows (January–June)**

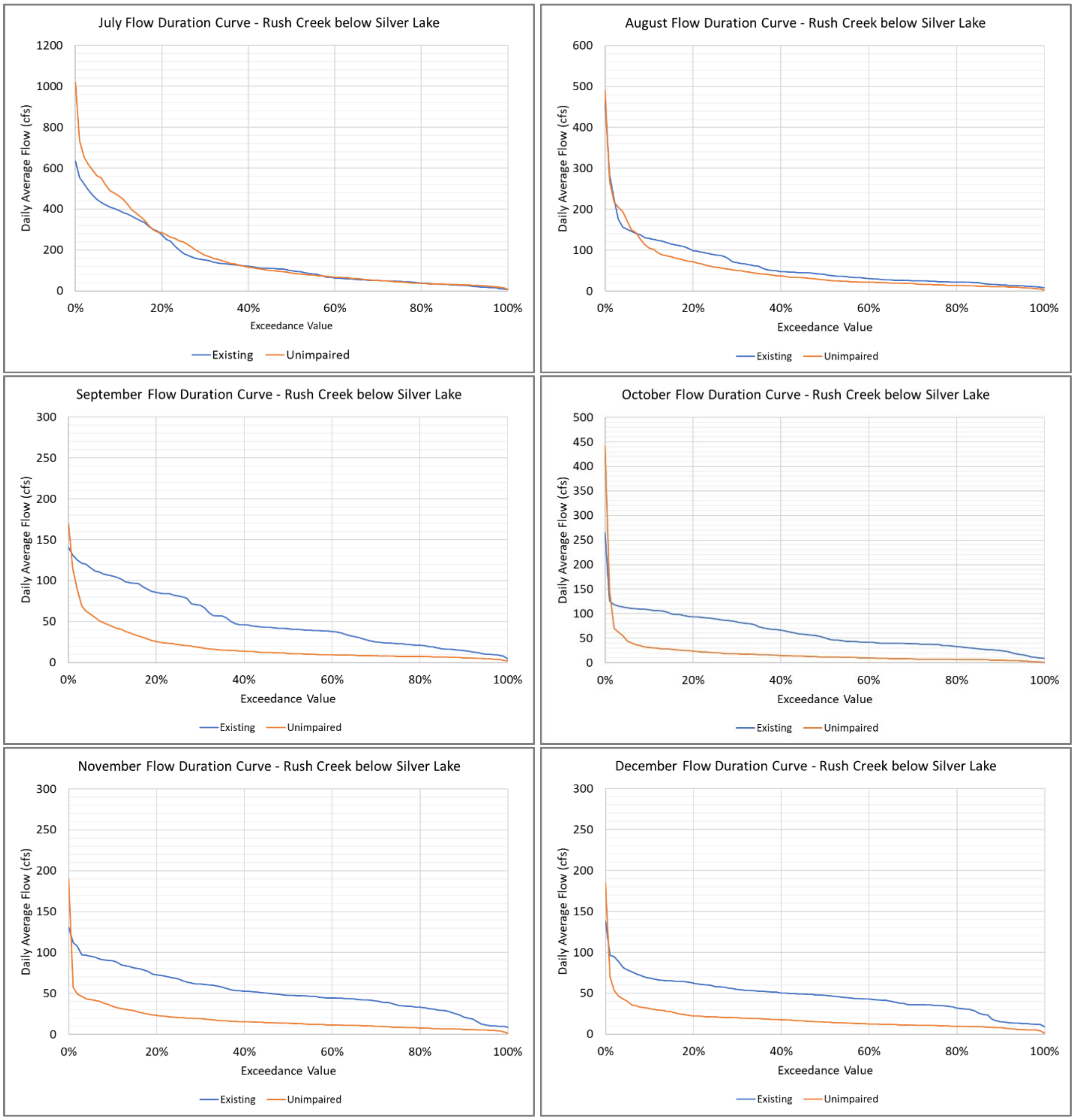



**Figure B-4. Monthly Flow Duration Curves for Rush Creek Below Silver Lake, Existing and Unimpaired Flows (July–December)**

## TABLE OF CONTENTS

Page

8.3 Water Quality ........ 8.3-1
8.3.1 Information Sources ........ 8.3-1
8.3.2 Water Quality Standards ........ 8.3-2
8.3.3 Basin Overview ........ 8.3-2
8.3.4 Historical Water Quality Information ........ 8.3-3
8.3.5 Recent Water Quality Data Collected during Relicensing Studies ........ 8.3-5
8.3.6 References ........ 8.3-8

## LIST OF TABLES

Table 8.3-1. Summary of Water Quality Analytical Tests, Including Laboratory Methods and Reporting Limits, and Chemical Water Quality Objectives ........ 8.3-11

Table 8.3-2. Water Quality Sampling Locations ........ 8.3-13

Table 8.3-3. Summary of In-Situ Stream Measurements Collected during the Spring 2023 Sampling Event ........ 8.3-14

Table 8.3-4. Summary of In-Situ Stream Measurements Collected during the Fall 2023 Sampling Event ........ 8.3-15

Table 8.3-5. Summary of Seasonal Grab Sample Results Collected during the Spring 2023 Sampling Event ........ 8.3-16

Table 8.3-6. Summary of Seasonal Grab Sample Results Collected during the Fall 2023 Sampling Event ........ 8.3-17

Table 8.3-7. Calculated Ammonia Concentration Criteria for the 2023 Spring and Fall Sampling Events ........ 8.3-18

Table 8.3-8. Summary of Analytical Results for Bacterial Sampling at Agnew and Gem Lakes in July 2023 ........ 8.3-20

## LIST OF FIGURES

Figure 8.3-1. Gem Lake (GL-1; Mid-Lake) Profiles for Water Temperature, DO, pH, and Specific Conductance from July through October 2023 ........ 8.3-22

Figure 8.3-2 Gem Lake (GL-2; Near Dam) Profiles for Water Temperature, DO, pH, and Specific Conductance from July through October 2023 ........ 8.3-23

Figure 8.3-3. Agnew Lake Profiles for Water Temperature, DO, pH, and Specific Conductance from July through October 2023 ........ 8.3-24

Figure 8.3-4. Silver Lake (SL-1; Mid-Lake) Profiles for Water Temperature, DO, pH, and Specific Conductance from June through October 2023 ........ 8.3-25

Figure 8.3-5. Silver Lake (SL-2; Near Outlet) Profiles for Water Temperature, DO, pH, and Specific Conductance from June through October 2023 ........ 8.3-26

Figure 8.3-6. Gem, Agnew, and Silver Lake Profile Sampling Locations ........ 8.3-27

## LIST OF MAPS

Map 8.3-1. Water Temperature and Water Quality Sampling Locations ........ 8.3-29

## LIST OF APPENDICES

Appendix 8.3-A Summary of Historical Water Quality Data

## LIST OF ACRONYMS

| | |
|---|---|
| °C | degrees Celsius |
| µS/cm | microSiemens per centimeter |
| Basin Plan | Water Quality Control Plan for the Lahontan Region |
| CEDEN | California Environmental Data Exchange Network |
| CRWQCB | California Regional Water Quality Control Board |
| CTR | California Toxics Rule |
| EA | Environmental Assessment |
| EIR | Environmental Impact Report |
| EPA | Environmental Protection Agency |
| FERC | Federal Energy Regulatory Commission |
| Forest Service | United States Forest Service |
| FR | Federal Register |
| INF | Inyo National Forest |
| LADWP | Los Angeles Department of Water and Power |
| mg/L | milligrams per liter |
| mL | milliliter |
| MPN | most probable number of bacterial colonies |
| NTR | National Toxics Rule |
| NTU | Nephelometric Turbidity Unit |
| PAD | Pre-Application Document |
| Project | Rush Creek Project |
| RWQCB | Regional Water Quality Control Board |
| SCE | Southern California Edison Company |
| SWRCB | State Water Resources Control Board |
| TDS | total dissolved solids |
| TSR | Technical Study Report |
| USGS | United States Geological Survey |

## 8.3 WATER QUALITY

This section describes water quality in Rush Creek, as it relates to Southern California Edison Company's (SCE) Rush Creek Project (Project). It includes an overview of applicable water quality standards and objectives, historical water quality data in the vicinity of the Project, and recent water quality data collected as part of the Project relicensing technical studies (AQ 4 – Water Quality Technical Study Report [TSR]; SCE 2024).

The Federal Energy Regulatory Commission (FERC) regulations require information on both water quantity (water use and hydrology) and water quality for waters affected by the Project. This section presents information on water quality. Information on water quantity is addressed in Section 8.2, Water Use and Hydrology.

### 8.3.1 Information Sources

This section was prepared utilizing the following information sources:

- Water quality standards
  - California Toxics Rule (CTR) "Water Quality Standards: Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California" (Federal Register, 65 FR 31682, EPA 2000);
  - National Toxics Rule (NTR) Water Quality Standards: Establishment of Numeric Criteria for Priority Toxic Pollutants" (Federal Register [FR], 57 60848, EPA 1992); and
  - Water Quality Control Plan for the Lahontan Region (Basin Plan; California Regional Water Quality Control Board [CRWQCB] 2021);
  - Environmental Protection Agency (EPA) national water quality criteria (65 FR 31682, EPA 2000); and
  - Bacteria Water Quality Objectives Basin Plan Amendment (CRWQCB 2023).
- Historical study reports and published data
  - The United States Geological Survey's (USGS) National Water Information System and the California Environmental Data Exchange Network (CEDEN) online databases provided water quality information;
  - Draft Environmental Impact Report (EIR) for the Review of Mono Basin Water Rights of the City of Los Angeles (SWRCB 1993);

  - Environmental Assessment (EA) for Hydropower License, Rush Creek FERC Project No. 1389-001, California (FERC 1992); and

  - Effects of Flow, Reservoir Storage, and Water Temperatures on Trout in Lower Rush and Lee Vining Creeks, Mono County, California (Shepard et al. 2009).

- Recent Reports and data

  - Pre-Application Document (PAD) for the Project (SCE 2021). The PAD includes a general description of water quality conditions within the vicinity of the Project, including historical water quality information.

  - Draft AQ 4 – Water Quality Technical Study Report (SCE 2024) (AQ 4 – TSR)

### 8.3.2 Water Quality Standards

The State of California has responsibility for maintaining water quality standards through implementation of the Federal Clean Water Act. The Regional Water Quality Control Board (RWQCB) has established water quality objectives for specific beneficial water uses in the Water Quality Control Plan for the Lahontan Region (Basin Plan). The water quality objectives include both numeric and narrative standards for surface water that are based on criteria that protect both human health and aquatic life. If water quality is maintained at levels consistent with these objectives, beneficial uses are considered to be protected. Applicable water quality objectives and standards in the Basin Plan are provided in Table 8.3-1.

The Basin Plan numeric water quality objectives are derived from various sources. These objectives include references to maximum contaminant levels that are provided in Title 22 of the California Code of Regulations which sets standards for waters designated for domestic or municipal use. Additional, and often more stringent criteria are provided by the CTR “Water Quality Standards: Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California” (Federal Register, 65 FR 31682, EPA 2000) and the NTR “Water Quality Standards: Establishment of Numeric Criteria for Priority Toxic Pollutants” (Federal Register, 57 FR 60848, EPA 1992) to protect aquatic life, and human health. The pertinent CTR and NTR toxicity standards are provided in Table 8.3-1

### 8.3.3 Basin Overview

The Rush Creek Basin has very limited development and private land. The primary residential / commercial development is in the June Lake Village area within the Reversed Creek sub-basin and in the Silver Lake area. The majority of the Basin is composed of federal lands within the Inyo National Forest (INF), which is under the jurisdiction of the United States Forest Service (Forest Service). A portion of the Rush Creek Project, the Rush Creek Powerhouse, is located on a parcel of SCE-owned lands. Waugh and Gem lakes are located within the Ansel Adams Wilderness; Agnew Lake is located on INF land (see Section 8.1, River Basin). Recreation of various types (camping, hiking, fishing, and skiing) is a primary land use in the Basin. Because of the limited development in the Basin and the nature of the Rush Creek Project (high mountain storage reservoirs and hydropower generation), water quality is good and there is limited potential for water quality issues.

Sources of water pollution such as stormwater runoff or wastewater treatment are limited. The June Lake Public Utility District provides wastewater treatment for most of the commercial and residential development in the Basin (e.g., June Lake Village, Down-Canyon between the village and Silver Lake, and the Forest Service Silver Lake Tract). In addition, service is provided on a contract basis to Forest Service Campgrounds, several parking facilities, and Grant Lake Marina. All wastewater flows to the main trunkline along State Route 158 and then to the wastewater treatment plant below Grant Lake adjacent to U.S. Highway 395. The wastewater is treated in evaporation ponds and no wastewater returns to Rush Creek.

### 8.3.4 Historical Water Quality Information

#### 8.3.4.1 Water Quality

Water quality data measured in the vicinity of the Project and made available by the USGS and the CEDEN are provided in Appendix 8.3-A. Historic water quality sampling locations, identified by agencies, are shown on Map 8.3-A1.

Water quality sampling was performed by the USGS in 1994 at three locations on Rush Creek, one location on Reversed Creek, and three locations in Silver Lake. This sampling included measurements of discharge, pH, specific conductance, dissolved oxygen, hardness, dissolved solids, ammonia, nitrates, nitrites, orthophosphate, phosphorus, and a number of other general water quality parameters. Temperature, pH, dissolved oxygen, and specific conductance profiles were measured at 1-meter increments at each of the three Silver Lake locations in 1994 (Tables 8.3-A1 through 8.3-A5 and Figures 8.3-A1 through 8.3-A3).

Additional water quality sampling was performed as part of the Surface Water Ambient Monitoring Program Perennial Stream Surveys in 2000, 2001, 2010, and 2011 at three locations on Rush Creek. The water quality parameters measured in these studies included most of the same parameters that were listed for the USGS water quality monitoring (Table 8.3-A6).

*Escherichia coli* (*E. coli*) and fecal coliform sampling was conducted as part of the Eastern Sierra Ambient Monitoring at three locations on Rush Creek in 2012 and 2013 (Table 8.3-A7).

The Rush Creek EA (FERC 1992) reported water quality data measured in Waugh, Gem, and Agnew lakes between July 1986 and August 1987. Ranges of measured temperature, pH, dissolved oxygen, electrical conductivity, calcium, bicarbonate for each site are provided in Table 8.3-A8. Original measurements are provided in Tables 8.3-A9 through Table 8.3-A21 (Lund 1988).

Additional historical water quality data was reported for the Grant Lake Reservoir Outlet in the Mono Basin EIR that was assembled for the Mono Basin Water Rights Hearings before the California State Water Resources Control Board (SWRCB 1993). The EIR reported the mean, minimum, and maximum of all data sampled by the Los Angeles Department of Water and Power (LADWP) from 1940 to 1990 and data recorded in 1991 by Jones & Stokes Associates (Table 8.3-A22).

### 8.3.4.2 Water Temperature

Water temperature grab samples were available for the USGS, CEDEN, and Rush Creek EA water quality samples for Rush Creek, Reversed Creek, Silver Lake, Waugh Lake, Gem Lake, and Agnew Lake (Table 8.3-A1 through Table 8.3-A6, Table 8.3-A8).

Continuous water temperature data were collected at four locations on Rush Creek downstream of Grant Lake between October 1999 and October 2008 (Map 8.3-A2). These sites were monitored to support a total maximum daily loads study to determine whether or not Rush Creek should be placed on the section 303(d) list for water temperature (Shepard et al. 2009). The daily average temperature for each of these sites is plotted in Figure 8.3-A4.

### 8.3.4.3 Summary

**Water Quality**

Historical information sources indicate that the physical and water chemistry conditions in the streams and lakes/reservoirs associated with the Project are of high quality and conform to regulatory water quality objectives and standards. No persistent, widespread water quality issues were found. There is no agriculture or water treatment plants that discharge into Rush Creek. Physical and water chemistry conditions in Rush Creek upstream and downstream of the Project is of high quality.

A review of the water quality data from sample locations on Rush Creek and Reversed Creek indicates that, in general, all of the constituents analyzed have complied with regulatory standards, with the exception of dissolved oxygen (Table 8.3-A1). Dissolved oxygen dropped below 8 milligrams per liter (mg/L) in July and September of 1994 at all the measurement locations along Rush Creek and Reversed Creek. These lower dissolved oxygen measurements reflect the reduced capacity of water to naturally carry oxygen at higher temperatures and elevations, rather than a specific water quality concern. The percent saturation of oxygen remained within a range of 90 percent to 102 percent for all samples, including those that dropped below the 8 mg/L standard.

Water quality samples in Silver Lake downstream of the Rush Creek Powerhouse also generally complied with regulatory standards, based on data collected by the USGS, with three exceptions. An elevated orthophosphate reading on July 28, 1994, was likely an error since all other measurements on that date and in all of Silver Lake showed orthophosphate levels to be below the detection limit. Water quality data profiles collected on July 28, 1994, at Site 1 also showed pH levels that dropped just slightly below the lower limit of 6.5. A pH of 6.4 was recorded for one site at two locations in the water column. The dissolved oxygen profiles collected in Silver Lake during the summer/fall period also showed values of less than 8 mg/L (Table 8.3-A2 through Table 8.3-A5). Silver Lake became thermally stratified by June or earlier and as is typical in stratified systems, little mixing occurs between the epilimnion and hypolimnion (Figure 8.3-A1). This results in naturally reduced oxygen levels in the hypolimnion. Oxygen levels in the epilimnion, although below 8 mg/L, are at or close to full saturation (Table 8.3-A2).

Water quality samples in Waugh, Gem, and Agnew lakes were also generally of high quality (Table 8.3-A8). High measurements of electrical conductivity, calcium, and bicarbonate occurred during August 1987; however, no specific details were available to further diagnose the cause of the high measurements. Low dissolved oxygen measurements occurred deep in the water column, likely due to reduced mixing in the hypolimnion.

**Water Temperature**

Typically, water temperatures below 20 degrees Celsius (°C) are suitable for cold water salmonid fishes (example rainbow trout, brown trout). Historical water temperature grab samples from the USGS, CEDEN, and Rush Creek EA indicated that Rush Creek and the Project reservoirs (Waugh, Gem, and Agnew) all have water temperatures suitable for cold water salmonids.

In the farthest downstream portion of Rush Creek, approximately 6 percent of the continuous water temperature measured at four locations downstream of Grant Lake (525 of 8,822 samples) exceeded the temperature objective for the water body (13°C – 21°C based on Moyle [1976]). Since this did not exceed the allowable frequency listed in Table 3.2 of the Listing Policy (SWRCB 2004), it was determined by RWQCB staff that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

### 8.3.5 Recent Water Quality Data Collected during Relicensing Studies

As part of AQ 4 – TSR (SCE 2024), a comprehensive water quality monitoring program was implemented for the Project in 2023. Seasonal *in-situ* stream measurements and water quality grab sampling was performed on Rush Creek, Reversed Creek, in Project reservoirs (Gem Lake and Agnew Lake), and in Silver Lake in the spring and fall (Table 8.3-2). Seventeen parameters were measured, including a suite of *in-situ* field measurements and general parameters. Sampling timing was designed to capture spring runoff (June/July) and late summer/early fall base-flow period (September/October). Reservoir profiles were also completed on Gem Lake, Agnew Lake, and Silver Lake monthly from June to October 2023 (as access permitted). Six parameters were measured during profile sampling. In addition, total coliform, fecal coliform, and *E. coli* sampling was conducted in Gem and Agnew Lakes in accessible locations near the dams. Results of the sampling efforts are summarized below. A detailed description of the study methods and results are available in AQ 4 – TSR included in SD A (SCE 2024).

### 8.3.5.1 Seasonal *In-Situ* Field Measurements

*In-situ* stream measurements included water temperature, dissolved oxygen, turbidity, conductivity, pH, and salinity. All six of these parameters met the applicable water quality standards at all sampling locations (Table 8.3-3 and Table 8.3-4). Alkalinity was also measured at the i*n-situ* sampling locations using grab samples analyzed by WETLAB (a water quality laboratory located in Sparks, Nevada). Alkalinity was generally low in the Project sampling area, typically below the NTR criteria of 20 mg/L, however this is typical of granitic / volcanic watersheds (Hem 1989; Miller 2002) and the criterion does not apply to situations where alkalinity is naturally low, which is the case in the Project area.

### 8.3.5.2 Seasonal Water Quality Grab Samples

Results of the general water quality grab sampling are presented in Table 8.3-5 and Table 8.3-6. Table 8.3-7 contains the calculated criteria and results for ammonia, which has criteria based on temperature and pH and therefore must be calculated on a location-by-location basis. General water quality samples for nitrite/nitrate, ammonia, total nitrogen, total phosphorus, orthophosphate, and total suspended solids were all low or not detected in both spring and fall sampling. Water quality samples for ammonia were not detected.

Alkalinity was naturally low in the Rush Creek Watershed as discussed above in Section 8.3.4.1. Twenty-seven of the 40 total samples were below the NTR alkalinity criterion ≥20 mg/L. Total dissolved solids (TDS) were high compared to the Basin Plan standard at a few sites (Rush Creek above Silver Lake / within Silver Lake). The observed high TDS in Silver Lake (and inflow) appears to be the result of high TDS in Reversed Creek (84 mg/L and 95 mg/L, spring and fall, respectively). For example, the Reversed Creek values are not above the 100 mg/L criteria for Reversed Creek but Reversed Creek inflow into Silver Lake increases the TDS in Silver Lake above the 45 mg/L criteria for Silver Lake. Higher TDS in Reversed Creek is likely naturally occurring because much of the lower Reversed Creek Watershed (Gull Lake and below) includes marine sedimentary geology (Green et al. 1997; SCE 2021), which weathers and increases TDS, alkalinity, and conductivity.

### 8.3.5.3 Reservoir Profiles

Reservoir profiles showing water temperature, dissolved oxygen, conductivity, salinity, and pH for Gem, Agnew, and Silver lakes are shown in Figures 8.3-1 through 8.3-5. Turbidity profiles recorded at all sampling locations were negligible (<1 Nephelometric Turbidity Unit (NTU)) and therefore were not plotted. Figure 8.3-6 shows the reservoir profile locations. Profiles were collected monthly July to October in Gem and Agnew lakes and June to October 2023 in Silver Lake. Secchi depths were also collected. Gem Lake was deepest, followed by Agnew Lake, and then Silver Lake. Water clarity was high in all of the lakes.

Water temperature in the lakes was cold, approximately <15°C (including at the surface epilimnions). Hypolimnions were much colder, typically <10°C or colder when they were present. Gem Lake was stratified in all sampling months (July to October). Agnew Lake was stratified July to September, but destratified in October. Silver Lake was only strongly stratified in August. In other months, Silver Lake was weakly stratified or not stratified at all. The near outlet site (SL-2) of Silver Lake was shallow and not indicative of potential stratification in the reservoir.

Dissolved oxygen in the reservoirs was >8 mg/L in all profiles except in the lower portion of the hypolimnion of Agnew and Silver lakes in August and September, where there was a slight reduction in dissolved oxygen, 5–6 mg/L. The hypolimnetic reduction in dissolved oxygen likely was the result of microbial respiration.

pH was typically low in the lakes but above the 6.5 pH minimum Basin Plan criteria except in the lower portion of the hypolimnions where carbon dioxide can accumulate due to microbial respiration and reduce pH.

Specific conductivity (a measure of salinity) was uniquely distributed in the lakes. Gem Lake conductivity was generally low in the epilimnion, while Agnew Lake had higher conductivity (76+ microSiemens per centimeter [μS/cm]). Silver Lake conductivity is primarily determined by a mix of inflow water. High conductivity inflows from Reversed Creek (e.g., 80 μS/cm) and lower conductivity releases from the portion of Gem Lake (via the Rush Creek Powerhouse) that has lower conductivity. There are no conductivity criteria in the Basin Plan.

#### 8.3.5.4 Bacterial Sampling

The results of the coliform analysis are presented in Table 8.3-8. Five water samples at both Gem and Agnew were collected in the month of July. A new Basin Plan water quality objective for bacteria was recently proposed by the Lahontan Region Water Quality Control Board (June 2023) and adopted by the State Water Resources Control Board (January 2024). The new criteria removed fecal coliform as the recreational contact objective and replaced it with *E. coli* as the recreational contact water quality objective (CRWQCB 2023). *E. coli* was either non-detect and/or ≤1 most probable number of bacterial colonies (MPN)/100 milliliter (mL). The *E. coli* concentrations were well below the 100 colony forming units / 100 mL (or 100 MPN/100 mL) specified in the updated Basin Plan criteria. There were some samples with high total and fecal coliform numbers (potentially wildlife, horses, or other sources of fecal coliform), but it is *E. coli* that has been determined to be correlated to swimming-associated gastroenteritis (EPA 2012). There are no contact recreation criteria for total coliform because much of total coliform can be from natural sources.

### 8.3.6 References

CEDEN (California Environmental Data Exchange Network). Online Database. Available at: https://ceden.org/.

CRWQCB (California Regional Water Quality Control Board) Lahontan Region. 2021. Water Quality Control Plan for the Lahontan Region, North and South Basins (Basin Plan). Revised September 2021. Available at: https://www.waterboards.ca.gov/lahontan/water_issues/programs/basin_plan/references.html.

———. 2023. Adoption of Amendment to the Water Quality Control Plan for the Lahontan Region to Remove the Regionwide Bacteria Water Quality Objectives and Insert Discussion of the Rec-1 Bacteria Provisions. California Regional Water Quality Control Board Lahontan Region Resolution No. R6T-2023-0025. Available at: https://www.waterboards.ca.gov/rwqcb6/board_decisions/adopted_orders/2023/docs/r6t-2023-0025-bacteria-resolution.pdf.

EPA (Environmental Protection Agency). 1992. National Toxics Rule (NTR) Water Quality Standards: Establishment of Numeric Criteria for Priority Toxic Pollutants". Federal Register, 57 FR 60848.

———.2000. California Toxics Rule (CTR) "Water Quality Standards: Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California". Federal Register, 65 FR 31682.

———. 2012. Recreational Water Quality Criteria for Bacterial Indicators of Fecal Contamination. Office of Water 820-F-12-058.

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

Green, D.C., R. Schweickert, and C.H. Stevens. 1997. Roberts Mountains allochthon and the western margin of the Cordilleran miogeocline in the Northern Ritter Range pendant, eastern Sierra Nevada, California. *Geological Society of America Bulletin* 109(10):1294–1305.

Hem, J.D. 1989. Study and Interpretation of the Chemical Characteristics of Natural Water. Third Edition. U.S. Geological Survey Water-Supply Paper 2254.

Lund, L. 1988. Water quality of Bishop Creek and selected eastern Sierra Nevada lakes. Report of Research for 1986 to 1988. SCE. 110 pp.

Miller, R. 2002. Influence of Rock Composition on the Geochemistry of Stream and Spring Waters from Mountainous Watersheds in the Gunnison, Uncompahgre, and Grand Mesa National Forests, Colorado. U.S. Geological Survey Professional Paper 1667.

Moyle, P.B. 1976. Inland fishes of California. University of California Press, Berkeley. 405 pp.

SCE (Southern California Edison Company). 2021. Pre-Application Document for the Rush Creek Project. December 2021.

———. 2024. Draft AQ 4 – Water Quality Technical Study Report. August. Available in Supporting Document A of the Application for New License.

Shepard, B., Taylor R., Knudson K., Hunter C. 2009. Effects of Flow, Reservoir Storage, and Water Temperatures on Trout in Lower Rush and Lee Vining Creeks, Mono County, California. Available at: https://www.waterboards.ca.gov/waterrights/water_issues/programs/mono_lake/docs/effectstrout2009may.pdf.

SWRCB (State Water Resources Control Board. 1993. Draft Environmental Impact Report for the Review of Mono Basin Water Rights of the City of Los Angeles. Available at: https://www.monobasinresearch.org/onlinereports/mbeir.php.

———. 2004. Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List, Amended 2015. Available at: https://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/2015/020315_8_amendment_clean_version.pdf.

USGS (United States Geological Survey). National Water Information System Online Database. Available at: https://waterdata.usgs.gov/nwis.

# TABLES

**Table 8.3-1. Summary of Water Quality Analytical Tests, Including Laboratory Methods and Reporting Limits, and Chemical Water Quality Objectives**

| Analyte | Units | Analysis Method[1] | Reporting Limit (RL) | Water Quality Criteria | | | Sample Container | Hold Time | Preservative/ Comment |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Basin Plan[2] | CA Toxics Rule (CTR)[3] | National Toxics Rule (NTR)[4] | | | |
| **In-Situ/Profile Measurements** | | | | | | | | | |
| Water Temperature | Celsius (°C) | Water Quality Meter | NA | No Change | NS | NS | NA | NA | None |
| Dissolved Oxygen (DO) | mg/L | Water Quality Meter | NA | 8.0 (5.0)[5] | NS | NS | NA | NA | None |
| Turbidity | NTU | Water Quality Meter | NA | Var[6] | Narr[7] | NS | NA | NA | None |
| Conductivity | µS/cm at 25°C | Water Quality Meter | NA | NS | NS | NS | NA | NA | None |
| pH | unitless | Water Quality Meter | NA | Change < 0.5 | NS | 6.5 – 9.0 | NA | NA | None |
| Salinity | ppt | Calculated | NA | NS | NS | NS | NA | NA | None |
| Seechi Depth | feet | Secchi Disk | NA | NS | NS | NS | NA | NA | None |
| **General Parameters** | | | | | | | | | |
| Nitrate/Nitrite ($NO_3$) | mg/L | EPA 353.2 | 0.020 | See Table AQ 4-5[8] | NS | NS | 500mL plastic | 48 hours | $H_2SO_4$, maintain at ≤6°C |
| Ammonia as N | mg/L | Timberline Ammonia-001 | 0.10 | See Table AQ 4-4 | NS | Depends on pH & temperature | 500mL plastic | 28 days | $H_2SO_4$, maintain at ≤6°C |
| Total Kjeldahl Nitrogen (TKN) | mg/L | EPA 351.2 | 0.20 | See Table AQ 4-5[8] | NS | NS | 500mL plastic | 28 days | $H_2SO_4$, maintain at ≤6°C |
| Total Phosphorus | µg/L | SM 4500-P E | 0.020 | NS | NS | NS | 500mL plastic | 28 days | $H_2SO_4$, maintain at ≤6°C |
| Orthophosphate | mg/L | SM 4500-P E | 0.020 | See Table AQ 4-5[8] | NS | NS | 1000mL plastic | 48 hours | Maintain at ≤6°C |
| Total Dissolved Solids | mg/L | SM 2540C | 25.0 | See Table AQ 4-5[8] | NS | NS | 1000mL plastic | 7 days | Maintain at ≤6°C |
| Total Suspended Solids | mg/L | SM 2540D | 10.0 | NS | NS | NS | 1000mL plastic | 7 days | Maintain at ≤6°C |
| Total Alkalinity (as CaCO3) | mg/L | SM 2320B | 1.0 | NS | NS | >20[10, 11] | 1000mL plastic | 14 days | Maintain at ≤6°C |
| Nitrate Nitrogen[9] | mg/L | EPA 300.0 | 0.030 | See Table AQ 4-5[8] | NS | NS | 500mL plastic | 48 hours | $H_2SO_4$, maintain at ≤6°C |
| Nitrite Nitrogen[9] | mg/L | EPA 300.0 | 0.020 | NS | NS | NS | 500mL plastic | 48 hours | $H_2SO_4$, maintain at ≤6°C |

| Analyte | Units | Analysis Method[1] | Reporting Limit (RL) | Water Quality Criteria: Basin Plan[2] | Water Quality Criteria: CA Toxics Rule (CTR)[3] | Water Quality Criteria: National Toxics Rule (NTR)[4] | Sample Container | Hold Time | Preservative/ Comment |
|---|---|---|---|---|---|---|---|---|---|
| **Bacteria** | | | | | | | | | |
| Total Coliform | MPN/100 mL | SM 9223B | 1.0[12] | NS | NS | NS | 100 mL glass | 8 hours | Maintain at ≤6°C |
| Fecal Coliform | MPN/100 mL | IDEXX Quant/Colilert | 1.0[12] | 20/100[13] | NS | NS | 100 mL glass | 8 hours | Maintain at ≤6°C |
| *E. coli*[14] | MPN/100 mL | SM 9223B | 1.0 | NS | NS | 126[14] | 100 mL glass | 8 hours | Maintain at ≤6°C |

1 Analysis methods are periodically updated by the EPA. The most recent methods available were used for the water quality analysis. Methods used were dictated by the state-certified laboratory.

2 1995 Water Quality Control Plan for the Lahontan Region (Basin Plan) [with amendments through September 22, 2021] provides narrative and numerical water quality objectives which define the upper concentration or other limits that the Regional Board considers protective of beneficial uses (CRWQCB 2021).

3 California Toxics Rule (CTR) criteria are based primarily on EPA standards developed under the Clean Water Act for human consumption of water and aquatic organisms with an adult risk for carcinogens estimated to be one in one million as contained in the Integrated Risk Information System (IRIS) as of October 1, 1996.

4 The National Toxics Rules are based on USEPA standards developed under the Clean Water Act for human consumption of water and aquatic organisms with an adult risk for carcinogens estimated to be one in one million as contained in the IRIS as of October 1, 1996. These criteria are to be applied to all states not complying with the Clean Water Act section 303(c)(2)(B).

5 For water designated as COLD or SPWN 1 Day Minimum: 8.0 (5.0) and 7 Day Mean: 9.5 (6.5). Note: These are water column concentrations recommended to achieve the required intergrade dissolved oxygen concentrations shown in parentheses. For species that have early life stages exposed directly to the water column (SPWN), the figures in parentheses apply. (Table 3.6 Water Quality Control Plan for the Lahontan Region (Basin Plan) Chapter III: Water Quality Objectives, pg. 3-24 September 22, 2021).

6 Waters shall be free of changes in turbidity that cause nuisance or adversely affect the water for beneficial uses. Increases in turbidity shall not exceed natural levels by more than 10 percent.

7 Increases in turbidity attributable to controllable water quality factors shall not exceed the following limits: where natural turbidity is between 0 and 5 NTU's, increases shall not exceed 1 NTU. Where natural turbidity is between 5 and 50 NTU's, increases shall not exceed 20 percent. Where natural turbidity is between 50 and 100 NTU's, increases shall not exceed 10 NTU's. Finally, where natural turbidity is greater than 100 NTU's, increases shall not exceed 10 percent.

8 Where available data were sufficient to define existing ambient levels of constituents, these levels were used in developing the numerical objectives for specific water bodies. By utilizing annual mean, 90th percentile values and flow-weighted values, the objectives are intended to be realistic within the variable conditions imposed by nature. (Water Quality Control Plan for the Lahontan Region (Basin Plan) Chapter III: Water Quality Objectives, pg. 3-2 September 22, 2021).

9 Due to WETLAB instrumentation maintenance issues, testing as NO3 was not possible for grab samples collected during the late summer/early fall base flow period. Instead, samples were run using EPA 300.0 and flagged to bring the RL down. Values reported should be considered estimates per the lab.

10 The CCC of 20 mg/L is a minimum value except where alkalinity is naturally lower, in which case the criterion cannot be lower than 25 percent of the natural level.

11 Alkalinity measurements were not collected during in-situ field measurements; however, they were collected as part of the spring runoff and late summer/early fall base flow, water quality grab sample periods.

12 When samples are heavily diluted by the lab, analysts may dilute the sample to read the test results properly. This dilution will increase the reporting limit. Some tests were run with an increased RL identified in this TSR.

13 The fecal coliform concentration during any 30-day period shall not exceed a log mean of 20/100 ml, nor shall more than 10 percent of all samples collected during any 30-day period exceed 40/100 ml. The log mean shall ideally be based on a minimum of not less than five samples collected as evenly spaced as practicable during any 30-day period. However, a log mean concentration exceeding 20/100 ml for any 30-day period shall indicate violation of this objective even if fewer than five samples were collected. (Water Quality Control Plan for the Lahontan Region (Basin Plan) Chapter III: Water Quality Objectives, pg. 3-6 September 22, 2021).

14 *E. coli* was not a water quality parameter identified in the AQ-4 Technical Study Plan; however, testing was performed by the state-certified laboratory and results are included in this TSR voluntarily. Lab reporting only identified presence/absence.

Key:
MDL = method detection limit (the minimum measured concentration of a substance that can be reported with 99 percent confidence that the measured concentration is distinguishable from method blank results)
MPN = most probable number of bacterial colonies per 100 mL of water
MRL = method reporting limit (the lowest concentration of a substance that can be reliably reported under current laboratory operating conditions)
NA= Not Applicable
NS = no standard available

**Table 8.3-2. Water Quality Sampling Locations**

| Stream Segment Name | Segment Length (miles) / River Miles (RM) | Sampling Location River Mile / Site ID | Number of Sampling Locations | In-situ Field Measurements | Water Quality Grab Samples | Reservoir / Lake Profiles |
|---|---|---|---|---|---|---|
| **Rush Creek** | | | | | | |
| Waugh Lake[1] | 1.51 (RM 22.24–23.75) | RM 23.0 / RC23.0 | 1 | X | X | — |
| Rush Creek Below Rush Meadows Dam | 1.83 (RM 20.41–22.24) | RM 21.65 / RC21.65 | 1 | X | X | — |
| Gem Lake[2] | 0.93 (RM 19.48–20.41) | GL-1 (mid-lake) /GL-2 (near the dam) | 2 | — | X | X |
| Rush Creek Below Gem Dam | 0.30 (RM 19.18–19.48) | RM 19.25 / RC19.25 | 1 | X | X | — |
| Agnew Lake | 0.58 (RM 18.60–19.18) | AL-1 (mid-lake) | 1 | — | X | X |
| Rush Creek Below Agnew Dam | 0.40 (RM 18.2–18.60) | RM 18.55 / RC18.55 | 1 | X | X | — |
| Rush Creek Horsetail Falls | 0.54 (RM 17.66–18.2) | — | — | — | — | — |
| Rush Creek Powerhouse Tailrace | — | PHTR | 1 | X | X | — |
| Rush Creek Above Silver Lake | 0.94 (RM 16.72–17.66) | RM 17.15 / RC17.15<br>RM 17.6 / RC17.6 | 2 | X | X | — |
| Silver Lake | 0.83 (RM 15.89–16.72) | SL-1 (mid-lake) / SL-2 (near outlet) | 2 | X | X | X |
| Rush Creek Below Silver Lake | 2.69 (RM 13.20–15.89) | RM 15.2 / RC15.2 | 1 | X | X | — |
| **South Rush Creek** | | | | | | |
| South Rush Creek | 0.46 (RM 0.0–0.46) | RM 0.15 / SRC0.15 | 1 | X | X | — |
| **Reversed Creek** | | | | | | |
| Reversed Creek | — | 100–200 feet upstream of the confluence with South Rush Creek / RVC0.26 | 1 | X | X | — |

1. The low-level outlet at Rush Meadows Dam remains open such that little/no water is currently impounded in Waugh Lake. Rush Creek essentially flows unimpeded through the historic lakebed. Therefore, Waugh Lake is treated as a stream segment for water quality sampling.
2. Water quality sampling in Gem Lake is contingent on obtaining any required Forest Service authorization for use of a motorized boat.

Key: RM = River Mile

## Table 8.3-3. Summary of In-Situ Stream Measurements Collected during the Spring 2023 Sampling Event

| Sampling Location / Site ID | Stream Segment Name | Date | Time of Day | Temperature (°C) | Dissolved Oxygen (mg/L) | Specific Conductance (µS/cm at 25 °C) | pH | Alkalinity[1] (mg/L) | Turbidity[2] (NTU) | Salinity[3] (ppt) |
|---|---|---|---|---|---|---|---|---|---|---|
| **Rush Creek** | | | | | | | | | | |
| RC23.0 | Waugh Lake | 7/26/2023 | 0645 | 3.5 | 9.50 | 4.5 | 6.83 | 11.0 | <1.0 | 0.00131 |
| RC21.65 | Rush Creek Below Rush Meadows Dam | 7/26/2023 | 0700 | 7.7 | 8.90 | 4.6 | 6.60 | 10.0 | <1.0 | 0.00134 |
| RC19.25 | Rush Creek Below Gem Dam | 6/27/2023 | 1330 | 3.9 | 10.25 | 14.3 | 7.15 | 5.6 | <1.0 | 0.00459 |
| RC18.55 | Rush Creek Below Agnew Dam | 6/27/2023 | 1430 | 5.2 | 9.95 | 45.0 | 7.08 | 7.6 | <1.0 | 0.01599 |
| PHTR | Rush Creek Powerhouse Tailrace | 6/26/2023 | 1140 | 3.6 | 10.04 | 12.4 | 6.95 | 4.7 | <1.0 | 0.00393 |
| RC17.15 | Rush Creek Above Silver Lake | 6/26/2023 | 1208 | 5.7 | 9.59 | 22.0 | 7.10 | 8.9 | <1.0 | 0.00734 |
| RC17.6 | Rush Creek Above Silver Lake | 6/26/2023 | 1115 | 5.8 | 9.68 | 17.7 | 7.01 | 7.9 | <1.0 | 0.00579 |
| RC15.2 | Rush Creek Below Silver Lake | 6/26/2023 | 1235 | 6.8 | 9.36 | 29.9 | 6.94 | 12.0 | <1.0 | 0.01025 |
| **South Rush Creek** | | | | | | | | | | |
| SRC0.15 | South Rush Creek | 6/26/2023 | 1105 | 5.9 | 9.84 | 16.7 | 7.23 | 6.4 | <1.0 | 0.00544 |
| **Reversed Creek** | | | | | | | | | | |
| RVC0.26 | Reversed Creek (Upstream of Confluence with South Rush Creek) | 6/26/2023 | 1034 | 7.2 | 9.26 | 55.0 | 7.30 | 35.0 | <1.0 | 0.01989 |

[1] Alkalinity field test kits were not used. Alkalinity was measured during the Spring/Fall grab samplings by the laboratory

[2] Turbidity values of "<1.0" indicate that turbidity measurements were within the instruments margin of error of +/- 1.0 NTU.

[3] Salinity was calculated by converting conductivity measurements (Dohrman 2023).

**Table 8.3-4. Summary of In-Situ Stream Measurements Collected during the Fall 2023 Sampling Event**

| Sampling Location / Site ID | Stream Segment Name | Date | Time of Day | Temperature (°C) | Dissolved Oxygen (mg/L) | Specific Conductance (µS/cm at 25 °C) | pH | Alkalinity[1] (mg/L) | Turbidity[2] (NTU) | Salinity[3] (ppt) |
|---|---|---|---|---|---|---|---|---|---|---|
| **Rush Creek** | | | | | | | | | | |
| RC23.0 | Waugh Lake | 9/26/2023 | 1530 | 11.8 | 10.02 | 9.0 | 6.62 | 16.0 | <1.0 | 0.00278 |
| RC21.65 | Rush Creek Below Rush Meadows Dam | 9/26/2023 | 1730 | 11.8 | 10.30 | 9.0 | 6.57 | 2.5 | <1.0 | 0.00278 |
| RC19.25 | Rush Creek Below Gem Dam | 9/25/2023 | 1230 | 10.9 | 10.78 | 17.7 | 7.27 | 6.7 | <1.0 | 0.00579 |
| RC18.55 | Rush Creek Below Agnew Dam | 9/26/2023 | 1345 | 12.5 | 9.20 | 71.0 | 7.09 | 85.0 | <1.0 | 0.02626 |
| PHTR | Rush Creek Powerhouse Tailrace | 9/28/2023 | 0950 | 12.4 | 8.99 | 9.5 | 7.13 | 3.6 | <1.0 | 0.00294 |
| RC17.15 | Rush Creek Above Silver Lake | 9/28/2023 | 1005 | 9.0 | 9.31 | 76.2 | 6.77 | 36.0 | <1.0 | 0.02836 |
| RC17.6 | Rush Creek Above Silver Lake | 9/28/2023 | 0940 | 7.6 | 9.91 | 111.0 | 7.35 | 48.0 | <1.0 | 0.04269 |
| RC15.2 | Rush Creek Below Silver Lake | 9/28/2023 | 1050 | 12.2 | 8.82 | 53.4 | 7.02 | 21.0 | <1.0 | 0.01926 |
| **South Rush Creek** | | | | | | | | | | |
| SRC0.15[4] | South Rush Creek | 9/28/2023 | 0920 | 6.9 | 9.86 | 44.0 | 6.67 | 17.0 | <1.0 | 0.01560 |
| **Reversed Creek** | | | | | | | | | | |
| RVC0.26 | Reversed Creek (Upstream of Confluence with South Rush Creek) | 9/28/2023 | 1030 | 7.9 | 9.46 | 110.0 | 7.00 | 53.0 | <1.0 | 0.04227 |

[1] Alkalinity field test kits were not used. Alkalinity was measured during the Spring/Fall grab samplings by the laboratory

[2] Turbidity values of "<1.0" indicate that turbidity measurements were within the instruments margin of error of +/- 1.0 NTU.

[3] Salinity was calculated by converting conductivity measurements (Dohrman 2023).

[4] SRC0.15 was dry in September. Samples taken at culvert crossing and confluence with an unnamed creek. This unnamed creek was still flowing in September, contributing to Rush Creek.

## Table 8.3-5. Summary of Seasonal Grab Sample Results Collected during the Spring 2023 Sampling Event

| General Parameters | Units | Reporting Limit | WQ Criteria | Site ID, Stream Segment, Date, Time | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | **RC 23.0** | **RC 21.65** | **GL-1 (surface)** | **GL-1 (mid-Column)** | **GL-2 (surface)** | **GL-2 (mid-column)** | **RC 19.25** | **AL-1 (surface)** | **AL-1 (mid-column)** | **RC 18.55** | **PHTR** | **RC 17.15** | **RC 17.6** | **SL-1 (surface)** | **SL-1 (mid-column)** | **SL-2 (surface)** | **SL-2 (mid-column)** | **RC 15.2** | **SRC 0.15** | **RVC 0.26** |
| | | | | **Waugh Lake** | **Rush Creek Below Rush Meadows Dam** | **Mid-Lake** | **Mid-Lake** | **Near Gem Dam** | **Near Gem Dam** | **Rush Creek Below Gem Dam** | **Mid-Lake** | **Mid-Lake** | **Rush Creek Below Agnew Dam** | **Rush Creek Power-house Tailrace** | **Rush Creek Above Silver Lake** | **Rush Creek Above Silver Lake** | **Mid-Lake** | **Mid-Lake** | **Near Outlet** | **Near Outlet** | **Rush Creek Below Silver Lake** | **South Rush Creek** | **Reversed Creek** |
| | | | | **7/26** | **7/26** | **7/24** | **7/25** | **7/24** | **7/25** | **6/27** | **7/25** | **7/25** | **6/27** | **6/26** | **6/26** | **6/26** | **6/26** | **6/26** | **6/26** | **6/26** | **6/26** | **6/26** | **6/26** |
| | | | | **0545** | **0655** | **1430** | **0945** | **1415** | **1045** | **1345** | **1315** | **1330** | **1500** | **1135** | **1205** | **1115** | **1415** | **1430** | **1445** | **1455** | **1240** | **1105** | **1020** |
| Nitrate + Nitrite (NO2 + $NO_3$) | mg/L | 0.020 | 0.1 [See Table AQ-4-5[2, 3]] | 0.032 | ND | ND | ND | ND[M] | ND | 0.042 | ND | ND | 0.038 | 0.038 | 0.033 | 0.035 | 0.025 | 0.028 | 0.023 | 0.022 | 0.026 | 0.035 | ND |
| Ammonia as N | mg/L | 0.10 | Varies See Table AQ 4-4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Total Kjeldahl Nitrogen (TKN) | mg/L | 0.20 | 0.1 - 0.2 [See Table AQ-4-5[2, 3]] | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | **0.29** | ND | ND | ND | ND | ND | ND[M] |
| Total Phosphorus | mg/L | 0.020 | NS | ND | ND | ND | ND | ND | ND | 0.024 | ND | ND | ND | ND | ND | ND | ND | 0.024 | ND | ND | ND | ND | 0.020 |
| Orthophosphate ($PO_4$) | mg/L | 0.020 | 0.02 - 0.16 [See Table AQ-4-5[2, 3]] | ND[HT] | ND[HT] | ND[HT] | ND[HT] | ND[HT] | ND[HT] | ND | ND[HT] | ND[HT] | ND | ND | ND | 0.02 | ND | ND | ND | ND | ND | ND | ND |
| Total Dissolved Solids[1] (TDS) | mg/L | 25 | 41 - 100 [See Table AQ-4-5[2, 3]] | ND[HT] | ND[HT] | ND[HT] | ND[HT] | ND[HT] | ND[HT] | 29 | ND[HT] | ND[HT] | ND | ND | 39 | **58** | **49[QD]** | 30 | **70** | **79** | **86** | 25 | 84 |
| Total Suspended Solids (TSS) | mg/L | 10 | NS | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Total Alkalinity | mg/L as $CaCO_3$ | 1.0 | >20[4] | **11** | **10** | **13** | **12** | 97 | **13** | **5.6** | **14** | **14** | **7.6** | **4.7** | **8.9** | **7.9** | 37 | **12** | **12** | **12** | **12** | **6.4** | 35 |

1 Due to a system error at WETLAB, the EPA recommended holding time for total dissolved solids was missed for eight sample sites. Samples were delivered within appropriate time windows

2 Water quality objective from the 2018 Water Quality Control Plan for the Tulare Lake Basin Second Edition (CRWQCB 2021)

3 Nitrate/Nitrite, TDS, TKN and PO4 for Reversed Creek, Silver Lake and Rush Creek have varying criteria for the Mono Basin and apply only to certain locations within the Project area. These are presented as annual average values in the Basin Plan.

4 The CCC of 20 mg/L is a minimum value except where alkalinity is naturally lower, in which case the criterion cannot be lower than 25 percent of the natural level.

Key:
**Bold** values do not meet the listed criteria
HT: Sample analyzed beyond the accepted holding time
M: The matrix spike (MS) value for the analysis of this parameter was outside acceptance criteria due to sample concentration or possible matrix inference. The reported result should be considered an estimate,
MDL (Method Detection Limit): The minimum measured concentration of a substance that can be reported with 99 percent confidence that the measured concentration is distinguishable from method blank results.
ND: Not detected
NS: No standard available
QD: The sample duplicate or matrix spike duplicate analysis demonstrated sample imprecision. The reported result should be considered an estimate.
RL (Reporting Limit): The lowest concentration of a substance that can be reliably reported under current laboratory operating conditions.

**Table 8.3-6. Summary of Seasonal Grab Sample Results Collected during the Fall 2023 Sampling Event**

| General Parameters | Units | RL | WQ Criteria | Site ID, Stream Segment, Date, Time | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | RC 23.0 | RC 21.65 | GL-1 (surface) | GL-1 (mid-Column) | GL-2 (surface) | GL-2 (mid-column) | RC 19.25 | AL-1 (surface) | AL-1 (mid-column) | RC 18.55 | PHTR | RC 17.15 | RC 17.6 | SL-1 (surface) | SL-1 (mid-column) | SL-2 (surface) | SL-2 (mid-column) | RC 15.2 | SRC 0.15[1] | RVC 0.26 |
| | | | | Waugh Lake | Rush Creek Below Rush Meadows Dam | Mid-Lake | Mid-Lake | Near Gem Dam | Near Gem Dam | Rush Creek Below Gem Dam | Mid-Lake | Mid-Lake | Rush Creek Below Agnew Dam | Rush Creek Power-house Tailrace | Rush Creek Above Silver Lake | Rush Creek Above Silver Lake | Mid-Lake | Mid-Lake | Near Outlet | Near Outlet | Rush Creek Below Silver Lake | South Rush Creek | Reversed Creek |
| | | | | 9/26 | 9/26 | 9/26 | 9/26 | 9/26 | 9/26 | 9/25 | 9/25 | 9/25 | 9/27 | 9/28 | 9/28 | 9/28 | 9/29 | 9/29 | 9/29 | 9/29 | 9/28 | 9/28 | 9/28 |
| | | | | 1530 | 1730 | 1045 | 1045 | 1130 | 1130 | 1230 | 1100 | 1100 | 1330 | 0955 | 1010 | 0945 | 0930 | 0930 | 1030 | 1030 | 1100 | 0930 | 1030 |
| Nitrate + Nitrite ($NO2 + NO_3$) | mg/L | 0.020 | 0.1 [See Table AQ-4-5[2, 3]] | ND | ND | ND | ND | ND[HT] | ND[HT] | ND[HT] | ND[HT] | ND[HT] | ND | ND[U, D] | ND[U, D] | ND[U, D] | ND[U, D] | ND[U, D] | ND[U, D] | ND[U, D] | ND[U, D] | ND[U, D] | 0.06[J] |
| Ammonia as N | mg/L | 0.10 | Varies See Table AQ 4-4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Total Kjeldahl Nitrogen (TKN) | mg/L | 0.20 | 0.1 - 0.2 [See Table AQ-4-5[2, 3]] | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Total Phosphorus | ug/L | 0.020 | NS | ND | ND | ND | 0.11 | ND | ND | ND | ND | ND | 0.038 | ND | ND | ND | ND | ND | ND | ND | 0.14 | ND | 0.1 |
| Orthophosphate ($PO_4$) | mg/L | 0.020 | 0.02 - 0.16 [See Table AQ-4-5[2, 3]] | ND | ND | ND | ND | ND | ND | ND[HT] | ND[HT] | ND[HT] | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Total Dissolved Solids (TDS) | mg/L | 25 | 41 - 100 [See Table AQ-4-5[2, 3]] | ND | ND | ND | ND | ND | ND | ND | 44 | 66 | 63 | ND | **64** | **79** | **51** | 32 | 43 | 41 | 43 | 40 | 95 |
| Total Suspended Solids (TSS) | mg/L | 10 | NS | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Total Alkalinity | mg/L as $CaCO_3$ | 1.0 | >20[4] | **16** | **2.5** | **2.6** | **2.6** | **16** | **3** | **6.7** | 37 | 36 | 85 | **3.6** | 36 | 48 | 29 | **15** | 31 | 31 | 21 | **17** | 53 |

1 SRC0.15 was dry in September. Samples taken at culvert crossing and confluence with an unnamed creek. This unnamed creek was still flowing in September, contributing to Rush Creek.
2 Water quality objective from the 2018 Water Quality Control Plan for the Tulare Lake Basin Second Edition (CRWQCB 2021)
3 Nitrate/Nitrite, TDS, TKN and PO4 for Reversed Creek, Silver Lake and Rush Creek have varying criteria for the Mono Basin and apply only to certain locations within the Project area. These are presented as annual average values in the Basin Plan.
4 The CCC of 20 mg/L is a minimum value except where alkalinity is naturally lower, in which case the criterion cannot be lower than 25 percent of the natural level.
5 Due to WETLAB instrumentation maintenance issues, testing as NO3 was not possible for grab samples collected during the late summer/early fall base flow period. Instead, samples were run using EPA 300.0 and flagged to bring the RL down. Values reported should be considered estimates per the lab.

Key: **Bold** values do not meet the listed criteria
D: Due to the sample matrix dilution was required in order to properly detect and report the anlyte. Reporting limit was adjusted accordingly.
HT: Sample analyzed beyond the accepted holding time
J: The reported value is between the lab method detection limit and the lab practical quantity limit. The result should be considered an estimate.
MDL (Method Detection Limit): The minimum measured concentration of a substance that can be reported with 99 percent confidence that the measured concentration is distinguishable from method blank results.
ND: Not detected
NS: No standard available
RL (Reporting Limit): The lowest concentration of a substance that can be reliably reported under current laboratory operating conditions.
U: The analyte was analyzed for, but was not detected above the level of the reported sample reporting/quantitation limit. The reported result should be considered an estimate.

**Table 8.3-7. Calculated Ammonia Concentration Criteria for the 2023 Spring and Fall Sampling Events**

| Sampling Location | Date | pH | Temperature (°C) | EPA Ammonia Chronic Criteria[1] | EPA Ammonia Acute Criteria[1] | Ammonia Concentration[2] (mg/L) |
|---|---|---|---|---|---|---|
| **Spring Sampling** | | | | | | |
| RC23.0 | 7/26/2023 | 6.83 | 3.5 | 4.61 | 27.49 | ND |
| RC21.65 | 7/26/2023 | 6.60 | 7.7 | 4.63 | 31.28 | ND |
| GL-1 (surface) | 7/24/2023 | 7.25 | 15.2 | 2.28 | 18.61 | ND |
| GL-1 (mid-Column) | 7/25/2023 | 6.64 | 8.7 | 4.31 | 30.70 | ND |
| GL-2 (surface)[3] | 7/24/2023 | - | - | - | - | ND |
| GL-2 (mid-column)[3] | 7/25/2023 | - | - | - | - | ND |
| RC19.25 | 6/27/2023 | 7.15 | 3.9 | 4.08 | 20.84 | ND |
| AL-1 (surface) | 7/25/2023 | 7.20 | 13.9 | 2.55 | 19.73 | ND |
| AL-1 (mid-column) | 7/25/2023 | 6.85 | 9.5 | 3.90 | 27.12 | ND |
| RC18.55 | 6/27/2023 | 7.08 | 5.2 | 4.22 | 22.38 | ND |
| PHTR | 6/26/2023 | 6.95 | 3.6 | 4.44 | 25.14 | ND |
| RC17.15 | 6/26/2023 | 7.10 | 5.7 | 4.18 | 21.94 | ND |
| RC17.6 | 6/26/2023 | 7.01 | 5.8 | 4.35 | 23.89 | ND |
| SL-1 (surface) | 6/26/2023 | 8.60 | 7.5 | 0.66 | 1.77 | ND |
| SL-1 (mid-column) | 6/26/2023 | 6.83 | 5.6 | 4.61 | 27.49 | ND |
| SL-2 (surface) | 6/26/2023 | 6.85 | 7.7 | 4.38 | 27.12 | ND |
| SL-2 (mid-column) | 6/26/2023 | 6.81 | 7.7 | 4.43 | 27.86 | ND |
| RC15.2 | 6/26/2023 | 6.94 | 6.8 | 4.46 | 25.35 | ND |
| SRC0.15 | 6/26/2023 | 7.23 | 5.9 | 3.91 | 19.06 | ND |
| RVC0.26 | 6/26/2023 | 7.30 | 7.2 | 3.70 | 17.51 | ND |

| Sampling Location | Date | pH | Temperature (°C) | EPA Ammonia Chronic Criteria[1] | EPA Ammonia Acute Criteria[1] | Ammonia Concentration[2] (mg/L) |
|---|---|---|---|---|---|---|
| **Fall Sampling** | | | | | | |
| RC23.0 | 9/26/2023 | 6.62 | 11.8 | 3.54 | 3.54 | ND |
| RC21.65 | 9/26/2023 | 6.57 | 11.8 | 3.57 | 3.57 | ND |
| GL-1 (surface) | 9/26/2023 | 7.11 | 11.5 | 3.12 | 3.12 | ND |
| GL-1 (mid-Column) | 9/26/2023 | 5.55 | 3.8 | 5.20 | 5.20 | ND |
| GL-2 (surface) | 9/26/2023 | 6.77 | 12.0 | 3.39 | 3.39 | ND |
| GL-2 (mid-column) | 9/26/2023 | 6.45 | 11.3 | 3.75 | 3.75 | ND |
| RC19.25 | 9/25/2023 | 7.27 | 10.9 | 2.97 | 2.97 | ND |
| AL-1 (surface) | 9/25/2023 | 7.08 | 10.6 | 3.35 | 3.35 | ND |
| AL-1 (mid-column) | 9/25/2023 | 7.07 | 10.6 | 3.36 | 3.36 | ND |
| RC18.55 | 9/27/2023 | 7.09 | 12.5 | 2.95 | 2.95 | ND |
| PHTR | 9/28/2023 | 7.13 | 12.4 | 2.91 | 2.91 | ND |
| RC17.15 | 9/28/2023 | 6.77 | 9.0 | 4.12 | 4.12 | ND |
| RC17.6 | 9/28/2023 | 7.35 | 7.6 | 3.49 | 3.49 | ND |
| SL-1 (surface) | 9/29/2023 | 7.10 | 12.5 | 2.93 | 2.93 | ND |
| SL-1 (mid-column) | 9/29/2023 | 7.05 | 11.9 | 3.12 | 3.12 | ND |
| SL-2 (surface) | 9/29/2023 | 7.10 | 12.8 | 2.88 | 2.88 | ND |
| SL-2 (mid-column) | 9/29/2023 | 7.10 | 12.4 | 2.95 | 2.95 | ND |
| RC15.2 | 9/28/2023 | 7.02 | 12.2 | 3.10 | 3.10 | ND |
| SRC0.15 | 9/28/2023 | 6.67 | 6.9 | 4.79 | 4.79 | ND |
| RVC0.26 | 9/28/2023 | 7.00 | 7.9 | 4.12 | 4.12 | ND |

[1] Ammonia criterion calculated using guidelines from the EPA's 2013 Aquatic Life Ambient Water Quality Criteria for Ammonia - Freshwater, which is based on ambient pH and temperature conditions.

[2] ND: Analyte was not detected above the method detection limit (MDL) and is therefore considered a non-detect. The MDL for ammonia is 0.015 mg/L.

[3] Values cannot be given due to water quality meter sensor malfunction on day of sampling at this location. Grab sample values were ND.

## Table 8.3-8. Summary of Analytical Results for Bacterial Sampling at Agnew and Gem Lakes in July 2023

| Sample Location | Test[1, 2] | Sample Dates | | | | |
|---|---|---|---|---|---|---|
| | | 7/5/2023 | 7/10/2023 | 7/14/2023 | 7/20/2023 | 7/31/2023 |
| Agnew Lake | Total Coliform (MPN/100mL) | 8.4 | 14.8 | 13.5 | 85.7 | 47.3 |
| | Fecal Coliform (MPN/100mL) | *Not Tested by Lab* | 1.0 | ND | ND | ND |
| | *E. coli* (MPN/100mL) | ND | ND | ND | 1.0 | ND |
| Gem Lake | Total Coliform (MPN/100mL) | 290.9 | 12997.0[3] | 13.4 | >24196.0[3] | 1553.1 |
| | Fecal Coliform (MPN/100mL) | *Not Tested by Lab* | 1355.0[3] | ND | 1408.0[3] | ND |
| | *E. coli* (MPN/100mL) | ND | ND[3] | ND | ND | ND |

Note: A result of zero (0) indicates absence for both fecal coliform and *E. coli* meaning the water meets the microbiological requirements of the EPA Safe Water Drinking Act. A result of one (1) for either test indicates presence, and the water does not the water does not meet the Safe Water Drinking Act requirements.

[1] *E. coli* testing was conducted by the state-certified laboratory, though it was not required by the AQ-4 Technical Study Plan.

[2] Due to a processing error at the state-certified laboratory, Fecal Coliform tests were not performed for Agnew or Gem Lake on July 5, 2023

[3] Reporting Limit increased from 1.0 to 10.0. When samples are heavily diluted by the laboratory, analysts may dilute the sample to read the test results properly. This dilution will increase the reporting limit.

Key: MPN = Most probable number of bacterial colonies per 100 mL of water.

# FIGURES

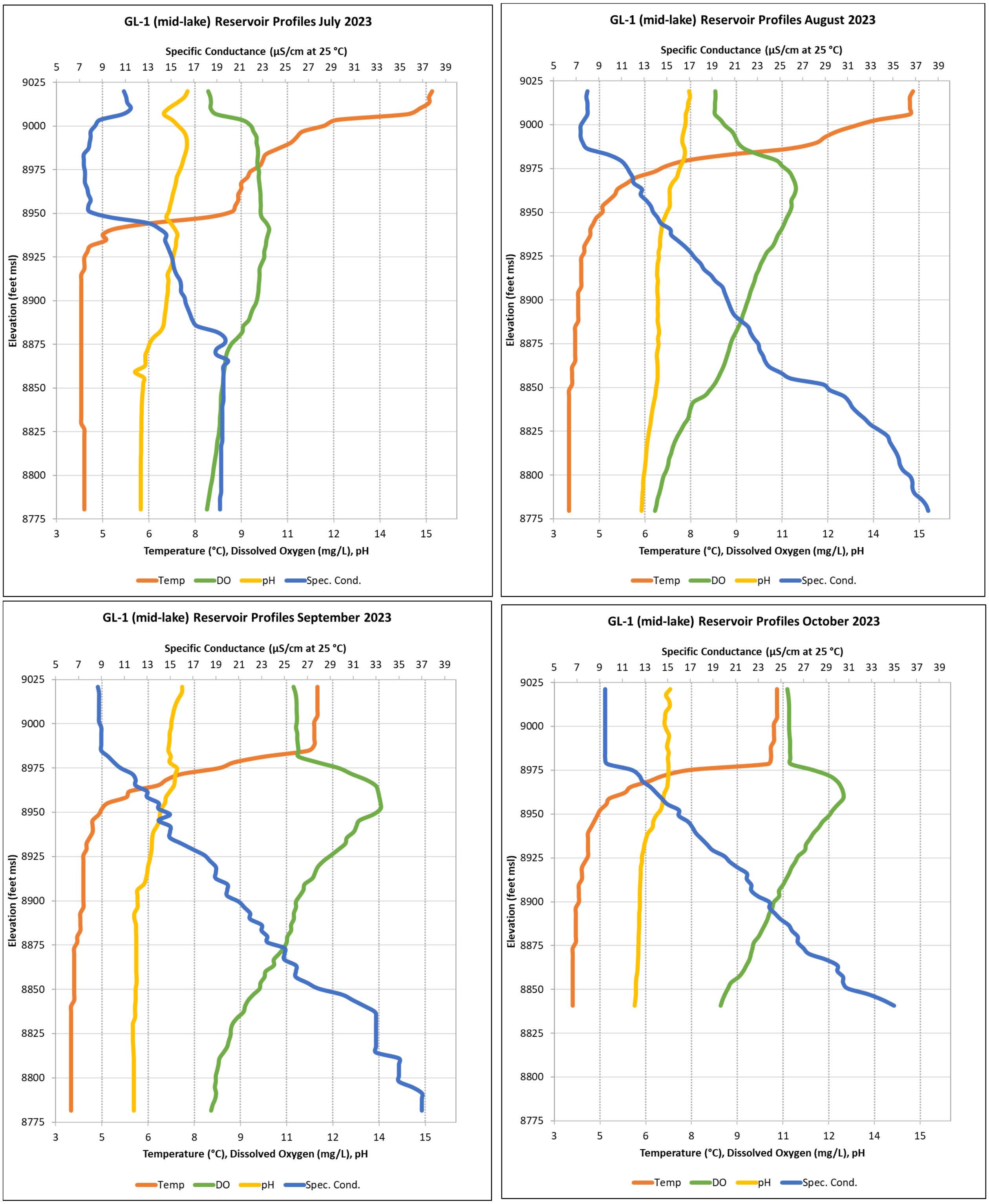



**Figure 8.3-1. Gem Lake (GL-1; Mid-Lake) Profiles for Water Temperature, DO, pH, and Specific Conductance from July through October 2023**

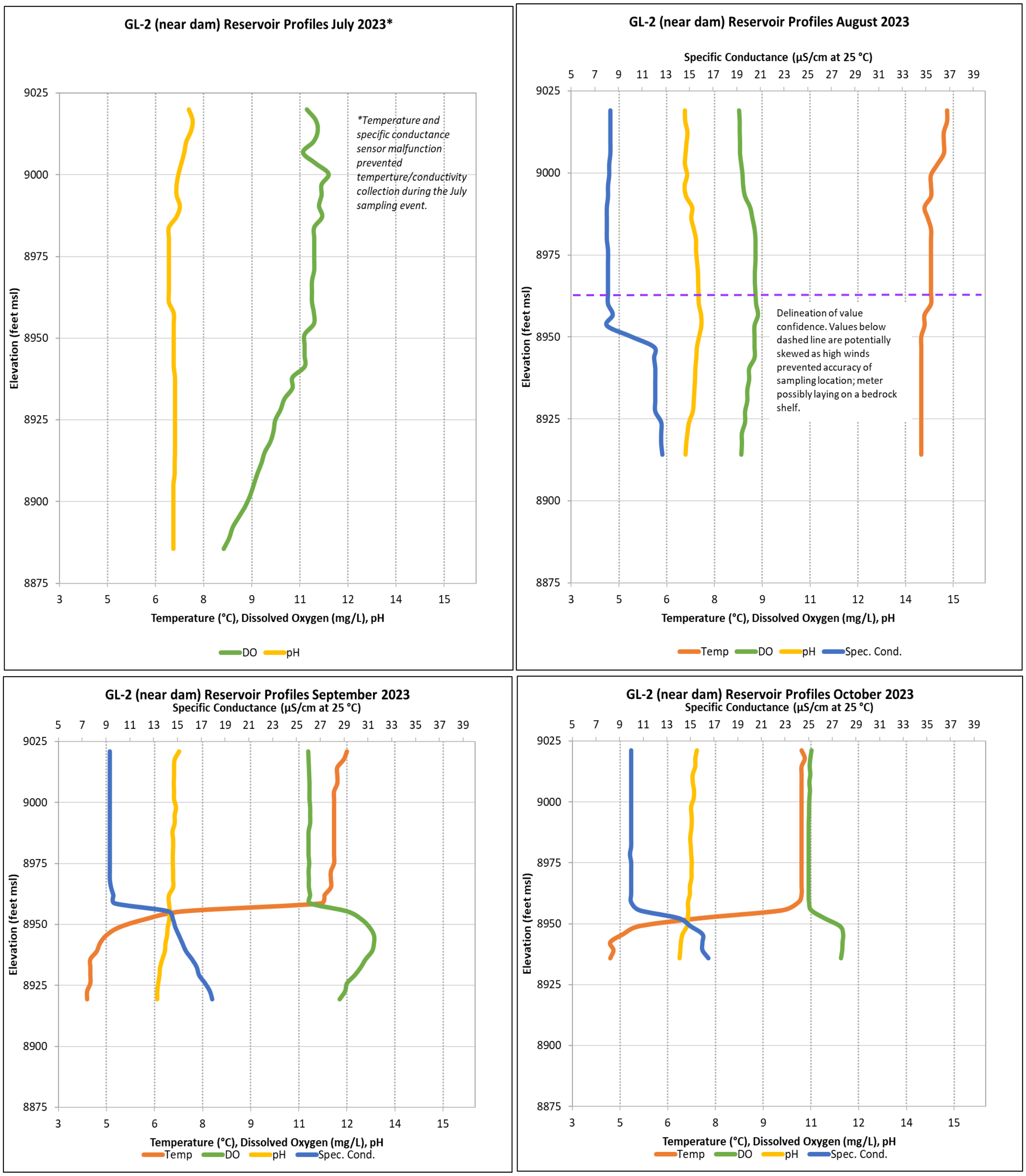



**Figure 8.3-2 Gem Lake (GL-2; Near Dam) Profiles for Water Temperature, DO, pH, and Specific Conductance from July through October 2023**

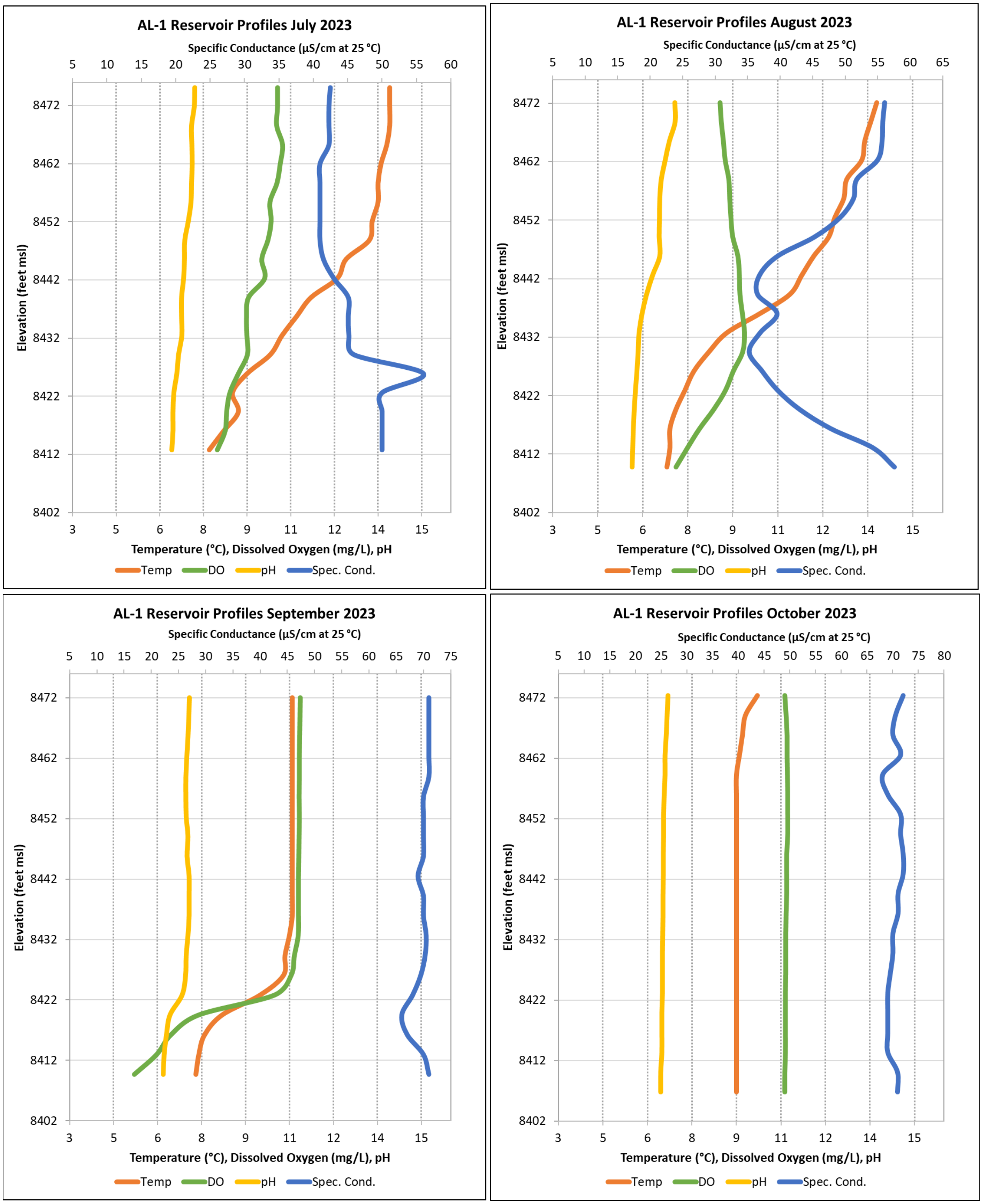



**Figure 8.3-3. Agnew Lake Profiles for Water Temperature, DO, pH, and Specific Conductance from July through October 2023**

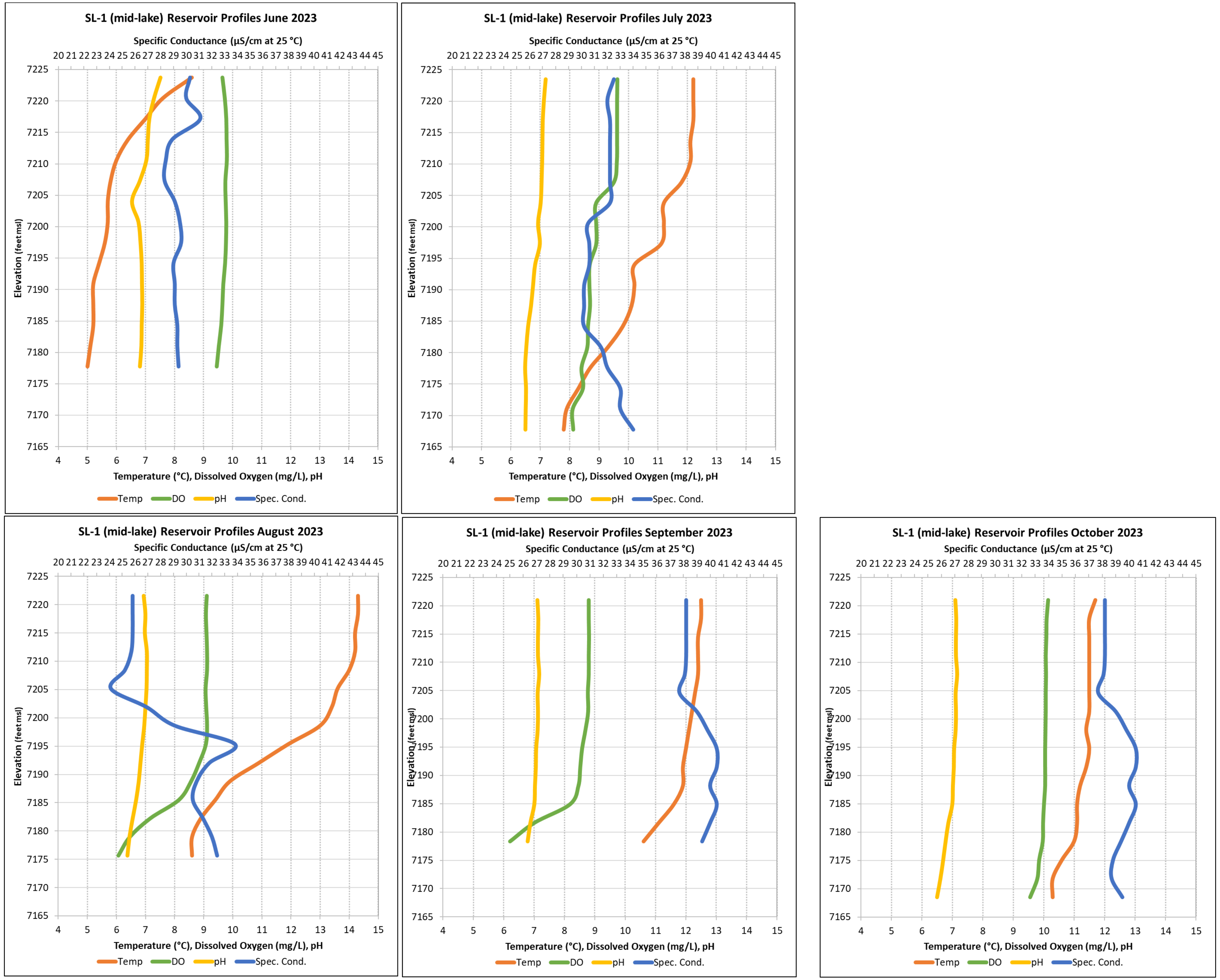



**Figure 8.3-4. Silver Lake (SL-1; Mid-Lake) Profiles for Water Temperature, DO, pH, and Specific Conductance from June through October 2023**

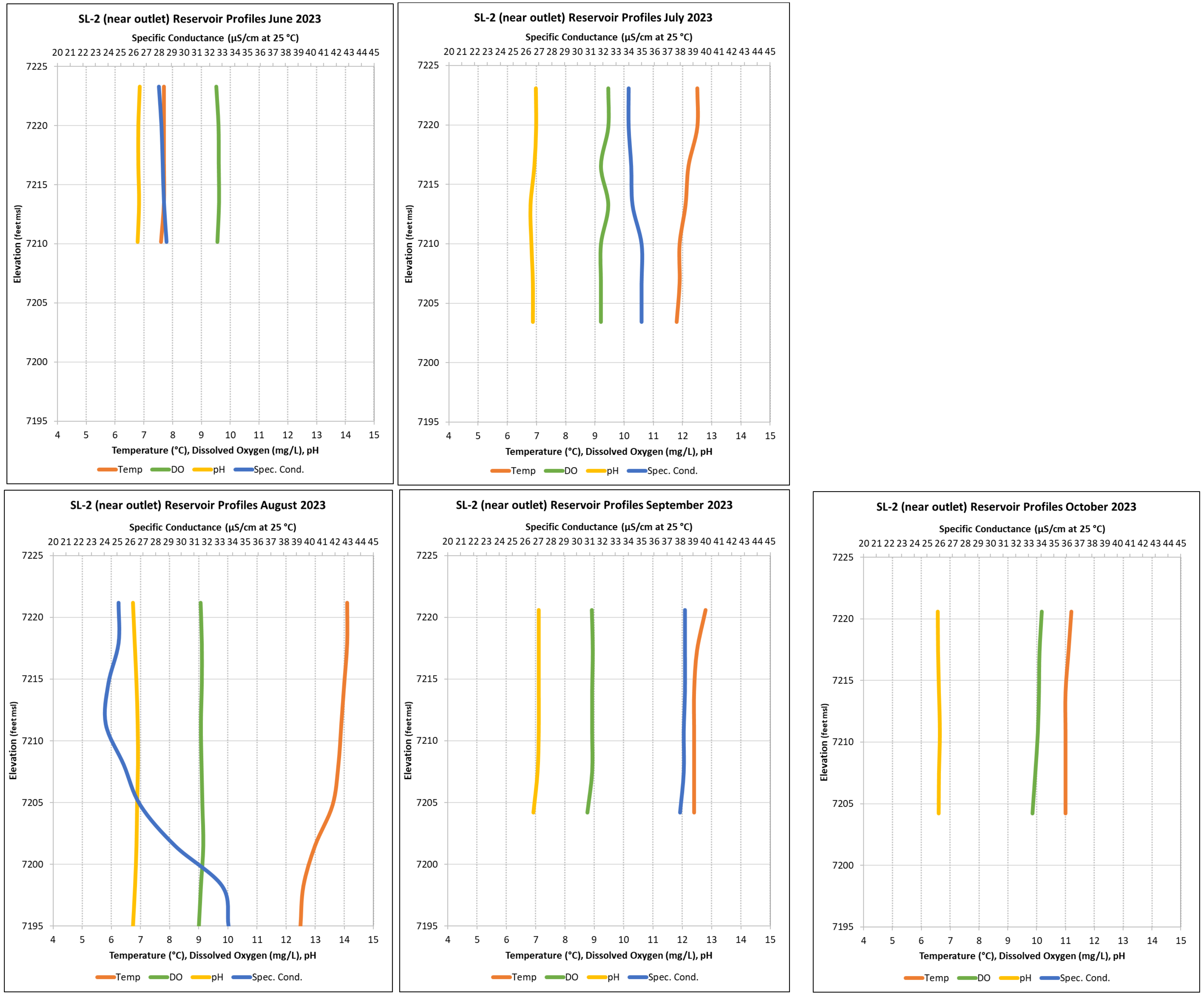



**Figure 8.3-5. Silver Lake (SL-2; Near Outlet) Profiles for Water Temperature, DO, pH, and Specific Conductance from June through October 2023**

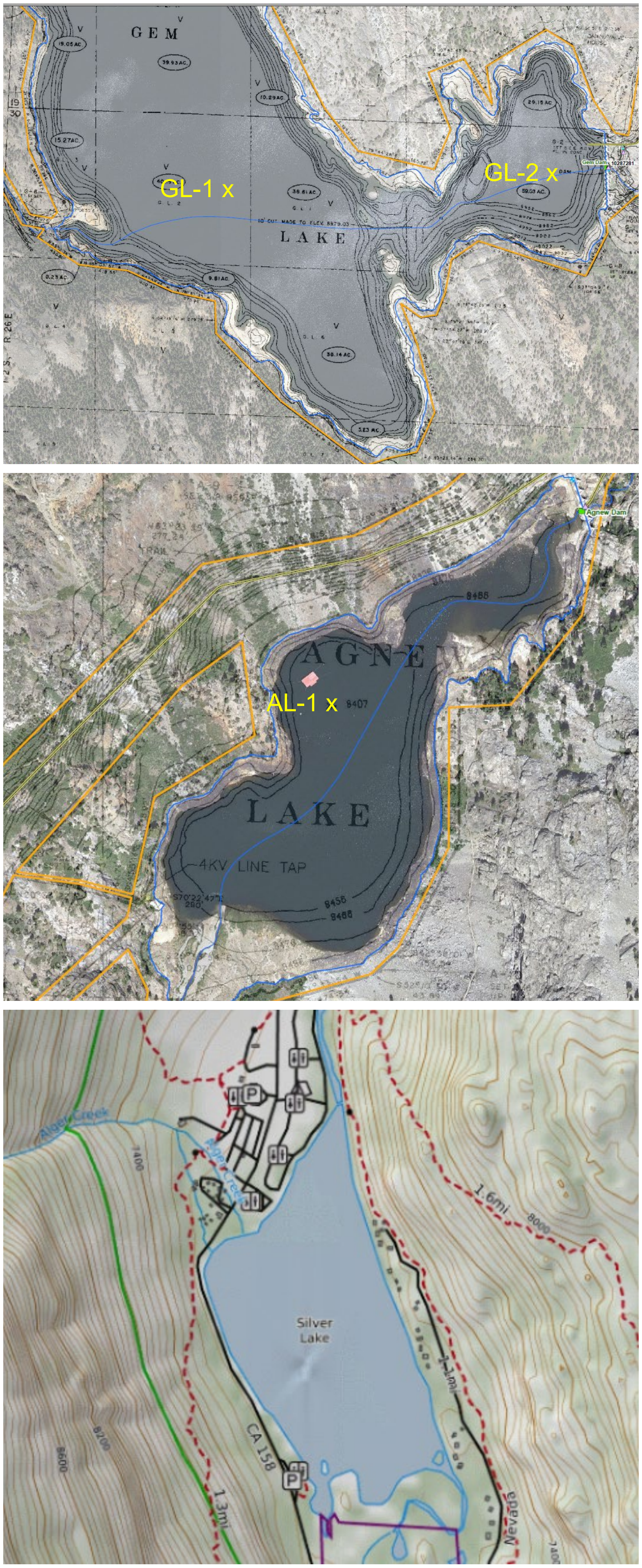
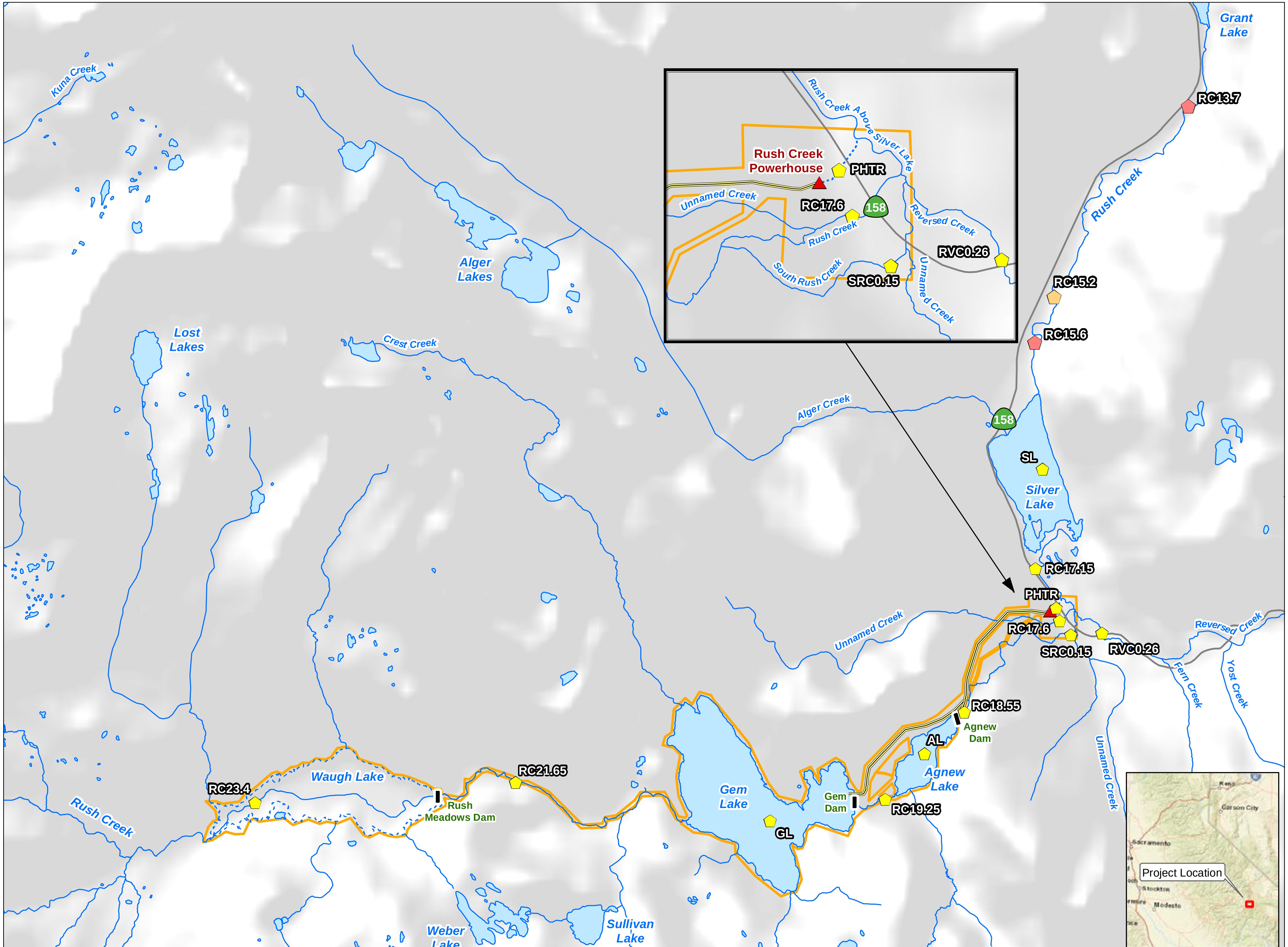



**Figure 8.3-6. Gem, Agnew, and Silver Lake Profile Sampling Locations**

# MAPS




## SCE Facilities

- Dam
- Powerhouse
- Flowline / Penstock
- Tailrace

## Other Features

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

## Sampling Locations

- Water Temp
- Water Quality
- Water Temp, Water Quality

SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead℠

Rush Creek Project (FERC 1389)

**Map 8.3-1**

**Water Temperature and Water Quality Sampling Locations**

N W E S

0 0.25 0.5 Miles

Date: 5/5/2024

**Projection: UTM Zone 11**
**Datum: NAD 83**



C:\GIS\237800343\map\Rush Creek\AquaticMaps\SCE_RUSH_CREEK_AQ3_4TSP_SamplingLocations_17i11i_03.mxd

# APPENDIX 8.3-A

## Summary of Historical Water Quality Data

## Table 8.3-A1. USGS Water Quality Monitoring in Rush Creek and Major Tributaries in the Vicinity of the Rush Creek Project

| | | | | | | | General Parameters | | | | | | | | | | | | | | | | Trace Elements | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Date | Temperature (deg C) | Discharge, cubic feet per second | pH, water, unfiltered, field, standard units | Specific conductance, water, unfiltered, microsiemens per centimeter at 25 degrees Celsius | Dissolved oxygen, water, unfiltered, milligrams per liter | Dissolved Oxygen, percent of saturation (Fresh water assuming barometric pressure of 750 mm Hg) | Ammonia, water, filtered, milligrams per liter as NH4 | Bicarbonate, water, unfiltered, fixed endpoint (pH 4.5) titration, field, milligrams per liter | Calcium, water, filtered, milligrams per liter | Chloride, water, filtered, milligrams per liter | Fluoride, water, filtered, milligrams per liter | Hardness, water, milligrams per liter as calcium carbonate | Magnesium, water, filtered, milligrams per liter | Nitrate, water, filtered, milligrams per liter | Nitrite, water, filtered, milligrams per liter as nitrogen | Orthophosphate, water, filtered, milligrams per liter | Phosphorus, water, filtered, milligrams per liter as phosphorus | Potassium, water, filtered, milligrams per liter | Silica, water, filtered, milligrams per liter as SiO2 | Sodium, water, filtered, milligrams per liter | Sulfate, water, filtered, milligrams per liter | Dissolved solids, water, filtered, sum of constituents, milligrams per liter | Boron, water, filtered, micrograms per liter | Iron, water, filtered, micrograms per liter | Manganese, water, filtered, micrograms per liter |
| **USGS 10287300 RUSH C PP TAILRACE NR JUNE LAKE CA** | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Applicable Water Quality Objective or Standard** | NS | NS | 6.5-9.0 | NS | Meet or exceed 8.0 | NS | Min 0.86 | NS | NS | NA | NS | NS | NS | 0.1 | NS | 0.02/0.07[1] | NS | NS | NS | NS | NS | 41/58[1] | NS | NS | NS |
| 4/26/1994 | 3 | 38 | 6.8 | 19 | 9.6 | 92% | 0.01 | 15 | 1.9 | 0.7 | 0.1 | 5.61 | 0.21 | 0.05 | 0.01 | 0.031 | 0.01 | 0.3 | 3.7 | 0.9 | 1.1 | 16 | 10 | 13 | 9 |
| 6/7/1994 | 9.9 | 34 | 7.4 | 20 | 8.5 | 98% | 0.02 | 8 | 2.2 | 0.6 | 0.1 | 6.4 | 0.22 | 0.05 | 0.01 | 0.031 | 0.01 | 0.3 | 5 | 0.9 | 1.1 | 14 | 10 | 3 | 9 |
| 7/27/1994 | 16 | 24 | 7.5 | 14 | 7.5 | 99% | 0.03 | 7 | 1.5 | 0.3 | 0.1 | 4.4 | 0.16 | 0.05 | 0.01 | 0.031 | 0.01 | 0.2 | 3.1 | 0.7 | 0.7 | 10 | 10 | 8 | 1 |
| 7/27/1994 | 16 | 24 | 7.5 | 14 | 7.5 | 99% | 0.02 | 7 | 1.5 | 0.3 | 0.1 | 4.36 | 0.15 | 0.05 | 0.01 | 0.031 | 0.01 | 0.2 | 3.1 | 0.7 | 0.7 | 10 | 10 | 15 | 1 |
| 9/6/1994 | 15 | 24 | 7.9 | 17 | 7 | 90% | 0.01 | 7 | 1.6 | 0.4 | 0.1 | 4.65 | 0.16 | 0.05 | 0.01 | 0.031 | 0.01 | 0.3 | 3 | 0.7 | 0.6 | 10 | 10 | 8 | 1 |
| 9/6/1994 | 15 | 24 | 7.9 | 15 | 7 | 90% | 0.01 | 7 | 1.6 | 0.3 | 0.1 | 4.61 | 0.15 | 0.05 | 0.01 | 0.031 | 0.01 | 0.3 | 3 | 0.7 | 0.6 | 10 | 10 | 4 | 1 |
| 10/11/1994 | 11 | 22 | 6.8 | 13 | 8.4 | 99% | 0.02 | 5 | 1.4 | 0.3 | 0.1 | 4.07 | 0.14 | 0.05 | 0.01 | 0.031 | 0.01 | 0.2 | 2.6 | 0.7 | 0.7 | 9 | 10 | 4 | 1 |
| **USGS 374557119071401 RUSH C A HWY 158 NR JUNE LAKE CA** | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Applicable Water Quality Objective or Standard** | NS | NS | 6.5-9.0 | NS | Meet or exceed 8.0 | NS | Min 0.86 | NS | NS | NA | NS | NS | NS | 0.1 | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| 4/26/1994 | 1.5 | 1.9 | 8.2 | 174 | 10 | 92% | 0.01 | 92 | 27 | 2.1 | 0.1 | 75.7 | 2 | 0.05 | 0.01 | 0.031 | 0.01 | 1.3 | 15 | 3 | 7.2 | 103 | 50 | 7 | 2 |
| 6/7/1994 | 8.7 | 1.3 | 8.5 | 211 | 8.9 | 99% | 0.02 | 112 | 34 | 3.6 | 0.1 | 94.8 | 2.4 | 0.05 | 0.01 | 0.031 | 0.01 | 1.5 | 17 | 3.7 | 7.5 | 127 | 50 | 3 | 2 |
| 7/27/1994 | 20 | 0.06 | 8.2 | 273 | 6.8 | 96% | 0.02 | 144 | 42 | 12 | 0.2 | 118 | 3.1 | 0.05 | 0.01 | 0.031 | 0.01 | 1.8 | 17 | 8.5 | 4.7 | 160 | 0 | 3 | 2 |
| **USGS 374553119070101 REVERSED C A DREAM MTN RD NR JUNE LAKE CA** | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Applicable Water Quality Objective or Standard** | NS | NS | 6.5-9.0 | NS | Meet or exceed 8.0 | NS | Min 0.86 | NS | NS | NA | NS | NS | NS | 0.1 | NS | 0.16/0.35[1] | NS | NS | NS | NS | NS | 100/130[1] | NS | NS | NS |
| 4/25/1994 | 4 | 6.2 | 7.8 | 91 | 9.4 | 93% | 0.01 | 47 | 11 | 1.4 | 0.1 | 32.8 | 1.3 | 0.05 | 0.01 | 0.031 | 0.01 | 1.6 | 27 | 3.7 | 4.6 | 74 | 10 | 81 | 8 |
| 6/7/1994 | 5.2 | NA | 7.6 | NA | 9.6 | 98% | 0.02 | 22 | NA | NA | NA | NA | NA | 0.05 | 0.01 | 0.031 | 0.01 | NA | NA | NA | NA | NA | NA | NA | NA |
| 6/7/1994 | 5.2 | 14 | 7.6 | 49 | 9.6 | 98% | 0.02 | 22 | 6 | 0.3 | 0.1 | 17.9 | 0.71 | 0.05 | 0.01 | 0.031 | 0.01 | 0.8 | 17 | 1.8 | 3.6 | 41 | 10 | 23 | 4 |
| 7/27/1994 | 12 | 2.9 | 8 | 98 | 8.1 | 98% | 0.02 | 52 | 13 | 0.5 | 0.1 | 39.1 | 1.6 | 0.056 | 0.01 | 0.031 | 0.01 | 1.2 | 31 | 3.4 | 5 | 82 | 10 | 30 | 3 |
| 9/6/1994 | 13 | 1.4 | 8 | 114 | 7.9 | 97% | 0.02 | 61 | 16 | 0.7 | 0.2 | 47.4 | 1.8 | 0.055 | 0.01 | 0.061 | 0.01 | 1.7 | 36 | 4 | 4.9 | 96 | 10 | 36 | 4 |
| 10/11/1994 | 8.5 | 2.8 | 7.5 | 112 | 8.5 | 94% | 0.02 | 58 | 16 | 0.7 | 0.1 | 47.8 | 1.9 | 0.05 | 0.01 | 0.031 | 0.01 | 1.7 | 35 | 4.2 | 6.8 | 95 | 10 | 50 | 5 |
| **USGS 10287400 RUSH C AB GRANT LK NR JUNE LK CA** | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Applicable Water Quality Objective or Standard** | NS | NS | 6.5-9.0 | NS | Meet or exceed 8.0 | NS | Min 0.86 | NS | NS | NA | NS | NS | NS | 0.1 | NS | 0.07/0.09[1] | NS | NS | NS | NS | NS | 58/70[1] | NS | NS | NS |
| 4/26/1994 | 8 | 60 | 7.6 | 53 | 9 | 98% | 0.01 | 23 | 6.5 | 1.1 | 0.1 | 18.7 | 0.61 | 0.05 | 0.01 | 0.031 | 0.01 | 0.7 | 8.3 | 2 | 2.8 | 33 | 20 | 16 | 4 |
| 6/7/1994 | 13.8 | 78 | 8 | 48 | 8.1 | 102% | 0.02 | 23 | 6.2 | 0.9 | 0.1 | 17.6 | 0.51 | 0.05 | 0.01 | 0.031 | 0.01 | 0.6 | 8 | 1.5 | 3.4 | 32 | 10 | 12 | 5 |
| 7/27/1994 | 22 | 30 | 7.9 | 39 | 6.5 | 97% | 0.02 | 18 | 4.9 | 0.6 | 0.1 | 14 | 0.44 | 0.05 | 0.01 | 0.031 | 0.01 | 0.5 | 6.8 | 1.4 | 2.3 | 26 | 20 | 15 | 3 |
| 9/6/1994 | 19 | 25 | 7.8 | 41 | 7.3 | 102% | 0.02 | 20 | 5.1 | 0.6 | 0.1 | 14.6 | 0.46 | 0.05 | 0.01 | 0.031 | 0.01 | 0.6 | 6.7 | 1.4 | 2 | 27 | 10 | 15 | 5 |
| 10/11/1994 | 14.8 | 31 | 7.2 | 41 | 8 | 103% | 0.02 | 19 | 5.5 | 0.6 | 0.1 | 15.8 | 0.5 | 0.05 | 0.01 | 0.031 | 0.01 | 0.5 | 7.3 | 1.5 | 2.6 | 28 | 20 | 24 | 11 |

Notes: Green Highlight – Measurements that exceed the applicable water quality objective or standard

[1] Annual Average Value/$90^{th}$ Percentile Value

## Table 8.3-A2. USGS Water Quality Monitoring in Silver Lake downstream of the Rush Creek Project

| Sample Date | Sample Time | Temperature, water, degrees Celsius | Specific conductance, water, unfiltered, microsiemens per centimeter at 25 degrees Celsius | Sampling depth, meters | Dissolved oxygen, water, unfiltered, milligrams per liter | Dissolved oxygen, water, unfiltered, percent of saturation | pH, water, unfiltered, field, standard units | Acid neutralizing capacity, water, unfiltered, inflection-point titration method (incremental titration method), field, milligrams per liter as calcium carbonate | Bicarbonate, water, unfiltered, inflection-point titration method (incremental titration method), field, milligrams per liter | Total nitrogen [nitrate + nitrite + ammonia + organic-N], water, unfiltered, milligrams per liter | Total nitrogen [nitrate + nitrite + ammonia + organic-N], water, filtered, milligrams per liter | Organic nitrogen, water, unfiltered, milligrams per liter as nitrogen | Organic nitrogen, water, filtered, milligrams per liter as nitrogen | Ammonia (NH3 + NH4+), water, filtered, milligrams per liter as nitrogen | Nitrite, water, filtered, milligrams per liter as nitrogen | Nitrate, water, filtered, milligrams per liter as nitrogen | Nitrate plus nitrite, water, filtered, milligrams per liter as nitrogen | Orthophosphate, water, filtered, milligrams per liter as PO4 | Phosphorus, water, unfiltered, milligrams per liter as phosphorus | Phosphorus, water, filtered, milligrams per liter as phosphorus | Hardness, water, milligrams per liter as calcium carbonate | Calcium, water, filtered, milligrams per liter | Magnesium, water, filtered, milligrams per liter | Sodium, water, filtered, milligrams per liter | Potassium, water, filtered, milligrams per liter | Chloride, water, filtered, milligrams per liter | Sulfate, water, filtered, milligrams per liter | Fluoride, water, filtered, milligrams per liter | Silica, water, filtered, milligrams per liter as SiO2 | Boron, water, filtered, micrograms per liter | Iron, water, filtered, micrograms per liter | Manganese, water, filtered, micrograms per liter | Dissolved solids, water, filtered, sum of constituents, milligrams per liter | Chlorophyll a, phytoplankton, chromatographic-fluorometric method, micrograms per liter | Chlorophyll b, phytoplankton, chromatographic-fluorometric method, micrograms per liter |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Applicable Water Quality Objective or Standard | | NS | NS | - | 8 | NS | NS | NS | NS | NS | NS | NS | NS | 0.83 | NS | NS | NS | 0.06/ 0.09 | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | 45/60 | NS | NS |
| **Silver Lake Site 1 - USGS 374643119073701** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4/27/1994 | 15:10 | 6.5 | 42 | 1 | 9.6 | 103 | 6.9 | 18 | 22 | < 0.75 | < 0.25 | 0.68 | < 0.18 | 0.02 | < 0.010 | < 0.050 | < 0.050 | < 0.031 | 0.03 | < 0.01 | 16.8 | 5.8 | 0.57 | 1.9 | 0.6 | 1.1 | 2.5 | < 0.10 | 7.3 | 20 | 5 | 2 | 31 | 0.9 | < 0.1 |
| 4/27/1994 | 15:20 | 6.2 | 43 | 10 | 9.4 | 100 | 7 | 17 | 21 | < 0.75 | < 0.25 | 0.68 | < 0.18 | 0.02 | < 0.010 | < 0.050 | < 0.050 | < 0.031 | 0.03 | < 0.01 | 16.5 | 5.7 | 0.55 | 1.9 | 0.6 | 1.5 | 2.5 | < 0.10 | 7.3 | 20 | 17 | 1 | 30 | | |
| 6/9/1994 | 8:55 | 12.2 | 39 | 1 | 8.4 | 101 | 6.5 | 17 | 21 | < 0.25 | < 0.25 | < 0.17 | < 0.17 | 0.03 | < 0.010 | < 0.050 | < 0.050 | < 0.031 | < 0.01 | 0.02 | 16 | 5.6 | 0.48 | 1.3 | 0.6 | 0.8 | 3.1 | < 0.10 | 7.5 | < 10 | 11 | 3 | 30 | < 0.1 | < 0.1 |
| 6/9/1994 | 9:01 | 10.7 | 39 | 6 | 8.7 | 101 | 6.8 | | | | | | | | | | | | | | | | | | | | | | | | | | | 0.9 | 0.3 |
| 6/9/1994 | 9:11 | 8.3 | 42 | 13 | 7.7 | 85 | 6.9 | 18 | 22 | < 0.25 | < 0.25 | < 0.17 | < 0.17 | 0.03 | < 0.010 | < 0.050 | < 0.050 | < 0.031 | < 0.01 | < 0.01 | 16.6 | 5.8 | 0.51 | 1.4 | 0.6 | 1 | 3.1 | < 0.10 | 7.8 | < 10 | 9 | < 1.00 | 31 | | |
| 6/9/1994 | 9:20 | 12.2 | 39 | 1 | 8.4 | 101 | 6.5 | 17 | 21 | < 0.25 | < 0.25 | < 0.18 | < 0.18 | 0.02 | < 0.010 | < 0.050 | < 0.050 | < 0.031 | < 0.01 | < 0.01 | 15.9 | 5.6 | 0.46 | 1.2 | 0.6 | 0.9 | 3.1 | < 0.10 | 7.3 | 10 | 10 | 3 | 30 | | |
| 7/28/1994 | 9:39 | 18.7 | 29 | 1 | 6.9 | 96 | 6.4 | 13 | 15 | < 0.55 | < 0.25 | 0.47 | 0.17 | 0.03 | < 0.010 | < 0.050 | < 0.050 | 0.153 | 0.09 | 0.06 | 11.2 | 3.9 | 0.36 | 1.2 | 0.4 | 0.5 | 1.8 | < 0.10 | 5.6 | 10 | 6 | < 1.00 | 21 | 0.2 | < 0.1 |
| 7/28/1994 | 9:51 | 17.2 | 31 | 6 | 7.2 | 97 | 6.7 | | | | | | | | | | | | | | | | | | | | | | | | | | | 0.5 | < 0.1 |
| 7/28/1994 | 9:55 | 14.3 | 45 | 9 | 7.9 | 100 | 6.6 | 17 | 20 | < 0.45 | < 0.25 | 0.38 | < 0.18 | 0.02 | < 0.010 | < 0.050 | < 0.050 | < 0.031 | 0.03 | 0.02 | 16.5 | 5.8 | 0.5 | 1.7 | 0.5 | 0.9 | 2.6 | < 0.10 | 7 | 10 | 5 | 14 | 29 | 0.7 | < 0.1 |
| 7/28/1994 | 10:04 | 10.8 | 44 | 13.5 | 2.3 | 27 | 6.4 | 18 | 22 | < 0.25 | < 0.25 | < 0.18 | < 0.18 | 0.02 | < 0.010 | < 0.050 | < 0.050 | < 0.031 | 0.01 | 0.01 | 17.4 | 6.1 | 0.52 | 1.7 | 0.4 | 0.9 | 2.7 | < 0.10 | 8 | 10 | 40 | 170 | 31 | | |
| 10/13/1994 | 14:59 | 10.9 | 32 | 1 | 7.6 | 90 | 7.7 | 14 | 16 | < 0.25 | < 0.25 | < 0.18 | < 0.18 | 0.02 | < 0.010 | < 0.050 | < 0.050 | < 0.031 | < 0.01 | < 0.01 | 13.3 | 4.6 | 0.44 | 1.4 | 0.4 | 0.6 | 2.1 | < 0.10 | 6.1 | < 10 | 28 | 33 | 24 | 0.4 | 0.1 |
| 10/13/1994 | 15:04 | 10.9 | 32 | 6 | 7.6 | 90 | 7.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | 0.4 | < 0.1 |
| 10/13/1994 | 15:11 | 10.9 | 32 | 13 | 7.6 | 90 | 7.4 | 14 | 17 | < 0.25 | < 0.25 | < 0.18 | < 0.18 | 0.02 | < 0.010 | < 0.050 | < 0.050 | < 0.031 | 0.04 | < 0.01 | 13 | 4.6 | 0.44 | 1.4 | 0.5 | 0.6 | 2.1 | < 0.10 | 6.2 | 20 | 55 | 44 | 24 | | |
| **Silver Lake Site 2 - USGS 374638119072101** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4/26/1994 | 16:05 | 6.5 | 41 | 1 | 9.7 | 104 | 6.9 | 17 | 20 | < 0.25 | < 0.25 | < 0.20 | < 0.20 | < 0.010 | < 0.010 | < 0.050 | < 0.050 | < 0.031 | < 0.01 | < 0.01 | 16.5 | 5.7 | 0.55 | 1.9 | 0.6 | 1.5 | 2.5 | < 0.10 | 7.3 | 20 | 12 | 2 | 30 | 1.9 | < 0.1 |
| 4/26/1994 | 16:15 | 6.1 | 41 | 10 | 9.8 | 104 | 7.1 | 17 | 21 | < 0.25 | < 0.25 | < 0.20 | < 0.20 | < 0.010 | < 0.010 | < 0.050 | < 0.050 | < 0.031 | < 0.01 | < 0.01 | 16.2 | 5.6 | 0.55 | 1.9 | 0.6 | 1 | 2.4 | < 0.10 | 7.4 | 20 | 18 | 3 | 30 | | |
| 6/9/1994 | 9:59 | 12.2 | 38 | 1 | 8.4 | 101 | 7.3 | 16 | 20 | < 0.25 | < 0.25 | < 0.18 | < 0.18 | 0.02 | < 0.010 | < 0.050 | < 0.050 | < 0.031 | 0.01 | < 0.01 | 15.6 | 5.5 | 0.46 | 1.3 | 0.6 | 0.8 | 3 | < 0.10 | 7.5 | 10 | 10 | 3 | 29 | < 0.1 | < 0.1 |
| 6/9/1994 | 10:12 | 8.2 | 42 | 13 | 7.7 | 85 | 7.1 | 17 | 21 | < 0.25 | < 0.25 | < 0.17 | < 0.17 | 0.03 | < 0.010 | < 0.050 | < 0.050 | < 0.031 | < 0.01 | < 0.01 | 16.6 | 5.8 | 0.52 | 1.5 | 0.6 | 1 | 3 | < 0.10 | 7.9 | 10 | 9 | < 1.00 | 31 | | |
| 7/28/1994 | 12:12 | 19.2 | 29 | 1 | 7.1 | 100 | 7 | 12 | 15 | < 0.25 | < 0.25 | < 0.19 | < 0.19 | 0.01 | < 0.010 | < 0.050 | < 0.050 | < 0.031 | < 0.01 | 0.02 | 10.9 | 3.8 | 0.35 | 1.2 | 0.4 | 0.5 | 1.7 | < 0.10 | 5.6 | 10 | 9 | 4 | 21 | 0.2 | < 0.1 |
| 7/28/1994 | 12:24 | 15.6 | 40 | 7 | 7.3 | 95 | 6.9 | 14 | 17 | < 0.25 | < 0.25 | < 0.18 | < 0.18 | 0.02 | < 0.010 | < 0.050 | < 0.050 | < 0.031 | 0.02 | < 0.01 | 12.6 | 4.4 | 0.4 | 1.4 | 0.4 | 0.6 | 1.9 | < 0.10 | 6.2 | < 10 | 8 | 6 | 24 | 0.9 | < 0.1 |
| 7/28/1994 | 12:32 | 13 | 42 | 11 | 5.5 | 68 | 6.7 | 16 | 20 | < 0.25 | < 0.25 | < 0.18 | < 0.18 | 0.02 | < 0.010 | < 0.050 | < 0.050 | < 0.031 | 0.03 | < 0.01 | 16.5 | 5.8 | 0.5 | 1.6 | 0.8 | 0.9 | 2.7 | < 0.10 | 7.5 | 10 | 9 | 62 | 30 | | |
| 10/13/1994 | 15:51 | 10.9 | 31 | 1 | 7.7 | 92 | 7.2 | 14 | 17 | < 0.25 | < 0.25 | < 0.18 | < 0.18 | 0.02 | < 0.010 | < 0.050 | < 0.05 | < 0.031 | < 0.01 | < 0.01 | 13.3 | 4.6 | 0.44 | 1.4 | 0.4 | 0.6 | 2 | < 0.10 | 6.2 | < 10 | 23 | 34 | 24 | 0.4 | 0.1 |
| 10/13/1994 | 16:00 | 10.8 | 32 | 10 | 7.6 | 90 | 7.2 | 13 | 16 | < 0.25 | < 0.25 | < 0.18 | < 0.18 | 0.02 | < 0.010 | < 0.050 | < 0.05 | < 0.031 | 0.02 | 0.01 | 13 | 4.5 | 0.43 | 1.4 | 0.4 | 0.6 | 2.1 | < 0.10 | 6.2 | 10 | 26 | 33 | 24 | | |
| **Silver Lake Site 3 - USGS 374628119072801** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4/27/1994 | 16:25 | 6.8 | 43 | 1 | 9.9 | 107 | 6.8 | 21 | 26 | < 0.25 | < 0.25 | 0.2 | 0.2 | < 0.01 | < 0.01 | < 0.05 | < 0.05 | < 0.031 | < 0.01 | < 0.01 | 18 | 6.2 | 0.61 | 2.1 | 0.6 | 1.6 | 2.3 | < 0.1 | 7.3 | 20 | 10 | 3 | 34 | 1.1 | < 0.1 |
| 4/27/1994 | 16:33 | 6 | 39 | 8.5 | 10 | 106 | 7 | 18 | 22 | < 0.25 | < 0.25 | 0.2 | 0.2 | < 0.01 | < 0.01 | < 0.05 | < 0.05 | < 0.031 | < 0.01 | < 0.01 | 16.8 | 5.8 | 0.56 | 1.9 | 0.6 | 1.1 | 2.4 | < 0.1 | 7.2 | 20 | 12 | 3 | 30 | | |
| 6/9/1994 | 11:37 | 12.7 | 38 | 1 | 8.4 | 102 | 7.6 | 16 | 20 | < 0.25 | < 0.25 | 0.18 | 0.18 | 0.02 | < 0.01 | < 0.05 | < 0.05 | < 0.031 | < 0.01 | < 0.01 | 15.7 | 5.5 | 0.47 | 1.3 | 0.6 | 0.8 | 3 | < 0.1 | 7.4 | 10 | 10 | 2 | 29 | < 0.1 | < 0.1 |
| 6/9/1994 | 11:46 | 10.1 | 42 | 10 | 8.4 | 96 | 7.3 | 17 | 21 | < 0.25 | < 0.25 | 0.17 | 0.17 | 0.03 | < 0.01 | < 0.05 | < 0.05 | < 0.031 | < 0.01 | < 0.01 | 16.6 | 5.8 | 0.51 | 1.5 | 0.6 | 1 | 3.2 | < 0.1 | 7.8 | 10 | 9 | 2 | 31 | | |
| 7/28/1994 | 15:36 | 19.2 | 29 | 1 | 7.2 | 101 | 7.1 | 12 | 15 | < 0.25 | < 0.25 | 0.19 | 0.19 | 0.01 | < 0.01 | < 0.05 | < 0.05 | < 0.031 | < 0.01 | < 0.01 | 11.5 | 4 | 0.37 | 1.3 | 0.4 | 0.5 | 1.7 | < 0.1 | 5.6 | 10 | | 3 | 21 | 0.3 | < 0.1 |
| 7/28/1994 | 15:47 | 16.3 | 36 | 7 | 7.5 | 99 | 7 | 13 | 16 | < 0.25 | < 0.25 | 0.28 | 0.18 | 0.02 | < 0.01 | < 0.05 | < 0.05 | < 0.031 | 0.02 | < 0.01 | 14 | 4.9 | 0.44 | 1.5 | 0.5 | 0.8 | 2.2 | < 0.1 | 6.2 | 20 | < 3 | 9 | 24 | 0.7 | < 0.1 |
| 7/28/1994 | 15:52 | 13.4 | 43 | 9.5 | 6.1 | 76 | 6.8 | 17 | 21 | < 0.25 | < 0.25 | 0.19 | 0.19 | 0.01 | < 0.01 | < 0.05 | < 0.05 | < 0.031 | 0.02 | < 0.01 | 16.5 | 5.8 | 0.5 | 1.6 | 0.5 | 0.9 | 2.7 | < 0.1 | 7.3 | 10 | 8 | 33 | 30 | 0.8 | < 0.1 |
| 7/28/1994 | 15:53 | 13.4 | 43 | 9.5 | 6.1 | 76 | 6.8 | 17 | 21 | < 0.25 | < 0.25 | 0.18 | 0.18 | 0.02 | < 0.01 | < 0.05 | < 0.05 | < 0.031 | < 0.01 | < 0.01 | 16.5 | 5.8 | 0.49 | 1.6 | 0.5 | 0.8 | 2.7 | < 0.1 | 7.2 | 10 | 4 | 32 | 29 | | |

Notes: Green Highlight – Measurements that exceed the applicable water quality objective or standard

## Table 8.3-A3. USGS Water Quality Monitoring Profiles at Silver Lake Site 1

| Depth (m) | Temperature, water, degrees Celsius | | | |
|---|---|---|---|---|
| | Date | | | |
| | 4/27/1994 | 6/9/1994 | 7/28/1994 | 10/13/1994 |
| 0 | 6.6 | 12.3 | 18.9 | 10.8 |
| 1 | 6.5 | 12.2 | 18.7 | 10.9 |
| 2 | 6.5 | 11.9 | 18.6 | 10.9 |
| 3 | 6.4 | 11.3 | 18.4 | 10.9 |
| 4 | 6.4 | 11.1 | 18 | 10.9 |
| 5 | 6.4 | 10.8 | 17.7 | 10.9 |
| 6 | 6.3 | 10.7 | 17.2 | 10.9 |
| 7 | 6.3 | 10.5 | 16 | 10.9 |
| 8 | 6.2 | 10.2 | 15.1 | 10.9 |
| 9 | 6.2 | 10.1 | 14.3 | 10.9 |
| 10 | 6.2 | 9.8 | 13 | 10.9 |
| 11 | | 9 | 11.8 | 10.9 |
| 12 | | 8.5 | 11.3 | 10.9 |
| 13 | | 8.3 | 11 | 10.9 |
| 14 | | 8.3 | | 10.8 |

| Depth (m) | pH, water, unfiltered, field, standard units | | | |
|---|---|---|---|---|
| | Date | | | |
| | 4/27/1994 | 6/9/1994 | 7/28/1994 | 10/13/1994 |
| 0 | 6.9 | 6.5 | 6.5 | 8 |
| 1 | 6.9 | 6.5 | 6.4 | 7.7 |
| 2 | 6.9 | 6.6 | 6.6 | 7.7 |
| 3 | 7 | 6.7 | 6.6 | 7.6 |
| 4 | 7 | 6.7 | 6.6 | 7.6 |
| 5 | 7 | 6.8 | 6.7 | 7.6 |
| 6 | 7 | 6.8 | 6.7 | 7.5 |
| 7 | 7 | 6.9 | 6.6 | 7.5 |
| 8 | 7 | 6.9 | 6.6 | 7.5 |
| 9 | 7 | 6.9 | 6.6 | 7.4 |
| 10 | 7 | 6.9 | 6.6 | 7.4 |
| 11 | | 6.9 | 6.5 | 7.6 |
| 12 | | 6.9 | 6.5 | 7.4 |
| 13 | | 6.9 | 6.4 | 7.4 |
| 14 | | 6.8 | | 7.4 |

| Depth (m) | Dissolved oxygen, water, unfiltered, milligrams per liter | | | |
|---|---|---|---|---|
| | Date | | | |
| | 4/27/1994 | 6/9/1994 | 7/28/1994 | 10/13/1994 |
| 0 | 9.6 | 8.4 | 6.9 | 7.6 |
| 1 | 9.6 | 8.4 | 6.9 | 7.6 |
| 2 | 9.6 | 8.4 | 7 | 7.6 |
| 3 | 9.7 | 8.6 | 7 | 7.6 |
| 4 | 9.7 | 8.6 | 7 | 7.6 |
| 5 | 9.7 | 8.7 | 7 | 7.6 |
| 6 | 9.6 | 8.7 | 7.2 | 7.6 |
| 7 | 9.6 | 8.8 | 7.4 | 7.6 |
| 8 | 9.5 | 8.6 | 7.3 | 7.6 |
| 9 | 9.4 | 8.4 | 7.9 | 7.6 |
| 10 | 9.4 | 8.4 | 5.5 | 7.6 |
| 11 | | 8 | 3.9 | 7.4 |
| 12 | | 7.8 | 3.2 | 7.6 |
| 13 | | 7.7 | 2.8 | 7.6 |
| 14 | | 7.7 | | 7.5 |

| Depth (m) | Specific conductance, water, unfiltered, microsiemens per centimeter at 25°C | | | |
|---|---|---|---|---|
| | Date | | | |
| | 4/27/1994 | 6/9/1994 | 7/28/1994 | 10/13/1994 |
| 0 | 42 | 39 | 29 | 32 |
| 1 | 42 | 39 | 29 | 32 |
| 2 | 42 | 39 | 29 | 32 |
| 3 | 42 | 39 | 29 | 32 |
| 4 | 42 | 38 | 30 | 32 |
| 5 | 42 | 39 | 29 | 32 |
| 6 | 42 | 39 | 31 | 32 |
| 7 | 42 | 38 | 42 | 32 |
| 8 | 42 | 39 | 45 | 32 |
| 9 | 42 | 40 | 45 | 32 |
| 10 | 43 | 40 | 43 | 32 |
| 11 | | 42 | 43 | 32 |
| 12 | | 42 | 43 | 32 |
| 13 | | 42 | 44 | 32 |
| 14 | | 42 | | 32 |

Notes: Green Highlight – Measurements that exceed the applicable water quality objective or standard

## Table 8.3-A4. USGS Water Quality Monitoring Profiles at Silver Lake Site 2

| Depth (m) | Temperature, water, degrees Celsius | | | |
|---|---|---|---|---|
| | Date | | | |
| | 4/26/1994 | 6/9/1994 | 7/28/1994 | 10/13/1994 |
| 0 | 6.5 | 12.6 | 19.4 | 10.8 |
| 1 | 6.5 | 12.2 | 19.2 | 10.9 |
| 2 | 6.4 | 12 | 18.6 | 10.9 |
| 3 | 6.4 | 11.6 | 18.4 | 10.9 |
| 4 | 6.4 | 11.2 | 18.2 | 10.9 |
| 5 | 6.4 | 11 | 17.6 | 10.9 |
| 6 | 6.3 | 10.8 | 16.8 | 10.9 |
| 7 | 6.3 | 10.3 | 15.6 | 10.8 |
| 8 | 6.3 | 10 | 14.9 | 10.9 |
| 9 | 6.3 | 9.8 | 14.2 | 10.8 |
| 10 | 6.1 | 9.2 | 13.3 | 10.8 |
| 11 | | 9 | 13 | 10.5 |
| 12 | | 8.7 | | |
| 13 | | 8.2 | | |
| 14 | | 8.1 | | |

| Depth (m) | pH, water, unfiltered, field, standard units | | | |
|---|---|---|---|---|
| | Date | | | |
| | 4/26/1994 | 6/9/1994 | 7/28/1994 | 10/13/1994 |
| 0 | 6.9 | 7.3 | 7 | 7.3 |
| 1 | 6.9 | 7.3 | 7 | 7.2 |
| 2 | 6.9 | 7.3 | 7 | 7.2 |
| 3 | 6.9 | 7.3 | 7 | 7.2 |
| 4 | 6.9 | 7.3 | 7 | 7.2 |
| 5 | 7 | 7.3 | 7 | 7.2 |
| 6 | 7 | 7.3 | 7 | 7.2 |
| 7 | 7 | 7.3 | 6.9 | 7.2 |
| 8 | 7 | 7.3 | 6.8 | 7.2 |
| 9 | 7.1 | 7.2 | 6.8 | 7.2 |
| 10 | 7.1 | 7.2 | 6.7 | 7.2 |
| 11 | | 7.2 | 6.7 | 7.2 |
| 12 | | 7.1 | | |
| 13 | | 7.1 | | |
| 14 | | 7 | | |

| Depth (m) | Dissolved oxygen, water, unfiltered, milligrams per liter | | | |
|---|---|---|---|---|
| | Date | | | |
| | 4/26/1994 | 6/9/1994 | 7/28/1994 | 10/13/1994 |
| 0 | 9.7 | 8.5 | 7.1 | 7.7 |
| 1 | 9.7 | 8.4 | 7.1 | 7.7 |
| 2 | 9.7 | 8.4 | 7.1 | 7.7 |
| 3 | 9.8 | 8.4 | 7.1 | 7.7 |
| 4 | 9.7 | 8.5 | 6.8 | 7.7 |
| 5 | 9.7 | 8.5 | 7 | 7.6 |
| 6 | 9.7 | 8.6 | 7.1 | 7.6 |
| 7 | 9.8 | 8.7 | 7.3 | 7.6 |
| 8 | 9.8 | 8.4 | 7.1 | 7.6 |
| 9 | 9.8 | 8.4 | 6.8 | 7.6 |
| 10 | 9.8 | 8.1 | 5.8 | 7.6 |
| 11 | | 8 | 5.5 | 7.8 |
| 12 | | 8 | | |
| 13 | | 7.7 | | |
| 14 | | 7.6 | | |

| Depth (m) | Specific conductance, water, unfiltered, microsiemens per centimeter at 25°C | | | |
|---|---|---|---|---|
| | Date | | | |
| | 4/26/1994 | 6/9/1994 | 7/28/1994 | 10/13/1994 |
| 0 | 41 | 38 | 29 | 31 |
| 1 | 41 | 38 | 29 | 31 |
| 2 | 41 | 38 | 29 | 32 |
| 3 | 42 | 37 | 29 | 32 |
| 4 | 41 | 38 | 29 | 32 |
| 5 | 42 | 38 | 29 | 32 |
| 6 | 41 | 38 | 30 | 32 |
| 7 | 41 | 38 | 40 | 32 |
| 8 | 41 | 39 | 42 | 32 |
| 9 | 41 | 39 | 42 | 32 |
| 10 | 41 | 41 | 42 | 32 |
| 11 | | 41 | 42 | 31 |
| 12 | | 42 | | |
| 13 | | 42 | | |
| 14 | | 42 | | |

Notes: Green Highlight – Measurements that exceed the applicable water quality objective or standard

## Table 8.3-A5. USGS Water Quality Monitoring Profiles at Silver Lake Site 3

| Depth (m) | Temperature, water, degrees Celsius | | |
|---|---|---|---|
| | Date | | |
| | 4/27/1994 | 6/9/1994 | 7/28/1994 |
| 0 | 6.7 | 13.3 | 19.4 |
| 1 | 6.8 | 12.7 | 19.2 |
| 2 | 6.7 | 12 | 18.6 |
| 3 | 6.8 | 11.6 | 18.5 |
| 4 | 6.8 | 11.3 | 18.2 |
| 5 | 6.7 | 10.9 | 17.8 |
| 6 | 6.7 | 10.6 | 17.4 |
| 7 | 6.6 | 10.4 | 16.3 |
| 8 | 6.1 | 10.3 | 15 |
| 9 | | 10.3 | 13.7 |
| 10 | | 10.1 | 13.3 |
| 11 | | 9.7 | 13 |
| 12 | | 8.5 | |

| Depth (m) | pH, water, unfiltered, field, standard units | | |
|---|---|---|---|
| | Date | | |
| | 4/27/1994 | 6/9/1994 | 7/28/1994 |
| 0 | 6.6 | 7.7 | 7 |
| 1 | 6.8 | 7.6 | 7.1 |
| 2 | 6.8 | 7.5 | 7.1 |
| 3 | 6.8 | 7.5 | 7.1 |
| 4 | 6.8 | 7.5 | 7.1 |
| 5 | 6.8 | 7.5 | 7.1 |
| 6 | 6.9 | 7.5 | 7.1 |
| 7 | 6.9 | 7.5 | 7 |
| 8 | 7 | 7.5 | 6.9 |
| 9 | | 7.4 | 6.8 |
| 10 | | 7.3 | |
| 11 | | 7.3 | |
| 12 | | 7.2 | |

| Depth (m) | Dissolved oxygen, water, unfiltered, | | |
|---|---|---|---|
| | Date | | |
| | 4/27/1994 | 6/9/1994 | 7/28/1994 |
| 0 | 9.9 | 8.5 | 7.3 |
| 1 | 9.9 | 8.4 | 7.2 |
| 2 | 9.9 | 8.5 | 7.1 |
| 3 | 9.9 | 8.6 | 7.1 |
| 4 | 9.8 | 8.6 | 7.2 |
| 5 | 9.8 | 8.8 | 7.2 |
| 6 | 9.8 | 8.8 | 7.2 |
| 7 | 9.8 | 8.9 | 7.5 |
| 8 | 10 | 8.8 | 7.3 |
| 9 | | 8.7 | 6.3 |
| 10 | | 8.4 | |
| 11 | | 8.2 | |
| 12 | | 7.6 | |

| Depth (m) | Specific conductance, water, unfiltered, | | |
|---|---|---|---|
| | Date | | |
| | 4/27/1994 | 6/9/1994 | 7/28/1994 |
| 0 | 43 | 38 | 29 |
| 1 | 43 | 38 | 29 |
| 2 | 43 | 39 | 29 |
| 3 | 43 | 38 | 29 |
| 4 | 43 | 38 | 29 |
| 5 | 44 | 38 | 30 |
| 6 | 42 | 38 | 30 |
| 7 | 42 | 40 | 36 |
| 8 | 40 | 40 | 45 |
| 9 | | 40 | 44 |
| 10 | | 42 | |
| 11 | | 42 | |
| 12 | | 46 | |

Notes: Green Highlight – Measurements that exceed the applicable water quality objective or standard

**Table 8.3-A6. CEDEN Water Quality Monitoring in the Vicinity of the Rush Creek Project**

| Sample Date | Temperature (deg C) | Dissolved oxygen, water, unfiltered, milligrams per liter | pH, water, unfiltered, field, standard units | Specific conductance, water, unfiltered, microsiemens per centimeter at 25 degrees Celsius | General Parameters: AFDM_Algae, Particulate, grams per meter squared | Alkalinity, water, filtered, infection, milligrams per liter as calcium carbonate | Calcium, water, filtered, milligrams per liter | Chloride, water, filtered, milligrams per liter | Chlorophyll a, Particulate, milligrams per meter squared | Hardness, water, milligrams per liter as calcium carbonate | Magnesium, water, filtered, milligrams per liter | Nitrate + Nitrite as N, water, filtered, milligrams per liter | Nitrogen, Total, milligrams per liter | Organic carbon, water, filtered, milligrams per liter | Orthophosphate, water, filtered, milligrams per liter | Phosphorus Total, water, filtered, milligrams per liter as phosphorus | Silica Dissolved, water, filtered, milligrams per liter as SiO2 | Sulfate, water, filtered, milligrams per liter | Dissolved solids, water, filtered, sum of constituents, milligrams per liter | Suspended solids concentration, milligrams per liter | Trubidity, Total , NTU |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Applicable Water Quality Objective or Standard** | NS | Meet or exceed 5.0 for WARM; 7.0 for COLD | 6.5-9.0 | NS | NS | >20 | NS | NS | NS | NS | NS | 45 | 0.1/0.2 | NS | 0.02-0.07 | NS | NS | NS | 41-58 | NS | NS |
| **Rush Creek ~0.4mi below Walker Cr. (601PS0057) - Surface Water Ambient Monitoring Program (SWAMP Perennial Stream Surveys) - Statewide Perennial Streams Assessment 2011** | | | | | | | | | | | | | | | | | | | | | |
| 9/14/2011 | 12.6 | 8.4 | | | 1.97 | | | 0.65 | 3.75 | 17.3 | | 0.0067 | 0.108 | 0.84 | 0.0114 | 0.0249 | 10.8 | 4.21 | | 1.5 | 0.5 |
| **Rush Cr, above HWY 395 (601RSH002) - SWAMP RWB6 Monitoring** | | | | | | | | | | | | | | | | | | | | | |
| 7/26/2001 | 17.2 | 8.5 | 7.8 | 59.8 | | 34 | 7 | | 0.094 | 20 | 0.68 | 0.002 | 0.104 | | 0.001 | 0.006 | 3.1 | 2.7 | | | 0.34 |
| 8/4/2010 | | | | | 2.50 | | | | 2.59 | | | | | | | | | | | | |
| 8/10/2010 | 17.5 | 7.2 | 7.7 | 44.6 | | 28 | | 0.98 | | | | 0.005 | 0.098 | 0.79 | 0.003 | 0.009 | 9.04 | 2.7 | 28 | | 0.44 |
| **Rush Cr, bottomlands (601RSH001) - SWAMP RWB6 Monitoring** | | | | | | | | | | | | | | | | | | | | | |
| 8/2/2000 | 15 | 8.2 | 6.54 | 59 | | 44 | 75 | | 0.566 | 215 | 6.8 | 0.29 | | | | 0.06 | 5.8 | 5.4 | | | 0.35 |

Notes: Green Highlight – Measurements that exceed the applicable water quality objective or standard

**Table 8.3-A7. CEDEN *E. coli* and Fecal Coliform Monitoring in the Vicinity of the Rush Creek Project**

| Sample Date | E. coli (cfu/100mL) | Coliform, Fecal (cfu/100mL) |
|---|---|---|
| **Applicable Water Quality Objective or Standard** | NS | 100 |
| **Rush Ck at Test Station Rd (RUS.80) - Eastern Sierra Ambient Monitoring** | | |
| 9/26/2012 | 7 | 7 |
| 4/24/2013 | 2 | 2 |
| 5/30/2013 | 4 | 4 |
| 7/7/2013 | 8 | 10 |
| 7/30/2013 | 30 | 43 |
| 9/17/2013 | 6 | 6 |
| **Rush Ck at Hwy 395 (RUS.70) - Eastern Sierra Ambient Monitoring** | | |
| 9/26/2012 | 9 | 37 |
| 7/7/2013 | 10 | 11 |
| 7/30/2013 | 4 | 6 |
| 9/17/2013 | 5 | 6 |
| 10/17/2013 | 1 | 1 |
| **Rush Ck at USGS gauge above Grant Reservoir (RUS.50) - Eastern Sierra Ambient Monitoring** | | |
| 4/24/2013 | 1 | 1 |
| 5/30/2013 | 3 | 3 |
| 7/7/2013 | 3 | 4 |
| 7/30/2013 | 9 | 10 |
| 9/17/2013 | 6 | 6 |
| 10/17/2013 | 2 | 2 |

Notes: Green Highlight – Measurements that exceed the applicable water quality objective or standard

## Table 8.3-A8. Selected Water Quality Parameters for the Three Rush Creek Project Reservoirs, Measured between July 1986 and August 1987

| Reservoir | Temperature (°C, range) | pH (range) | Dissolved Oxygen (% saturation, range) | Electrical Conductivity (μScM, range) | Calcium (CA) (μEg/L, range) | Bicarbonate (μEg/L, range) |
|---|---|---|---|---|---|---|
| Waugh Lake | 6.2-15.7 | 6.2-7.5 | 22*-112 | 4.7-10.1 | 21-28.8 | 19-50 |
| Gem Lake | 0.3-16.4 | 6.4-7.5 | 25*-113 | 7.5-17.3 | 39.6-83.5 | 46-95 |
| Agnew Lake | 4.6-15.5 | 6.0-7.6 | 3*-120 | 16.1-219.1** | 87.7-1,320.0** | 101-2,034** |

*Source: Lund 1988; This table is a reproduction of Table 2 of FERC Environmental Assessment of Rush Creek, 1992 (FERC 1992)*

Notes: Green Highlight – Measurements that exceed the applicable water quality objective or standard

* Low dissolved levels observed at deepest lake measurement during winter and late summer

** High observed during August 1987

## Table 8.3-A9. Location of lakes and stream samples in this study (Lund 1988). (Originally Table 1)

| DRAINAGE | LAKE | ELEVATION FT | LOCATION |
|---|---|---|---|
| Bishop Creek | South | 9,751 | 118°34'W 37°10'N |
| | Sabrina | 9,132 | 118°37'W 37°12'N |
| | Intake #2 | 8,099 | 118°35'W 37°15'N |
| Bishop Creek | Stream Tansect | | |
| Rush Creek | Waugh | 9,410 | 119°12'W 37°45'N |
| | Gem | 9,048 | 119°09'W 37°45'N |
| | Agnew | 8,492 | 119°08'W 37°45'N |
| Lee Vining Creek | Saddlebag | 10,090 | 119°16'W 37°58'N |
| | Tioga | 9,653 | 119°15'W 37°56'N |
| | Ellery | 9,499 | 119°14'W 37°56'N |
| Mill Creek | Lundy | 7,803 | 119°14'W 38°02'N |

## Table 8.3-A10. Field data for Agnew for five sampling dates in 1986 and 1987 (Lund 1988). (Originally Tables 3 and 4)

| DATE | DEPTH M | TEMP C | PH | DISSOLVED OXYGEN MG/L | DISSOLVED OXYGEN % SAT |
|---|---|---|---|---|---|
| 07/08/86 | 0.5 | 11.66 | 6.76 | 8.53 | 106.3 |
| | 3.5 | 11.41 | 7.09 | 8.42 | 104.4 |
| | 6.5 | 11.25 | 7.07 | 8.39 | 103.7 |
| | 9.5 | 11.05 | 7.12 | 8.39 | 103.2 |
| | 12.5 | 10.82 | 6.92 | 8.32 | 101.8 |
| | 15.5 | 10.76 | 6.89 | 8.29 | 101.3 |
| | 18.5 | 10.70 | 6.74 | 8.27 | 101.0 |
| | 21.5 | 4.58 | 6.06 | 3.71 | 39.6 |
| | 23.5 | 4.63 | 6.15 | 3.35 | 35.8 |
| 08/26/86 | 0.5 | 15.47 | 6.45 | 7.31 | 99.0 |
| | 3.5 | 15.16 | 6.80 | 7.27 | 97.8 |
| | 6.5 | 14.80 | 7.01 | 7.35 | 98.1 |
| | 9.5 | 14.56 | 6.88 | 7.45 | 99.0 |
| | 12.5 | 12.71 | 6.41 | 8.15 | 104.0 |
| | 15.5 | 11.85 | 6.30 | 7.46 | 93.4 |
| | 18.5 | 10.63 | 6.18 | 6.29 | 76.7 |
| | 21.5 | 7.51 | 5.95 | 3.68 | 41.9 |
| | 23.5 | 5.50 | 6.03 | 0.54 | 5 9 |
| | 24.3 | 5.29 | 6.15 | 0.27 | 2.9 |
| 10/08/86 | 0.5 | 7.77 | 6.87 | 8.77 | 100.4 |
| | 3.5 | 7.39 | 6.85 | 8.86 | 100.6 |
| | 6.5 | 7.14 | 6.84 | 8.47 | 95.7 |
| | 9.5 | 7.07 | 6.84 | 8.37 | 94.4 |
| | 12.5 | 7.03 | 6.84 | 8.27 | 93.2 |
| | 15.5 | 7.00 | 6.80 | 8.22 | 92.6 |
| | 18.5 | 6.96 | 6.77 | 8.18 | 92.0 |
| | 21.5 | 6.95 | 6.74 | 8.12 | 91.3 |
| | 23.6 | 6.95 | 6.69 | 8.01 | 90.1 |

| DATE | DEPTH M | TEMP C | PH | DISSOLVED OXYGEN MG/L | DISSOLVED OXYGEN % SAT |
|---|---|---|---|---|---|
| 06/29/87 | 0.0 | 14.9 | --* | 7.59 | 105 |
| | 0.5 | 14.7 | -- | 7.51 | 103 |
| | 1.5 | 14.6 | -- | 7.61 | 104 |
| | 2.5 | 14.6 | -- | 7.50 | 103 |
| | 3.5 | 14.5 | -- | 7.48 | 102 |
| | 4.5 | 14.5 | -- | 7.53 | 103 |
| | 5.5 | 13.7 | -- | 7.58 | 102 |
| | 6.5 | 12.5 | -- | 8.17 | 107 |
| | 7.5 | 11.8 | -- | 8.45 | 108 |
| | 8.5 | 11.4 | -- | 8.66 | 110 |
| | 9.5 | 9.1 | -- | 9.98 | 120 |
| 08/25/87 | 0.5 | 14.97 | 6.98 | 5.25 | 72 |
| | 2.5 | 14.57 | 7.12 | 4.30 | 59 |
| | 4.5 | 14.21 | 7.15 | 3.73 | 51 |
| | 6.5 | 14.04 | 7.21 | 3.35 | 45 |
| | 8.5 | 13.96 | 7.24 | 3.06 | 41 |
| | 10.5 | 13.82 | 7.25 | 2.82 | 38 |
| | 12.5 | 10.29 | 6.94 | 4.32 | 53 |
| | 14.5 | 7.59 | 6.75 | 5.56 | 64 |
| | 16.5 | 6.42 | 6.65 | 5.04 | 56 |
| | 18.5 | 5.66 | 6.57 | 4.73 | 52 |
| | 20.5 | 5.19 | 6.49 | 4.50 | 47 |
| | 22.5 | 4.98 | 6.42 | 3.91 | 42 |
| | 24.4 | 4.89 | 6.40 | 3.46 | 37 |

* Field instrument not operational.

## Table 8.3-A11. Field data for Gem for six sampling dates in 1986 and 1987 (Lund 1988). (Originally Tables 7 and 8)

| DATE | DEPTH M | TEMP C | PH | DISSOLVED OXYGEN MG/L | DISSOLVED OXYGEN % SAT |
|---|---|---|---|---|---|
| 07/08/86 | 0.5 | 11.67 | 6.78 | 8.66 | 100.3 |
| | 3.5 | 10.79 | 6.90 | 8.67 | 107.4 |
| | 6.5 | 10.60 | 7.05 | 8.73 | 107.7 |
| | 9.5 | 10.19 | 7.01 | 8.91 | 108.9 |
| | 12.5 | 9.53 | 6.99 | 9.14 | 110.1 |
| | 15.5 | 8.11 | 7.04 | 9.65 | 112.7 |
| | 18.5 | 6.31 | 7.04 | 9.70 | 108.9 |
| | 21.5 | 5.02 | 6.93 | 9.47 | 103.4 |
| | 24.5 | 4.42 | 6.88 | 9.09 | 98.0 |
| | 28.4 | 4.08 | 6.82 | 8.90 | 95.2 |
| 08/26/86 | 0.5 | 16.44 | 6.45 | 7.62 | 106.8 |
| | 3.5 | 15.99 | 6.59 | 7.42 | 103.0 |
| | 6.5 | 15.92 | 6.64 | 7.34 | 101.7 |
| | 9.5 | 15.82 | 6.69 | 7.34 | 101.5 |
| | 12.5 | 15.64 | 6.70 | 7.38 | 101.6 |
| | 15.5 | 13.53 | 6.74 | 8.30 | 109.1 |
| | 18.5 | 6.67 | 6.77 | 9.72 | 110.0 |
| | 21.5 | 5.39 | 6.75 | 9.66 | 106.3 |
| | 24.5 | 4.77 | 6.68 | 9.26 | 100.6 |
| | 29.1 | 4.16 | 6.63 | 8.62 | 92.4 |
| 10/08/86 | 0.5 | 8.89 | 7.15 | 8.25 | 98.0 |
| | 1.0 | 8.88 | 7.15 | 8.20 | 97.4 |
| | 1.5 | 8.88 | 7.18 | 8.19 | 97.3 |
| | 2.0 | 8.87 | 7.17 | 8.20 | 97.4 |
| | 2.5 | 8.86 | 7.14 | 8.15 | 96.8 |
| | 3.0 | 8.82 | 7.13 | 8.18 | 97.0 |
| | 3.5 | 8.77 | 7.14 | 8.14 | 96.5 |
| | 4.0 | 8.74 | 7.13 | 8.16 | 96.6 |
| | 4.5 | 8.73 | 7.11 | 8.16 | 96.6 |
| | 5.0 | 8.71 | 7.10 | 8.06 | 95.4 |
| | 5.5 | 8.71 | 7.10 | 8.06 | 95.4 |
| | 6.0 | 8.67 | 7.10 | 8.14 | 96.3 |
| | 6.5 | 8.65 | 7.10 | 8.09 | 95.6 |
| | 7.0 | 8.64 | 7.09 | 8.15 | 96.3 |
| | 7.5 | 8.61 | 7.10 | 8.17 | 96.5 |
| | 8.0 | 8.59 | 7.09 | 8.07 | 95.3 |
| | 8.5 | 8.57 | 7.08 | 8.19 | 96.6 |
| | 9.0 | 8.53 | 7.08 | 8.20 | 96.7 |
| | 9.5 | 8.51 | 7.07 | 8.16 | 96.2 |
| | 10.0 | 8.48 | 7.06 | 8.18 | 96.3 |
| | 10.5 | 8.45 | 7.06 | 8.19 | 96.4 |
| | 11.0 | 8.38 | 7.05 | 8.11 | 95.3 |
| | 11.5 | 8.33 | 7.05 | 8.20 | 96.2 |
| | 12.0 | 8.28 | 7.04 | 8.22 | 96.4 |
| | 15.0 | 8.00 | 7.02 | 8.42 | 98.1 |
| | 18.0 | 7.05 | 6.95 | 8.98 | 102.5 |
| | 21.0 | 5.14 | 6.89 | 9.51 | 104.1 |
| | 24.0 | 4.25 | 6.85 | 9.38 | 100.7 |
| | 27.0 | 3.92 | 6.80 | 8.84 | 94.2 |
| | 27.9 | 3.88 | 6.76 | 8.14 | 86.7 |

| DATE | DEPTH M | TEMP C | PH | DISSOLVED OXYGEN MG/L | DISSOLVED OXYGEN % SAT |
|---|---|---|---|---|---|
| 03/25/87 | 0.5 | 0.40 | --* | 9.20 | 88 |
| | 1.0 | 0.30 | -- | 9.40 | 90 |
| | 4.0 | 2.30 | -- | 8.60 | 88 |
| | 7.0 | 2.60 | -- | 8.40 | 86 |
| | 10.0 | 2.90 | -- | 8.00 | 83 |
| | 13.0 | 3.30 | -- | 7.70 | 81 |
| | 16.0 | 3.50 | -- | 7.50 | 79 |
| | 19.0 | 3.60 | -- | 7.40 | 78 |
| | 22.0 | 3.60 | -- | 7.30 | 77 |
| | 25.0 | 3.70 | -- | 7.00 | 74 |
| | 28.0 | 3.70 | -- | 6.80 | 72 |
| | 31.0 | 3.70 | -- | 6.30 | 67 |
| | 34.0 | 3.70 | -- | 6.00 | 64 |
| | 37.0 | 3.70 | -- | 4.10 | 44 |
| | 40.0 | 3.70 | -- | 3.90 | 41 |
| | 43.0 | 3.70 | -- | 3.20 | 34 |
| | 46.0 | 3.70 | -- | 2.90 | 31 |
| 06/29/87 | 0.0 | 15.10 | -- | 6.98 | 99 |
| | 0.5 | 15.00 | -- | 6.85 | 97 |
| | 4.5 | 14.30 | -- | 6.94 | 97 |
| | 8.5 | 13.30 | -- | 7.61 | 103 |
| | 12.5 | 9.60 | -- | 8.94 | 111 |
| | 16.5 | 6.80 | -- | 9.36 | 108 |
| | 20.5 | 5.00 | -- | 8.42 | 93 |
| | 24.5 | 4.30 | -- | 7.87 | 85 |
| | 28.5 | 4.10 | -- | 7.42 | 80 |
| | 32.5 | 4.00 | -- | 7.32 | 78 |
| | 35.0 | 4.00 | -- | 7.26 | 78 |
| 08/25/87 | 0.5 | 15.69 | 7 16 | 2.51 | 36 |
| | 2.5 | 15.39 | 7.12 | 1.95 | 28 |
| | 4.5 | 15.23 | 7.16 | 1.94 | 28 |
| | 6.5 | 15.16 | 7.20 | 1.84 | 26 |
| | 8.5 | 15.10 | 7.22 | 1.74 | 25 |
| | 10.5 | 11.27 | 7.40 | 6.27 | 81 |
| | 12.5 | 7.82 | 7.44 | 6.12 | 73 |
| | 14.5 | 6.22 | 7.46 | 6.26 | 71 |
| | 16.5 | 5.26 | 7.40 | 6.35 | 70 |
| | 18.5 | 4.66 | 7.34 | 6.24 | 68 |
| | 20.5 | 4.32 | 7.26 | 6.68 | 72 |
| | 22.5 | 4.02 | 7.22 | 5.19 | 56 |
| | 24.5 | 3.94 | 7.04 | 5.66 | 61 |
| | 26.5 | 3.92 | 6.97 | 4.82 | 51 |
| | 28 5 | 3.86 | 6.90 | 4.70 | 50 |

* Field instrument not operational.

## Table 8.3-A12. Field data for Waugh for five sampling dates in 1986 and 1987 (Lund 1988). (Originally Tables 21 & 22)

| DATE | DEPTH M | TEMP C | PH | DISSOLVED OXYGEN MG/L | DISSOLVED OXYGEN % SAT |
|---|---|---|---|---|---|
| 07/08/86 | 0.5 | 11.23 | 6.22 | 8.58 | 109 7 |
| | 3.5 | 11.08 | 6.54 | 8.52 | 108.6 |
| | 6.5 | 7.06 | 6.72 | 9.44 | 110.2 |
| 08/26/86 | 0.5 | 15.70 | 6.42 | 7.51 | 105.9 |
| | 2.5 | 15.69 | 6.76 | 7.42 | 104.6 |
| | 4.5 | 15.07 | 6.71 | 8.07 | 112.2 |
| | 6.5 | 14.39 | 6.71 | 8.16 | 111.8 |
| 10/08/86 | 0.5 | 6.41 | 7.49 | 8.65 | 99.6 |
| | 1.0 | 6.30 | 7 30 | 8.67 | 99.6 |
| | 1.5 | 6.28 | 7.24 | 8.62 | 99.0 |
| | 2.0 | 6.26 | 7.24 | 8.55 | 98.1 |
| | 2.5 | 6.21 | 7.24 | 8.51 | 97.5 |
| | 3.0 | 6.21 | 7.25 | 8.52 | 97.7 |
| | 3.5 | 6.19 | 7.23 | 8.52 | 97.6 |
| | 4.0 | 6.22 | 7.25 | 8.44 | 96.8 |
| | 4.5 | 6.21 | 7.23 | 8.45 | 96.9 |
| | 5.0 | 6.21 | 7.24 | 8.46 | 97.0 |
| | 5.5 | 6.21 | 7.24 | 8.46 | 97.0 |
| | 6.0 | 6.22 | 7.23 | 8.44 | 96.8 |
| | 6.2 | 6.18 | 7.22 | 8.47 | 97.0 |

| DATE | DEPTH M | TEMP C | PH | DISSOLVED OXYGEN MG/L | DISSOLVED OXYGEN % SAT |
|---|---|---|---|---|---|
| 06/29/87 | 0.0 | 14.7 | --* | 6.83 | 97 |
| | 0.5 | 14.4 | -- | 6.83 | 96 |
| | 2.5 | 14.0 | -- | 6.76 | 95 |
| | 4.5 | 12.6 | -- | 7.30 | 99 |
| | 6.5 | 11.0 | -- | 6.16 | 80 |
| | 8.5 | 9.8 | -- | 4.90 | 62 |
| | 10.5 | 9.8 | -- | 3.67 | 47 |
| | 12.5 | 9.7 | -- | 2.90 | 37 |
| | 14.5 | 9.7 | -- | 3.02 | 38 |
| | 16.5 | 9.7 | -- | 3.36 | 42 |
| | 18.5 | 9.7 | -- | 3.78 | 48 |
| | 20.5 | 9.7 | -- | 4.02 | 51 |
| | 22.5 | 9.7 | -- | 4.09 | 52 |
| | 9.6 | 9.7 | -- | 4.13 | 52 |
| | 26.5 | 9.7 | -- | 4.14 | 52 |
| | 28.5 | 9.8 | -- | 4.13 | 52 |
| 08/25/87 | 0.5 | 15.18 | 7.42 | 1.80 | 26 |
| | 2.5 | 15.13 | 7.31 | 1.66 | 24 |
| | 4.5 | 15.09 | 7.36 | 1.74 | 25 |
| | 6.5 | 15.04 | 7.24 | 1.67 | 24 |
| | 8.5 | 15.00 | 7.24 | 1.64 | 23 |
| | 10.5 | 14.97 | 7.23 | 1.61 | 23 |
| | 11.0 | 14.97 | 7.22 | 1.57 | 22 |

* Field instrument not operational.

## Table 8.3-A13. Selected laboratory data for Agnew for five sampling dates in 1986 and 1987 (Lund 1988). (Originally Tables 23 and 24)

| DATE | DEPTH M | PH | ANC uEq/L | ELEC COND uS/cm | DISS INORG C uEq/L | DISS ORG C ppm(C) |
|---|---|---|---|---|---|---|
| 07/08/86 | [illegible] | 6.71 | 109 | 16.1 | 197 | 0.64 |
| | 5.5 | 6.71 | 110 | 16.2 | 180 | 0.76 |
| | 10.5 | 6.72 | 101 | 15.2 | 197 | 0.64 |
| | 15.5 | 6.63 | 118 | 16.6 | 209 | 0.47 |
| | 20.5 | 6.63 | 129 | 17.7 | 226 | 0.53 |
| 08/26/86 | 0.5 | 6.83 | 233 | 30.3 | 307 | 0.64 |
| | 6.5 | 6.88 | 233 | 30.6 | 307 | 0.65 |
| | 12.5 | 6.77 | 245 | 31.1 | 307 | 0.68 |
| | 18.5 | 6.12 | 311 | 43.7 | 680 | 0.73 |
| | 24.0 | 6.17 | 539 | 177.6 | >538 | 0.77 |
| 10/08/86 | 0.5 | 7.08 | 463 | 61.9 | 556 | 0.68 |
| | 6.0 | 7.00 | 470 | 63.2 | 523 | 0.72 |
| | 11.5 | 7.02 | 476 | 58.8 | 726 | 0.69 |
| | 17.0 | 6.94 | 481 | 65.0 | 540 | 0.47 |
| | 22.5 | 6.93 | 479 | 64.1 | 512 | 2.40 |

| DATE | DEPTH M | PH | ANC uEq/L | ELEC COND uS/cm | DISS INORG C uEq/L | DISS ORG C ppm(C) |
|---|---|---|---|---|---|---|
| 06/29/87 | 0.5 | 7.55 | 1068 | 129.6 | 880 | 0.82 |
| | 2.5 | 7.57 | 1071 | 131.5 | 939 | 0.71 |
| | 4.5 | 7.57 | 1073 | 131.9 | 911 | 0.60 |
| | 6.5 | 7.46 | 1069 | 132.6 | 945 | 0.68 |
| | 8.5 | 7.11 | 1114 | 138.0 | 961 | 0.66 |
| 08/25/87 | 0.5 | 7.48 | 971 | 136.5 | 827 | 0.38 |
| | 6.0 | 7.40 | 966 | 136.9 | 847 | 0.45 |
| | 12.0 | 6.93 | 1111 | 153.3 | 1029 | 0.36 |
| | 18.0 | 6.61 | 1578 | 219.1 | 1361 | nd |
| | 24.0 | 6.44 | 2034 | > | 1579 | 0.07 |

## Table 8.3-A14. Selected laboratory data for Gem for five sampling dates in 1986 and 1987 (Lund 1988). (Originally Tables 27 and 28)

| DATE | DEPTH M | PH | ANC uEq/L | ELEC COND uS/cm | DISS INORG C uEq/L | DISS ORG C ppm(C) |
|---|---|---|---|---|---|---|
| 07/08/86 | 0.5 | 6.86 | 61 | 8.5 | 75 | 0.47 |
| | 7.5 | 6.95 | 50 | 8.9 | 77 | 0.47 |
| | 14.5 | 6.97 | 55 | 9.1 | 82 | 0.58 |
| | 21.5 | 6.78 | 74 | 11.5 | 118 | 0.53 |
| | 28.5 | 6.60 | 82 | 13.1 | 156 | 0.58 |
| 08/26/86 | 0.5 | 6.82 | 57 | 7.7 | 64 | 0.54 |
| | 7.5 | 6.88 | 63 | 7.5 | 57 | 0.42 |
| | 14.5 | 6.83 | 56 | 7.5 | 57 | 0.51 |
| | 21.5 | 6.79 | 82 | 12.0 | 91 | 0.83 |
| | 28.5 | 6.55 | 88 | 13.4 | 127 | 0.77 |
| 10/08/86 | 0.5 | 6.85 | 46 | 9.0 | 28 | 0.39 |
| | 7.0 | 6.91 | 53 | 8.7 | 82 | 0.37 |
| | 13.5 | 6.89 | 54 | 8.9 | 88 | 0.46 |
| | 20.0 | 6.81 | 73 | 11.6 | 121 | 0.53 |
| | 26.5 | 6.78 | 52 | 13.4 | 148 | 0.50 |

| DATE | DEPTH M | PH | ANC uEq/L | ELEC COND uS/cm | DISS INORG C uEq/L | DISS ORG C ppm(C) |
|---|---|---|---|---|---|---|
| 03/25/87 | 0.5 | 6.71 | 99 | 12.7 | 113 | |
| | 8.0 | 6.65 | 86 | 12.7 | 123 | 0.37 |
| | 15.5 | 6.54 | 92 | 12.0 | 144 | 0.43 |
| | 23.0 | 6.57 | 83 | 12.7 | 141 | 0.32 |
| | 37.0 | 6.47 | 97 | 14.1 | 195 | 0.22 |
| 06/29/87 | 0.5 | 6.88 | 73 | 11.7 | 92 | 0.64 |
| | 8.5 | 6.89 | 66 | 11.5 | 80 | 0.96 |
| | 16.5 | 6.71 | 81 | 13.6 | 122 | 0.51 |
| | 24.5 | 6.30 | 77 | 14.6 | 173 | 0.40 |
| | 32.5 | 6.37 | 95 | 17.3 | 229 | 0.21 |
| 08/25/87 | 0.5 | 7.23 | 77 | 11.9 | 83 | 0.82 |
| | 7.0 | 7.13 | 87 | 10.3 | 92 | 1.31 |
| | 14.0 | 7.18 | 69 | 12.9 | 84 | 0.74 |
| | 21.0 | 6.66 | 88 | 14.5 | 133 | 0.35 |
| | 28.0 | 6.53 | 88 | 15.2 | 205 | 0.33 |

32

## Table 8.3-A15. Selected laboratory data for Waugh for five sampling dates in 1986 and 1987 (Lund 1988). (Originally Tables 41 and 42)

| DATE | DEPTH M | PH | ANC uEq/L | ELEC COND uS/cm | DISS INORG C uEq/L | DISS ORG C ppm(C) |
|---|---|---|---|---|---|---|
| 07/08/86 | 0.5 | 6.56 | 22 | 5.2 | 49 | 0.30 |
| | 1.5 | 6.64 | 27 | 5.4 | 42 | 0.41 |
| | 2.5 | 6.52 | 21 | 5.0 | 44 | 0.30 |
| | 3.5 | 6.67 | 19 | 5.8 | 44 | 0.30 |
| | 5.0 | 6.57 | 20 | 5.5 | 44 | 0.30 |
| 08/26/86 | 0.5 | 6.45 | 22 | 4.7 | 57 | 0.32 |
| | 2.5 | 6.50 | 28 | 4.9 | 44 | 0.25 |
| | 4.5 | 6.39 | 22 | 4.9 | 39 | 0.32 |
| | 6.0 | 6.48 | 24 | 4.9 | 35 | 0.15 |
| 10/08/86 | 0.5 | 6.59 | 22 | 5.5 | 58 | 0.20 |
| | 2.0 | 6.60 | 22 | 5.6 | 60 | 0.93 |
| | 3.5 | 6.58 | 26 | 5.0 | 11 | 0.24 |
| | 5.0 | 6.59 | 23 | 5.4 | 8 | 0.29 |
| | 6.0 | 6.60 | 28 | 4.9 | 55 | nd |

| DATE | DEPTH M | PH | ANC uEq/L | ELEC COND uS/cm | DISS INORG C uEq/L | DISS ORG C ppm(C) |
|---|---|---|---|---|---|---|
| 06/29/87 | 0.5 | 6.61 | 35 | 10.1 | 54 | 0.83 |
| | 3.5 | 6.41 | 28 | 7.7 | 56 | 0.58 |
| | 6.5 | 6.37 | 23 | 7.2 | 47 | 0.46 |
| | 9.5 | 6.39 | 26 | 7.3 | 56 | 0.52 |
| | 12.5 | 6.33 | 35 | 7.1 | 64 | 0.47 |
| 08/25/87 | 0.5 | 6.70 | 50 | 5.6 | 40 | 0.43 |
| | 3.0 | 6.68 | 27 | 5.0 | 37 | 1.07 |
| | 5.5 | 6.66 | 20 | 5.8 | 41 | 0.46 |
| | 8.0 | 6.79 | 19 | 6.0 | 38 | 0.70 |
| | 10.5 | 6.68 | 45 | 6.0 | 41 | 0.36 |

**Table 8.3-A16. Cation and anion data for Waugh for five sampling dates in 1986 and 1987 (Lund 1988). (Originally Tables 43 and 44)**

| DATE | DEPTH M | CA | MG | NA | K | ANC | CL | $NO_3$-N | $SO_4$-S |
|---|---|---|---|---|---|---|---|---|---|
| | | uEq/L | | | | | | | |
| 07/08/86 | 0.5 | 87.65 | 17.93 | 29.78 | 7.47 | 109 | 13.75 | 0.79 | 13.06 |
| | 5.5 | 88.25 | 18.10 | 28.52 | 7.11 | 110 | 12.90 | 0.79 | 13.19 |
| | 10.5 | 88.20 | 18.18 | 28.70 | 7.03 | 101 | 14.31 | 0.79 | 14.75 |
| | 15.5 | 93.90 | 19.33 | 31.39 | 7.14 | 118 | 18.06 | 0.86 | 13.56 |
| | 20.5 | 97.40 | 21.80 | 33.17 | 7.21 | 129 | 18.14 | 0.93 | 13.31 |
| 08/26/86 | 0.5 | 182.00 | 41.13 | 57.91 | 11.38 | 233 | 42.59 | nd | 15.31 |
| | 6.5 | 187.00 | 41.63 | 58.17 | 11.59 | 233 | 42.42 | nd | 15.44 |
| | 12.5 | 189.00 | 42.61 | 59.09 | 11.36 | 245 | 42.59 | nd | 15.75 |
| | 18.5 | 241.00 | 58.90 | 97.48 | 15.19 | 311 | 86.45 | nd | 16.75 |
| 10/08/86 | 0.5 | 366.00 | 91.97 | 141.13 | 20.46 | 463 | 126.31 | nd | 29.56 |
| | 6.0 | 365.00 | 91.56 | 140.22 | 20.08 | 470 | 121.15 | nd | 20.63 |
| | 11.5 | 365.50 | 91.48 | 141.48 | 20.61 | 476 | 128.59 | nd | 19.94 |
| | 17.0 | 374.00 | 92.14 | 143.35 | 20.87 | 481 | 131.94 | nd | 27.50 |
| | 22.5 | 371.50 | 92.46 | 146.26 | 20.90 | 479 | 134.14 | nd | 26.81 |
| 06/29/87 | 0.5 | 810.0 | 203.3 | 370.4 | 17.3 | 1068 | 332.0 | nd | 42.0 |
| | 2.5 | 800.0 | 204.1 | 362.2 | 16.7 | 1071 | 231.0 | nd | 30.9 |
| | 4.5 | 810.0 | 204.1 | 369.1 | 17.9 | 1073 | 328.0 | nd | 41.6 |
| | 6.5 | 810.0 | 204.1 | 371.7 | 18.1 | 1069 | 336.0 | nd | 41.8 |
| | 8.5 | 840.0 | 210.7 | 389.6 | 18.7 | 1114 | 347.0 | nd | 42.2 |
| 08/2[illegible]/87 | 0.5 | 700.0 | 184.4 | 420.0 | 10.1 | 971 | 313.0 | nd | 40.3 |
| | 6.0 | 705.0 | 186.8 | 419.6 | 9.9 | 966 | 311.0 | nd | 38.7 |
| | 12.0 | 780.0 | 208.2 | 491.3 | 12.6 | 1111 | 370.0 | nd | 40.7 |
| | 18.0 | 1025.0 | 275.7 | 695.7 | 17.8 | 1578 | 547.0 | nd | 48.5 |
| | 24.0 | 1320.0 | 363.0 | 991.3 | 25.5 | 2034 | 710.0 | 0.6 | 49.7 |

## Table 8.3-A17. Cation and anion data for Gem for five sampling dates in 1986 and 1987 (Lund 1988). (Originally Tables 47 and 48)

| DATE | DEPTH M | CA | MG | NA | K | ANC | CL | $NO_3$-N | $SO_4$-S |
|---|---|---|---|---|---|---|---|---|---|
| | | uEq/L | | | | | | | |
| 07/08/86 | 0.5 | 46.70 | 7.24 | 14.57 | 3.71 | 61 | 3.38 | 1.29 | 11.63 |
| | 7.5 | 46.70 | 7.24 | 14.57 | 4.53 | 50 | 3.41 | 1.14 | 10.94 |
| | 14.5 | 48.10 | 7.90 | 15.65 | 3.71 | 55 | 3.86 | 1.14 | 11.13 |
| | 21.5 | 63.50 | 10.69 | 20.26 | 4.68 | 74 | 6.39 | 1.43 | 13.06 |
| | 28.5 | 69.55 | 14.64 | 23.22 | 4.99 | 82 | 7.94 | 2.79 | 14.75 |
| 08/26/86 | 0.5 | 39.60 | 7.57 | 12.96 | 3.71 | 57 | 2.42 | nd | 10.44 |
| | 7.5 | 41.65 | 6.93 | 13.17 | 5.24 | 63 | 2.14 | nd | 10.19 |
| | 14.5 | 40.55 | 6.42 | 13.00 | 3.48 | 56 | 2.25 | nd | 10.50 |
| | 21.5 | 70.15 | 11.35 | 21.65 | 4.86 | 82 | 7.30 | 0.86 | 13.75 |
| | 28.5 | 72.25 | 12.67 | 24.43 | 4.73 | 88 | 9.21 | 2.57 | 15.25 |
| 10/08/86 | 0.5 | 49.70 | 6.99 | 14.65 | 3.48 | 46 | 3.24 | nd | 10.75 |
| | 7.0 | 48.90 | 7.07 | 14.39 | 3.91 | 53 | 3.24 | nd | 11.06 |
| | 13.5 | 49.65 | 6.91 | 14.70 | 3.89 | 54 | 3.38 | nd | 11.00 |
| | 20.0 | 64.55 | 11.93 | 20.22 | 4.48 | 73 | 6.76 | 0.71 | 13.19 |
| | 26.5 | 71.95 | 12.26 | 22.30 | 4.45 | 52 | 8.37 | 1.21 | 14.38 |

| DATE | DEPTH M | CA | MG | NA | K | ANC | CL | $NO_3$-N | $SO_4$-S |
|---|---|---|---|---|---|---|---|---|---|
| | | uEq/L | | | | | | | |
| 03/25/87 | 0.5 | 76.5 | 15.1 | 36.5 | 2.8 | 99 | 13.6 | 1.8 | 14.9 |
| | 8.0 | 75.5 | 14.2 | 38.4 | 2.7 | 86 | 11.2 | 1.9 | 14.4 |
| | 15.5 | 74.0 | 13.3 | 33.3 | 3.9 | 92 | 11.0 | 2.3 | 14.1 |
| | 23.0 | 77.0 | 13.8 | 38.1 | 4.2 | 83 | 12.0 | 2.6 | 14.4 |
| | 37.0 | 82.0 | 15.3 | 41.2 | 3.7 | 97 | 13.8 | 2.9 | 14.9 |
| 06/29/87 | 0.5 | 59.5 | 11.9 | 25.0 | 6.8 | 73 | 8.0 | 0.4 | 14.5 |
| | 8.5 | 58.5 | 11.9 | 25.6 | 7.1 | 66 | 7.3 | 0.4 | 14.5 |
| | 16.5 | 69.5 | 14.5 | 20.4 | 5.0 | 81 | 11.1 | 0.4 | 15.5 |
| | 24.5 | 75.5 | 15.4 | 27.0 | 5.1 | 77 | 13.1 | 2.0 | 16.0 |
| | 32.5 | 83.5 | 17.3 | 25.1 | 5.2 | 95 | 16.7 | 3.4 | 16.8 |
| 08/25/87 | 0.5 | 48.6 | 11.1 | 19.0 | 4.4 | 77 | 7.5 | nd | 13.3 |
| | 7.0 | 49.0 | 11.2 | 11.2 | 1.7 | 87 | 7.1 | nd | 13.0 |
| | 14.0 | 62.0 | 13.6 | 21.1 | 1.8 | 69 | 10.5 | nd | 14.9 |
| | 21.0 | 62.0 | 14.2 | 17.4 | 1.4 | 88 | 12.3 | nd | 15.3 |
| | 28.0 | 69.0 | 15.1 | 22.0 | 0.7 | 88 | 14.2 | 2.4 | 15.7 |

**Table 8.3-A18. Cation and anion data for Waugh for five sampling dates in 1986 and 1987 (Lund 1988). (Originally Tables 61 and 62)**

| DATE | DEPTH M | CA | MG | NA | K | ANC | CL | $NO_3$-N | $SO_4$-S |
|---|---|---|---|---|---|---|---|---|---|
| | | uEq/L | | | | | | | |
| 07/08/86 | 0.5 | 23.65 | 4.29 | 9.39 | 1.92 | 22 | 1.18 | 1.43 | 5.88 |
| | 1.5 | 24.15 | 3.63 | 9.70 | 1.89 | 27 | 1.18 | 1.36 | 5.81 |
| | 2.5 | 23.70 | 3.38 | 9.57 | 2.46 | 21 | 1.07 | 1.36 | 6.00 |
| | 3.5 | 24.35 | 3.22 | 9.39 | 2.79 | 19 | 1.21 | 1.36 | 5.88 |
| | 5.0 | 21.35 | 2.72 | 8.39 | 1.84 | 20 | 1.01 | 1.64 | 5.81 |
| 08/26/86 | 0.5 | 21.00 | 2.56 | 8.87 | 3.73 | 22 | 1.21 | 1.07 | 7.19 |
| | 2.5 | 21.95 | 2.56 | 9.09 | 3.89 | 28 | 1.35 | 1.00 | 7.19 |
| | 4.5 | 22.30 | 2.47 | 9.00 | 3.40 | 22 | 1.21 | 1.00 | 7.25 |
| | 6.0 | 22.00 | 3.88 | 8.70 | 3.02 | 24 | 1.18 | 0.93 | 7.19 |
| 10/08/86 | 0.5 | 24.00 | 3.05 | 10.00 | 4.45 | 22 | 2.03 | nd | 9.81 |
| | 2.0 | 23.60 | 2.89 | 10.09 | 3.96 | 22 | 1.55 | nd | 8.19 |
| | 3.5 | 24.35 | 2.80 | 9.83 | 3.71 | 26 | 1.53 | nd | 9.63 |
| | 5.0 | 24.00 | 2.80 | 9.96 | 3.07 | 23 | 1.32 | nd | 8.81 |
| | 6.0 | 23.40 | 2.72 | 9.87 | 3.02 | 28 | 1.72 | nd | 9.75 |
| DATE | DEPTH M | CA | MG | NA | K | ANC | CL | $NO_3$-N | $SO_4$-S |
| | | uEq/L | | | | | | | |
| 06/29/87 | 0.5 | 28.8 | 5.1 | 7.6 | 2.8 | 35 | 3.3 | 2.5 | 9.7 |
| | 3.5 | 28.8 | 5.1 | 9.1 | 3.1 | 28 | 3.4 | 2.6 | 9.6 |
| | 6.5 | 27.6 | 4.5 | 7.4 | 2.6 | 23 | 3.0 | 3.1 | 9.4 |
| | 9.5 | 27.5 | 4.7 | 7.7 | 3.6 | 26 | 3.0 | 3.1 | 9.1 |
| | 12.5 | 27.7 | 5.8 | 8.7 | 4.2 | 35 | 3.1 | 3.0 | 9.1 |
| 08/25/87 | 0.5 | 24.8 | 4.3 | 2.3 | 1.0 | 50 | 2.9 | nd | 9.0 |
| | 3.0 | 25.5 | 4.3 | 0.0 | 0.3 | 27 | 2.9 | nd | 9.1 |
| | 5.5 | 24.2 | 4.4 | 1.7 | 3.3 | 20 | 2.8 | nd | 9.1 |
| | 8.0 | 22.3 | 4.3 | 0.0 | 3.5 | 19 | 2.7 | nd | 9.1 |
| | 10.5 | 27.2 | 6.2 | 5.3 | 4 7 | 45 | 2.8 | nd | 9.1 |

## Table 8.3-A19. Concentration of selected elements in samples from Agnew for five sampling dates in 1986 and 1987 (Lund 1988). (Originally Tables 63 and 64)

| DATE | DEPTH M | SI | B | BA | AL | FE | MN |
|---|---|---|---|---|---|---|---|
| | | UMOL/L | | | | | |
| 7-08-86 | 0.5 | 48.7 | nd | 0.02 | nd | 0.78 | 0.17 |
| | 5.5 | 47.3 | nd | 0.01 | nd | 0.34 | 0.15 |
| | 10.5 | 47.0 | nd | 0.01 | nd | 0.30 | 0.14 |
| | 15.5 | 48.0 | nd | 0.01 | nd | 0.36 | 0.18 |
| | 20.5 | 48.0 | nd | 0.01 | nd | 0.35 | 0.19 |
| 8-26-86 | 0.5 | 69.7 | 2.04 | 0.02 | nd | 0.44 | 0.28 |
| | [illegible] | 70.5 | 1.45 | 0.02 | nd | 0.40 | 0.29 |
| | 12.5 | 72.6 | 2.24 | 0.02 | nd | 0.58 | 0.32 |
| | 18.5 | 64.8 | 4.16 | 0.04 | nd | 1.35 | 0.49 |
| | 24.0 | 189.7 | 25.11 | 0.21 | 3.77 | 24.99 | 12.96 |
| 10-08-86 | 0.5 | 88.6 | 6.05 | 0.04 | nd | 5.17 | 1.08 |
| | 6.0 | 89.3 | 5.48 | 0.05 | nd | 5.11 | 1.10 |
| | 11.5 | 90.8 | 6.34 | 0.06 | 0.43 | 5.31 | 1.13 |
| | 17.5 | 91.1 | 6.18 | 0.05 | nd | 5.51 | 1.15 |
| | 22.5 | 91.1 | 6.29 | 0.06 | 4.21 | 5.65 | 1.17 |

| DATE | DEPTH M | SI | B | BA | AL | FE | MN |
|---|---|---|---|---|---|---|---|
| | | uMOL/L | | | | | |
| 06/29/87 | 0.5 | 156.3 | 14.62 | 0.09 | nd | 0.57 | 0.36 |
| | 2.5 | 156.7 | 14.25 | 0.07 | nd | 0.37 | 0.31 |
| | 4.5 | 157.7 | 14.62 | 0.09 | nd | 0.50 | 0.33 |
| | 6.5 | 158.8 | 14.34 | 0.08 | nd | 0.55 | 0.36 |
| | 8.5 | 158.1 | 15.26 | 0.09 | nd | 0.93 | 0.50 |
| 08/25/87 | 0.5 | 147.1 | 13.41 | 0.09 | nd | 0.78 | 0.31 |
| | 6.0 | 147.8 | 13.60 | 0.08 | nd | 0.81 | 0.34 |
| | 12.0 | 153.8 | 17.67 | 0.11 | nd | 1.10 | 1.08 |
| | 18.0 | 177.3 | 23.03 | 0.18 | nd | 1.02 | 2.29 |
| | 24.0 | 212.2 | 32.65 | 2.94 | nd | 12.80 | 12.72 |

## Table 8.3-A20. Concentration of selected elements in samples from Gem for six sampling dates in 1986 and 1987 (Lund 1988). (Originally Tables 67 and 68)

| DATE | DEPTH M | SI | B | BA | AL | FE | MN |
|---|---|---|---|---|---|---|---|
| | | UMOL/L | | | | | |
| 7-08-86 | 0.5 | 36.0 | nd | nd | nd | 0.17 | 0.03 |
| | 7.5 | 36.7 | nd | nd | nd | 0.16 | 0.03 |
| | 14.5 | 38.1 | 0.19 | 0.01 | 0.15 | 0.22 | 0.06 |
| | 21.5 | 43.1 | nd | 0.01 | nd | 0.26 | 0.10 |
| | 28.5 | 44.9 | nd | 0.02 | nd | 0.36 | 0.12 |
| 8-26-86 | 0.5 | 36.7 | 1.03 | 0.01 | 1.52 | 0.16 | nd |
| | 7.5 | 37.0 | 0.61 | nd | 6.19 | 0.15 | 0.02 |
| | 14.5 | 38.1 | 1.17 | nd | 0.42 | 0.14 | nd |
| | 21.5 | 50.9 | 0.88 | 0.01 | 1.11 | 0.17 | 0.02 |
| | 28.5 | 55.2 | 1.20 | 0.02 | 1.09 | 0.26 | 0.09 |
| 10-08-86 | 0.5 | 37.7 | 1.21 | 0.01 | 2.70 | 0.20 | nd |
| | 7.5 | 37.7 | 0.89 | 0.01 | 2.27 | 0.19 | 0.02 |
| | 13.5 | 37.0 | 0.34 | nd | nd | 0.15 | nd |
| | 20.5 | 43.4 | 0.75 | nd | 0.92 | 0.23 | nd |
| | 26.5 | 52.0 | nd | 0.01 | 0.47 | 0.12 | nd |

| DATE | DEPTH M | SI | B | BA | AL | FE | MN |
|---|---|---|---|---|---|---|---|
| | | uMOL/L | | | | | |
| 03/25/87 | 0.5 | 45.2 | 0.64 | nd | nd | 0.35 | 0.21 |
| | 8.0 | 44.2 | 0.82 | nd | nd | 0.32 | 0.19 |
| | 15.5 | 43.8 | 0.87 | nd | nd | 0.25 | 0.19 |
| | 23.0 | 44.5 | 0.70 | 0.05 | 0.28 | 0.27 | 0.24 |
| | 37.0 | 37.0 | 0.70 | 0.05 | 0.28 | 1.01 | 0.49 |
| 06/29/87 | 0.5 | 46.6 | 0.48 | nd | 0.26 | 0.40 | nd |
| | 8.5 | 56.7 | 0.13 | nd | 0.64 | 0.15 | nd |
| | 16.5 | 57.7 | 0.37 | nd | nd | 0.30 | 0.10 |
| | 24.5 | 58.8 | 0.34 | 0.08 | 1.41 | 0.45 | 0.19 |
| | 32.5 | 58.1 | 0.59 | nd | nd | 0.99 | 0.44 |
| 08/25/87 | 0.5 | 42.7 | nd | nd | nd | nd | nd |
| | 7.0 | ~~42.0~~ | ~~nd~~ | ~~nd~~ | ~~nd~~ | ~~nd~~ | ~~nd~~ |
| | 14.0 | 45.2 | nd | nd | nd | nd | nd |
| | 21.0 | 46.3 | nd | nd | nd | nd | nd |
| | 28.0 | 47.7 | nd | nd | nd | nd | nd |

## Table 8.3-A21. Concentration of selected elements in samples from Waugh for five sampling dates in 1986 and 1987 (Lund 1988). (Originally Tables 81 and 82)

| DATE | DEPTH M | SI | B | BA | AL | FE | MN |
|---|---|---|---|---|---|---|---|
| | | UMOL/L | | | | | |
| 7-08-86 | 0.5 | 26.0 | nd | 0.01 | nd | 0.14 | 0.03 |
| | 1.5 | 25.6 | nd | nd | nd | 0.07 | 0.02 |
| | 2.5 | 25.5 | nd | nd | nd | 0.04 | nd |
| | 3.5 | 24.7 | nd | nd | nd | nd | nd |
| | 5.0 | 22.5 | nd | nd | nd | 0.06 | nd |
| 8-26-86 | 0.5 | 23.8 | nd | nd | 4.28 | 0.35 | 0.03 |
| | 2.5 | 23.6 | nd | nd | nd | 0.27 | 0.03 |
| | 4.5 | 22.6 | nd | nd | nd | 0.07 | nd |
| | 6.5 | 23.0 | nd | nd | 0.18 | 0.12 | 0.02 |
| 10-08-86 | 0.5 | 21.6 | nd | nd | 5.02 | 0.50 | 0.03 |
| | 2.0 | 21.1 | nd | nd | nd | 0.29 | 0.03 |
| | 3.5 | 20.3 | nd | nd | nd | 0.17 | nd |
| | 5.5 | 20.8 | nd | nd | nd | 0.23 | 0.03 |
| | 6.5 | 20.9 | nd | nd | 0.48 | 0.26 | 0.03 |

| DATE | DEPTH M | SI | B | BA | AL | FE | MN |
|---|---|---|---|---|---|---|---|
| | | uMOL/L | | | | | |
| 06/29/87 | 0.5 | 36.0 | 0.00 | nd | nd | 0.23 | nd |
| | 3.5 | 34.4 | 0.00 | nd | 0.92 | 0.14 | nd |
| | 6.5 | 31.3 | 0.36 | nd | 0.66 | 0.20 | nd |
| | 9.5 | 32.5 | 0.37 | nd | nd | 0.24 | nd |
| | 12.5 | 35.6 | nd | nd | 1.86 | 0.89 | nd |
| 08/25/87 | 0.5 | 24.5 | nd | nd | nd | 0.38 | nd |
| | 3.0 | 24.4 | nd | nd | 0.59 | 0.35 | nd |
| | 5.5 | 25.3 | nd | nd | nd | 0.53 | nd |
| | 8.0 | 24.6 | nd | nd | nd | 0.28 | nd |
| | 10.5 | 32.9 | nd | nd | nd | nd | nd |

# Table 8.3-A22. Water Quality Summary of Grant Lake Reservoir Outlet (1940–1991) Collected by LADWP and Jones & Stokes Associates

| | | Samples | | Mean | | Minimum | | Maximum | |
|---|---|---|---|---|---|---|---|---|---|
| Variable | Units | LADWP | JSA | LADWP | JSA | LADWP | JSA | LADWP | JSA |
| Specific conductance | FS/cm | 354 | 10 | 59 | 61 | 40 | 58 | 165 | 63 |
| Total organic carbon | mg/l | 2 | 10 | 0.9 | 2 | 0.8 | ND | 0.9 | 4 |
| Color | units | 351 | 10 | 6 | 5 | 0 | ND | 38 | 15 |
| Turbidity | NTU | 351 | 10 | 3.0 | 1 | 0.0 | 1 | 28 | 3 |
| Total suspended solids | mg/l | 0 | 10 | | 4 | | ND | | 10 |
| Total dissolved solids | mg/l | 0 | 10 | | 37 | | 31 | | 47 |
| Alkalinity (as $CaCo_3$) | mg/l | 353 | 10 | 18 | 22 | 10 | 20 | 31 | 26 |
| Hardness (as $CaCo_3$) | mg/l | 354 | 10 | 21 | 24 | 12 | 20 | 41 | 38 |
| Calcium | mg/l | 354 | 10 | 6.6 | 8 | 0.0 | 7 | 12 | 9 |
| Magnesium | mg/l | 353 | 10 | 1.0 | 1 | 0.0 | 1 | 5 | 1 |
| Sodium | mg/l | 354 | 10 | 2.7 | 2 | 0.0 | 2 | 10 | 3 |
| Potassium | mg/l | 345 | 10 | 0.7 | 1 | 0.0 | 1 | 4 | 1 |
| Sulfate | mg/l | 353 | 10 | 4.8 | 4 | 0.0 | 3 | 18 | 4 |
| Chloride | mg/l | 354 | 10 | 1.8 | 2 | 0.0 | 1 | 9.2 | 2 |
| Silica | mg/l | 352 | 10 | 6 | 6 | 1 | 5 | 20 | 7 |
| Boron | mg/l | 210 | 10 | 0.04 | 0 | 0.00 | ND | 0.33 | 0 |
| Fluoride | mg/l | 354 | 5 | 0.05 | 0 | 0.00 | ND | 0.40 | ND |
| Bromide | mg/l | 0 | 3 | | 0 | | ND | | ND |
| Ammonia (as N) | mg/l | 0 | 10 | | 0 | | ND | | 0 |
| Total Kjeldahl nitrogen | mg/l | 350 | 10 | 0.22 | 0 | 0.02 | ND | 0.96 | ND |
| Nitrate (as N) | mg/l | 342 | 10 | 0.06 | 0 | 0.00 | ND | 0.45 | ND |
| Total phosphate | mg/l | 0 | 10 | | 0 | | ND | | 0 |
| Dissolved phosphate | mg/l | 174 | 0 | 0.025 | | 0.000 | | 0.490 | |
| Silver | Fg/l | 0 | 6 | | 0 | | ND | | ND |
| Aluminum | Fg/l | 0 | 6 | | 92 | | ND | | 230 |
| Arsenic | Fg/l | 90 | 6 | 10 | ND | 10 | ND | 20 | ND |
| Barium | Fg/l | 0 | 6 | | ND | | ND | | ND |
| Cadmium | Fg/l | 0 | 6 | | 0 | | ND | | 0 |
| Chromium | Fg/l | 0 | 6 | | ND | | ND | | ND |
| Copper | Fg/l | 0 | 10 | | ND | | ND | | ND |
| Iron | Fg/l | 353 | 10 | 38 | 45 | 0 | ND | 300 | 230 |
| Mercury | Fg/l | 0 | 6 | | ND | | ND | | ND |
| Manganese | Fg/l | 0 | 10 | | 13 | | ND | | 39 |
| Lead | Fg/l | 0 | 6 | | ND | | ND | | ND |
| Selenium | Fg/l | 0 | 6 | | ND | | ND | | ND |
| Zinc | Fg/l | 0 | 10 | | ND | | ND | | ND |

Notes: LADWP sampling 1940-1990. Jones & Stokes Associates (JSA) sampling 1991.

*Source: SWRCB 1993*

# FIGURES

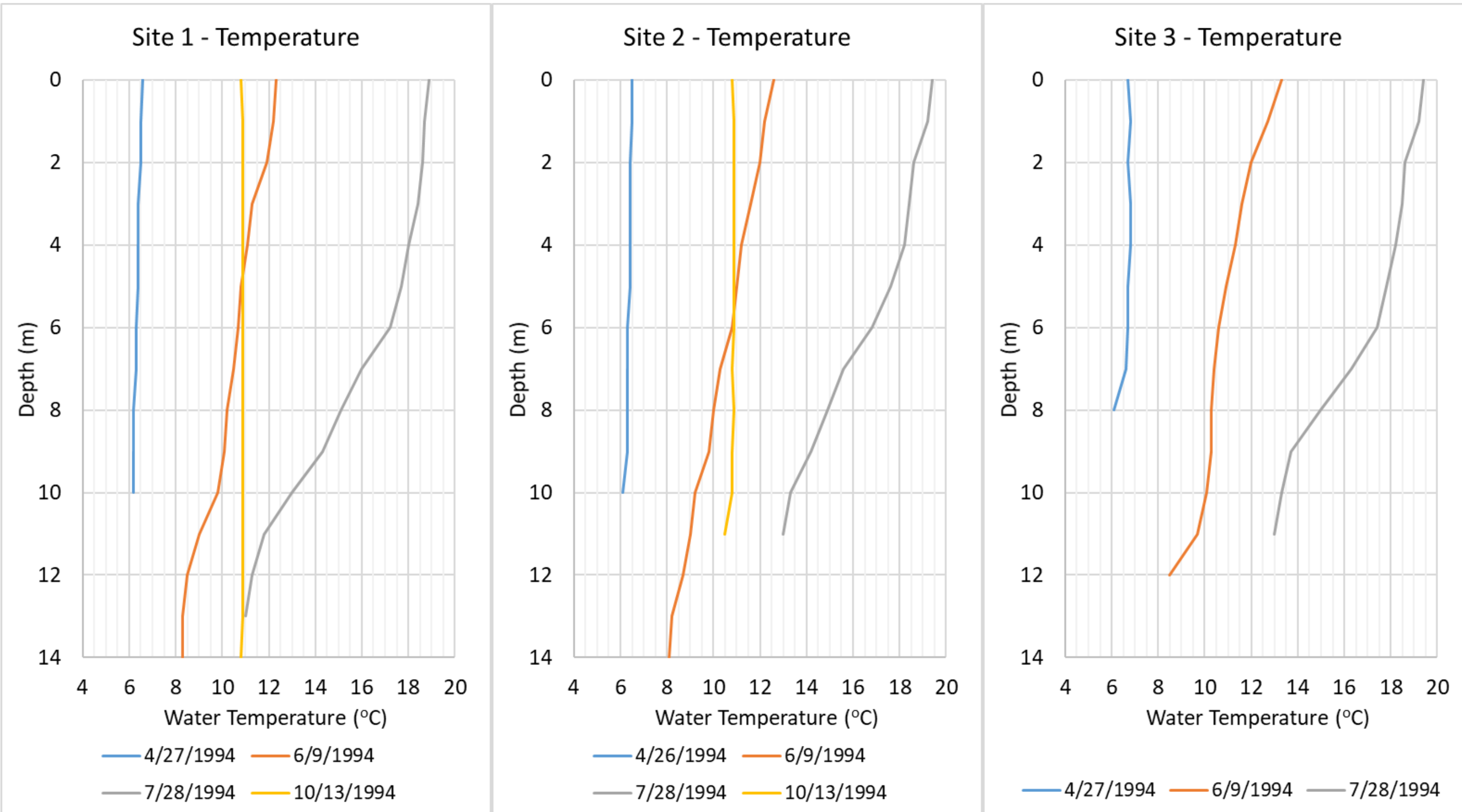



**Figure 8.3-A1. USGS Temperature Monitoring Profiles at Silver Lake Sites 1, 2 and 3**

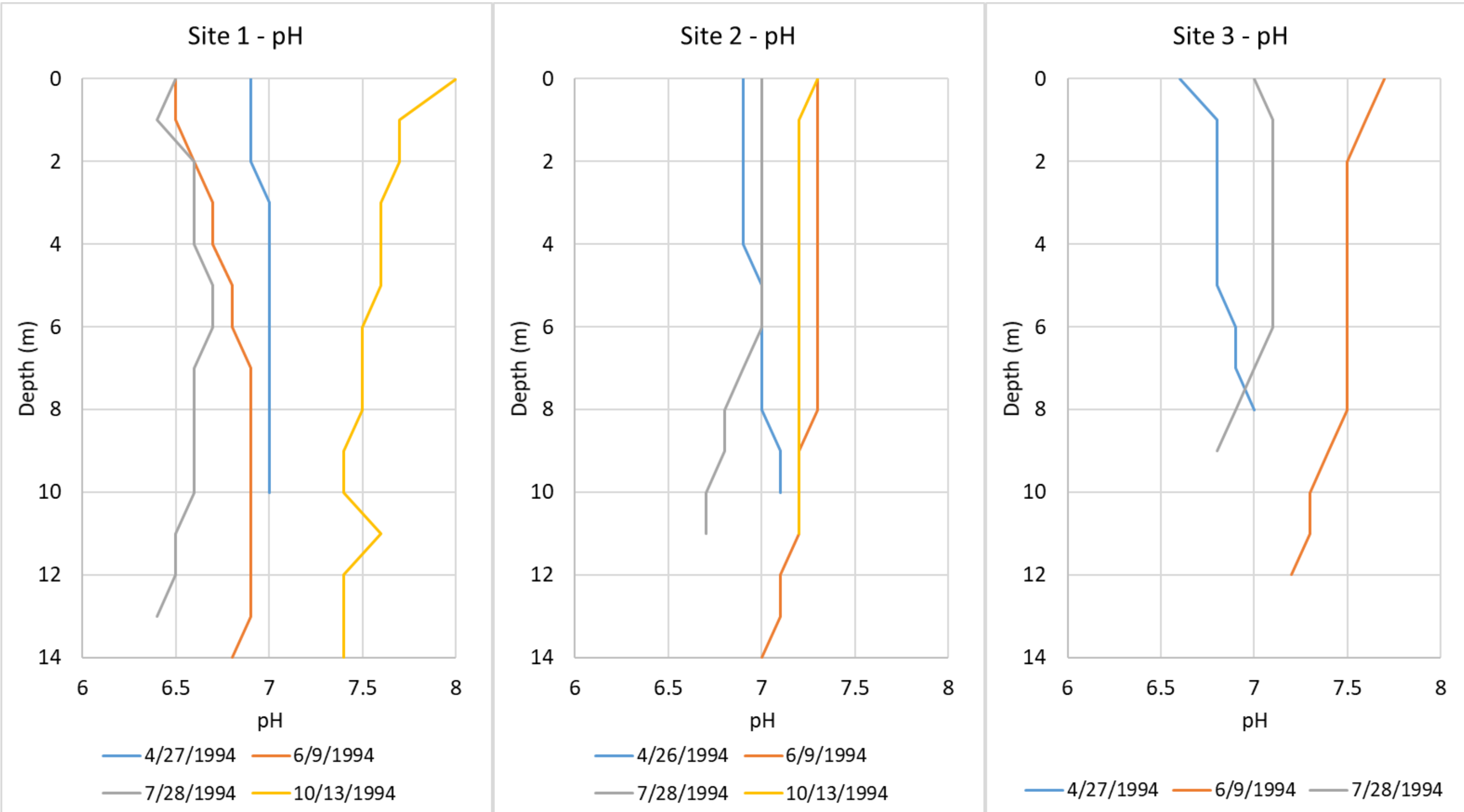



**Figure 8.3-A2. USGS pH Monitoring Profiles at Silver Lake Sites 1, 2 and 3**

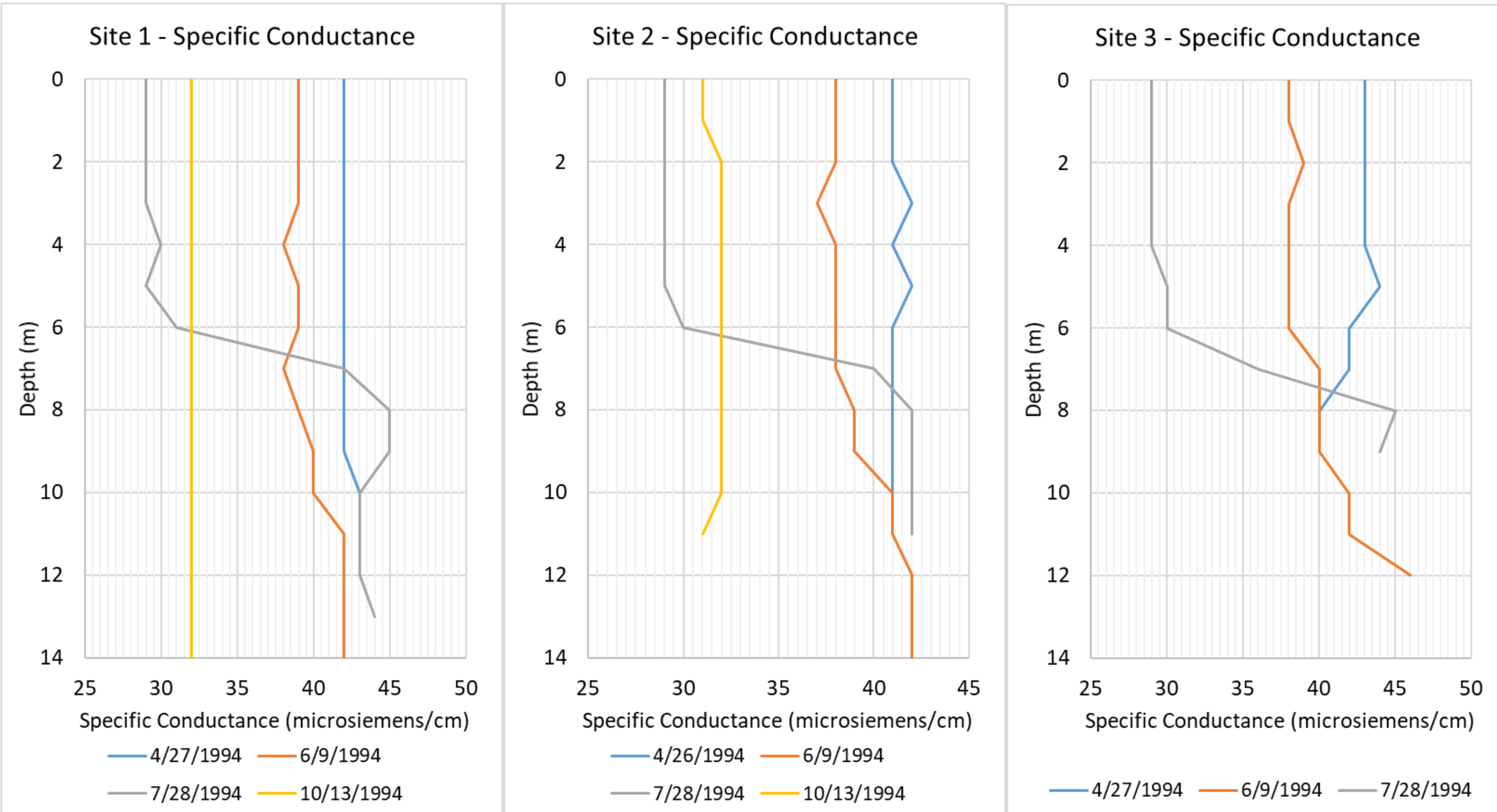



**Figure 8.3-A3. USGS Specific Conductance Monitoring Profiles at Silver Lake Sites 1, 2 and 3**

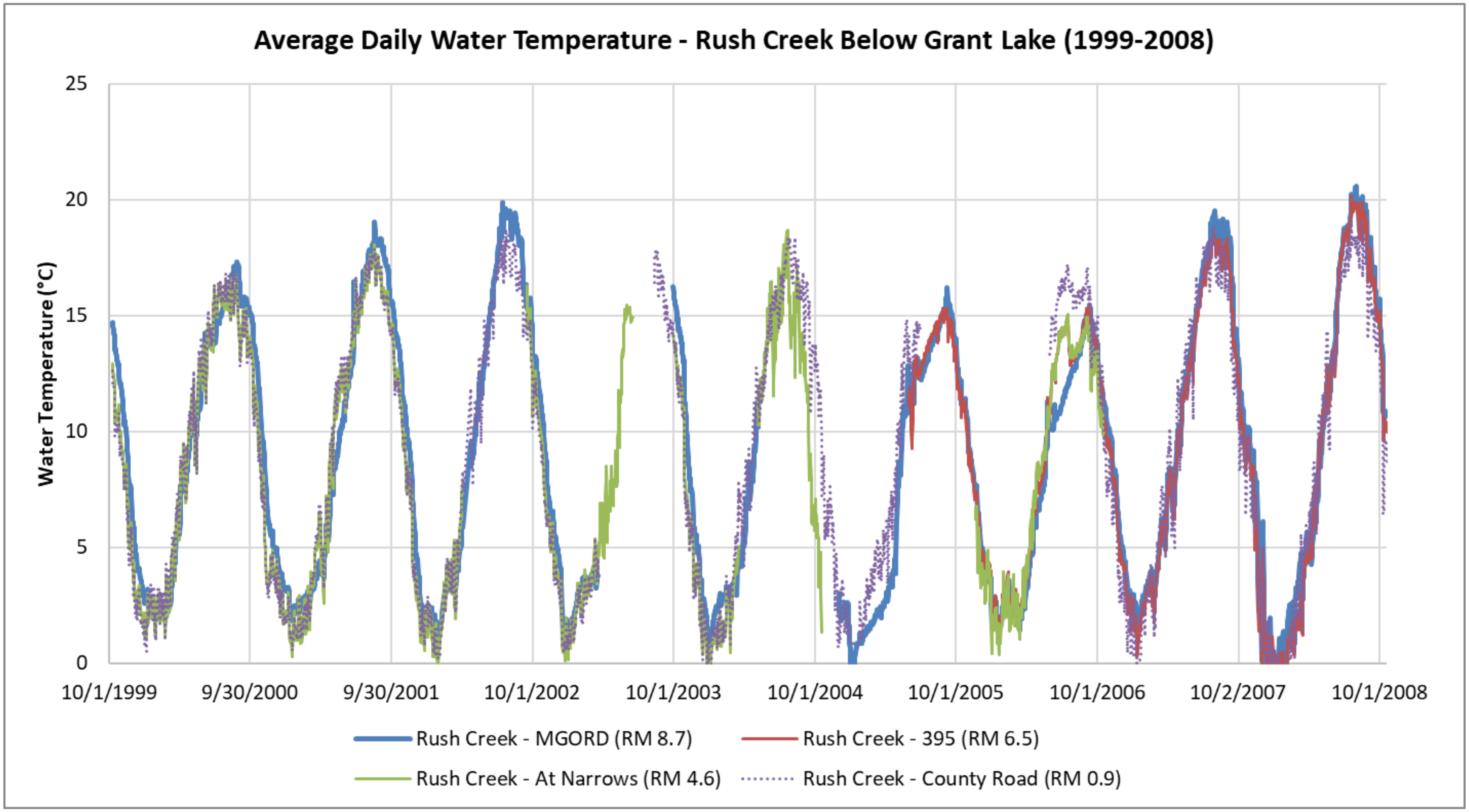
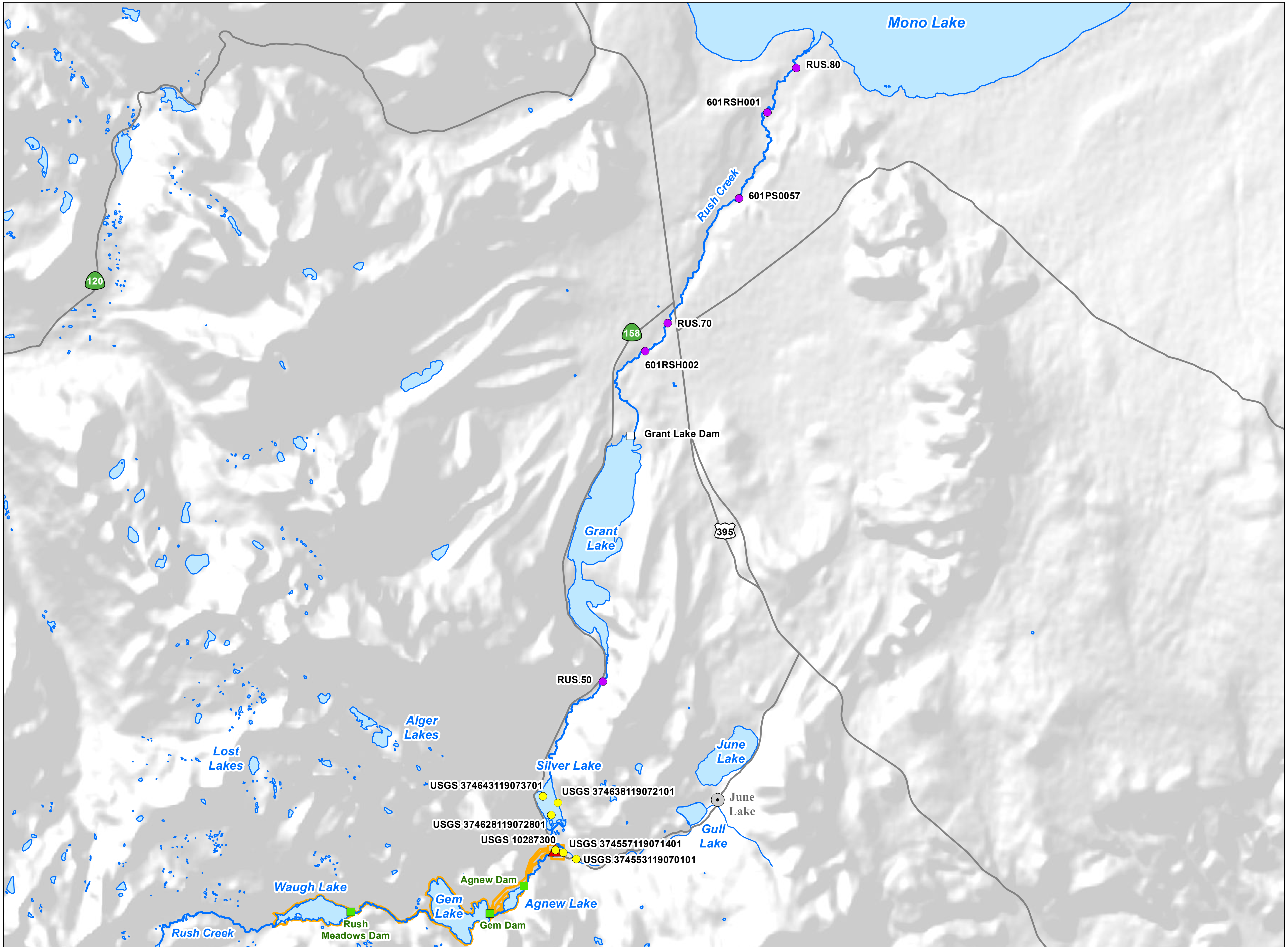



**Figure 8.3-A4. Daily average water temperatures measured at four locations on Rush Creek downstream of Grant Lake (1999–2008)**

# MAPS




**SCE Facilities**

- Dam
- Powerhouse
- FERC Boundary

**Other Features**

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

**Water Quality Monitoring Sites**

- CDEN
- USGS

SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead℠

Rush Creek Project (FERC 1389)

**Map 8.3-A1**

**Water Quality Monitoring Sites in the Vicinity of the Rush Creek Project**

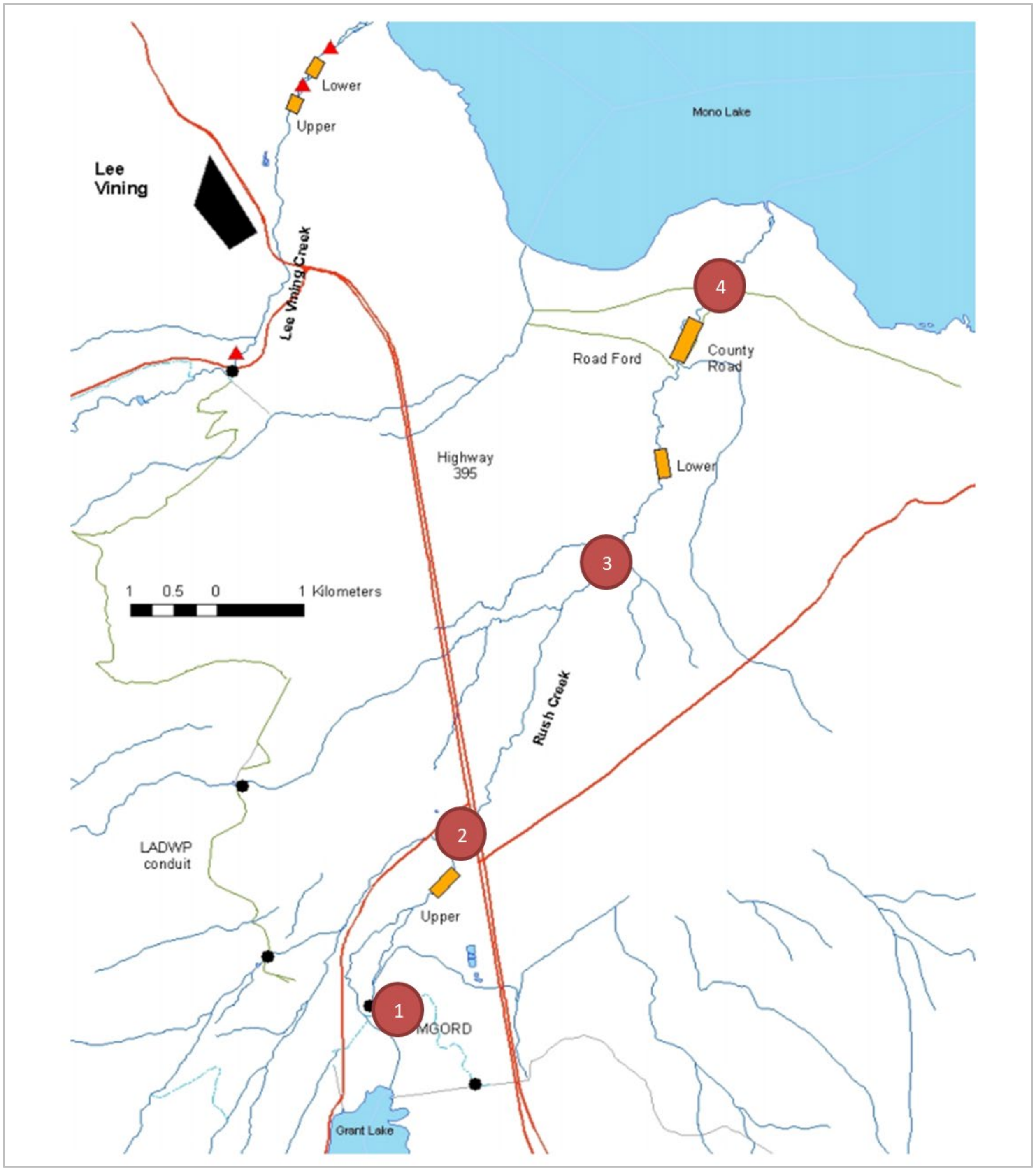
0 0.5 1 Miles

Date: 5/5/2024

**Projection: UTM Zone 11**
**Datum: NAD 83**



C:\GIS\237800343\map\Rush Creek\HydroMaps\SCE_RUSH_CREEK_MonSites_H2OQual_17i11i_01.mxd




*Source: Shepard et. al 2009*

**Map 8.3-A2. Locations of Continuous Temperature Monitoring on Rush Creek Downstream of Grant Lake**

## TABLE OF CONTENTS

Page

8.4 Fish and Aquatic Resources ... 8.4-1
- 8.4.1 Information Sources ... 8.4-1
- 8.4.2 Project Study Area Overview ... 8.4-3
- 8.4.3 Overview of Aquatic Species ... 8.4-3
- 8.4.4 Resource Management Objectives ... 8.4-4
- 8.4.5 Aquatic Physical Environment ... 8.4-6
- 8.4.6 General Aquatic Community ... 8.4-13
- 8.4.7 Entrainment and Associated Mitigation ... 8.4-19
- 8.4.8 Special-Status Aquatic Species ... 8.4-20
- 8.4.9 References ... 8.4-20

## LIST OF TABLES

Table 8.4-1. Study Area Stream and Lake Reaches ... 8.4-25

Table 8.4-2. Summary of Fish Species Observed During the 2023 Fish Population Sampling ... 8.4-26

Table 8.4-3. Rush Creek Barriers to Upstream Migration in the Vicinity of the Project ... 8.4-27

Table 8.4-4. Summary of Fish Species Captured during Reservoir Gill Netting ... 8.4-28

Table 8.4-5. Condition Factors by Species Collected by Electrofishing and Gillnetting ... 8.4-29

Table 8.4-6. Summary of Fish Sampled at Stream Sampling Sites ... 8.4-30

Table 8.4-7. Average Length and Number of Scale Aged Trout at Stream Sampling Sites ... 8.4-31

Table 8.4-8. Species Density and Biomass at Sampling Sites ... 8.4-32

Table 8.4-9. Historical Comparison of Species Density and biomass in Rush Creek (Site RC21.65) below Rush Meadows Dam ... 8.4-33

Table 8.4-10. Species and Life Stage Periodicities ... 8.4-34

## LIST OF FIGURES

Figure 8.4-1. Rush Creek Stream and Lake Reaches ........ 8.4-36

Figure 8.4-2. Elevation of Sampling Sites on Rush Creek and Fish Species Distribution ........ 8.4-37

Figure 8.4-3. Habitat versus flow relationships for Rush Creek Below Gem Dam to Reverse Creek shown for the full flow range (top) and a lower flow range (bottom). The grayed area above 100 cfs (top) represents where the habitat modeling is extrapolated substantially above the calibration data and is less accurate. ........ 8.4-38

Figure 8.4-4. Habitat versus flow relationships for Rush Creek Above Silver Lake shown for the full flow range (top) and a lower flow range (bottom). The grayed area above 200 cfs (top) represents where the habitat modeling is extrapolated substantially above the calibration data and is less accurate........ 8.4-39

Figure 8.4-5. Habitat versus flow relationships for Rush Creek Below Silver Lake shown for the full flow range (top) and a lower flow range (bottom). The grayed area above 200 cfs (top) represents where the habitat modeling is extrapolated substantially above the calibration data and is less accurate........ 8.4-40

Figure 8.4-6. Habitat Versus Flow Relationships for South Rush Creek Shown Over the Full Flow Range (top) and a Lower Flow Range (bottom) ........ 8.4-41

Figure 8.4-7. Wetted Perimeter for Rush Creek Below Gem Dam to Reverse Creek ........ 8.4-42

Figure 8.4-8. Wetted Perimeter for Rush Creek Above Silver Lake ........ 8.4-42

Figure 8.4-9. Wetted Perimeter for Rush Creek Below Silver Lake ........ 8.4-43

Figure 8.4-10. Wetted Perimeter for South Rush Creek ........ 8.4-43

Figure 8.4-11a. Adult Trout Daily Habitat Time Series (1990-2021) Exceedance Plots for Rush Creek below Gem Dam (Existing Condition and Proposed Project hydrology) ........ 8.4-44

Figure 8.4-11b. Juvenile trout Daily Habitat Time Series (1990-2021) Exceedance Plots for Rush Creek below Gem Dam (Existing Condition and Proposed Project Hydrology)........ 8.4-45

Figure 8.4-11c. Fry Trout Daily Habitat Time Series (1990-2021) Exceedance Plots for Rush Creek below Gem Dam (Existing Condition and Proposed Project Hydrology)........................................................ 8.4-46

Figure 8.4-11d. Spawning Trout Daily Habitat Time Series (1990-2021) Exceedance Plots for Rush Creek below Gem Dam (Existing Condition and Proposed Project hydrology) ................................. 8.4-46

Figure 8.4-12a. Adult Trout Daily Habitat Time Series (1990-2021) Exceedance Plots for Rush Creek above Silver Lake (Existing Condition and Proposed Project Hydrology)........................................................ 8.4-47

Figure 8.4-12b. Juvenile Trout Daily Habitat Time Series (1990-2021) Exceedance Plots for Rush Creek above Silver Lake (Existing Condition and Proposed Project Hydrology)................................. 8.4-48

Figure 8.4-12c. Fry Trout Daily Habitat Time Series (1990-2021) Exceedance Plots for Rush Creek above Silver Lake (Existing Condition and Proposed Project Hydrology)........................................................ 8.4-49

Figure 8.4-13a. Adult Trout Daily Habitat Time Series (1990-2021) Exceedance Plots for Rush Creek below Silver Lake (Existing Condition and Proposed Project Hydrology)........................................................ 8.4-50

Figure 8.4-13b. Juvenile Trout Daily Habitat Time Series (1990-2021) Exceedance plots for Rush Creek below Silver Lake (Existing Condition and Proposed Project Hydrology)................................. 8.4-51

Figure 8.4-13c. Fry Trout Daily Habitat Time Series (1990-2021) Exceedance Plots for Rush Creek Below Silver Lake (Existing Condition and Proposed Project hydrology) ........................................................ 8.4-52

Figure 8.4-13d. Spawning Trout Daily Habitat Time Series (1990-2021) Exceedance plots for Rush Creek below Silver Lake (Existing Condition and Proposed Project Hydrology)................................. 8.4-52

Figure 8.4-14a. Adult Trout Daily Habitat Time Series (1990–2021) Exceedance Plots for South Rush Creek (Existing Condition and Proposed Project Hydrology)........................................................................ 8.4-53

Figure 8.4-14b. Juvenile Trout Daily Habitat Time Series (1990–2021) Exceedance Plots for South Rush Creek (Existing Condition and Proposed Project Hydrology)................................................. 8.4-54

Figure 8.4-14c. Fry Trout Daily Habitat Time Series (1990–2021) Exceedance Plots for South Rush Creek (Existing Condition and Proposed Project Hydrology)........................................................................ 8.4-55

Figure 8.4-14d. Spawning Trout Daily Habitat Time Series (1990–2021) Exceedance Plots for South Rush Creek (Existing Condition and Proposed Project Hydrology) ... 8.4-55

Figure 8.4-15. Length and Weight Relationship for Each Species at All Study Sites Combined ... 8.4-56

## LIST OF MAPS

Map 8.4-1. Fish Population Sampling Locations ... 8.4-58

Map 8.4-2. Fish Passage Barrier Locations ... 8.4-59

Map 8.4-3. Water Temperature and Water Quality Sampling Locations ... 8.4-60

## LIST OF ACRONYMS

| | |
|---|---|
| °C | degrees Celsius |
| ac-ft | acre-feet |
| CDFW | California Department of Fish and Wildlife |
| cfs | cubic feet per second |
| FERC | Federal Energy Regulatory Commission |
| FL | fork length |
| Forest Service | United States Forest Service |
| HSC | habitat suitability criteria |
| lbs | pounds |
| LCT | Lahontan cutthroat trout |
| mm | millimeter(s) |
| msl | mean sea level |
| Project | Rush Creek Project |
| SCE | Southern California Edison Company |
| SD A | Supporting Document A |
| SNYLF | Sierra Nevada yellow-legged frog |
| SR-158 | State Route 158 |
| TDS | total dissolved solids |
| WUA | weighted usable area |
| YOY | young-of-the-year |
| YT | Yosemite toad |

## 8.4 FISH AND AQUATIC RESOURCES

This section describes aquatic physical habitat and fish and aquatic resources in the vicinity of Southern California Edison Company's (SCE) Rush Creek Project (Project), including Project-affected reaches. Physical resource information pertinent to the discussion of fish and aquatic resources (hydrology, water quality / temperature, and geomorphology) is also summarized in this section. Detailed information on hydrology (Section 8.2), water quality (Section 8.3), and geomorphology (Section 8.7) can be found in the respective sections for each of these topics.

In addition, this section describes rare, threatened, and endangered aquatic species in the vicinity of the Project. A description of terrestrial resources associated with the Project, including rare, threatened, and endangered terrestrial species is included in Section 8.5, Botanical and Wildlife Resources.

### 8.4.1 Information Sources

The aquatic resources information is based on a review of existing literature, agency, and stakeholder consultation, and studies conducted as part of the Rush Creek relicensing process. A summary of agency and stakeholder consultation is provided in Section 13. Seven aquatic technical studies were developed in consultation with agencies and other interested relicensing stakeholders and approved by the Federal Energy Regulatory Commission (FERC). These studies were initiated in 2023 with additional efforts planned and ongoing in 2024.

Key information sources are summarized below:

- Natural Resource Information System data from United States Forest Service (Forest Service) Region 5 (Forest Service 2017).
- Inyo National Forest lists of species of Conservation Concern (Forest Service 2019a).
- Forest Service Final Environmental Impact Statement for Revision of the Inyo National Forest Land Management Plan (Forest Service 2019b).
- United States Fish and Wildlife Service Information for Planning, and Conservation System website was queried to generate a list of federal endangered and threatened species (USFWS 2020).
- California Department of Fish and Wildlife (CDFW) Habitat Management Land Rush Creek Management Unit, Herps Dataset. October 10, 2016 (CDFW 2016).
- California Natural Diversity Database RareFind, Version 5.0. Online Database. California Department of Fish and Wildlife, Version 5.1.1 (CNDDB 2020).
- FERC's Environmental Assessment, Rush Creek Project (FERC Project No. 1389) (FERC 1992).

- FERC's Order Issuing New License, Rush Creek Project (FERC 1997).
- FERC Relicensing Studies (EA Engineering, Science, and Technology, Inc. 1986, 1987a, 1987b; Lund 1988) related to instream flows, fish entrainment mortality, fish sampling, and reservoir water quality.
- FERC Monitoring Studies (Sada 2001a, 2001b, 2003; SCE 2002; Read and Sada 2012) related to fish monitoring studies, entrainment mortality, and reservoir water quality.
- Inland fishes of California. University of California Press, Berkeley. 502 pp (Moyle 2002).
- Quantification and evaluation of aquatic habitat as a function of flow in the Draft AQ 1 – Instream Flow Technical Study Report (AQ 1 – TSR; SCE 2024a), which is included in Supporting Document A (SD A).
- Analysis of unimpaired, existing, and proposed Project hydrology in the Draft AQ 2 – Hydrology Technical Study Report (AQ 2 – TSR; SCE 2024b), which is included in SD A.
- Documentation of fish species composition, distribution, and abundance; and characterization of fish growth and population age structure in the Project reaches in the Draft AQ 6 – Fish Population Technical Study Report (AQ 6 – TSR; SCE 2024c), which is included in SD A.
- Documentation of the location, nature, and characteristics of fish barriers in the Project reaches (AQ 6 – TSR; SCE 2024c).
- Characterization of the relationship between flow and water temperature in the Project reaches in the Draft AQ 3 – Water Temperature Technical Study Report (AQ 3 – TSR; SCE 2024d), which is included in SD A.
- Characterization of the river geomorphology, physical environment and geology in the vicinity of the Project in the Draft AQ 5 – Geomorphology Technical Study Report (AQ 5 – TSR; SCE 2024e), which is included in SD A.
- Characterization of physical, chemical, and bacterial water quality conditions in the vicinity of the Project in the Draft AQ 4 – Water Quality Technical Study Report (AQ 4 – TSR; SCE 2024f), which is included in SD A.
- Identification of Sierra Nevada Yellow-legged Frog (SNYLF) and Yosemite toad (YT) presence/absence and habitat in the study area in the Draft AQ 7 – Special-status Amphibians Technical Study Report (AQ 7 – TSR; SCE 2024g), which is included in SD A.

### 8.4.2 Project Study Area Overview

Detailed descriptions of the Rush Creek watershed, and water use and hydrology are provided in Sections 8.1 and 8.2, respectively. The study area includes eight stream reaches, three dams and associated reservoirs, and one powerhouse (Table 8.4-1, Figure 8.4-1 and Section 8.1, Map 8.1-2 [seven sheets]). The Project-affected stream reaches include Rush Creek from Waugh Lake downstream to Grant Lake. Project reservoirs include Waugh, Gem, and Agnew lakes. Gem and Agnew lakes were natural lakes prior construction of Gem Dam and Agnew Dam and, as such, have significant residual lake depth below the base of the dams. Silver Lake, on the valley floor, is not a Project Reservoir but a natural lake. Inflow to Silver Lake is affected by Project operations upstream of the lake. Silver Lake provides habitat for fish in Project-affected stream reaches. The reaches were delineated by selecting sections of stream that were relatively homogenous with respect to geomorphology and hydrology (i.e., reaches that have similar channel types and flow regimes).

Field studies to characterize aquatic resources were conducted in the Project-affected reaches and reservoirs and one reference reach upstream of Waugh Lake (Table 8.4-1). Maps 8.4-1 and 8.4-2 show the sites sampled as part of the fish population and barriers study and Map 8.4-3 shows the instream flow study sites. Locations of water quality sampling and geomorphology studies are shown in the respective sections (Section 8.2 and Section 8.7).

### 8.4.3 Overview of Aquatic Species

Rush Creek and the entire Mono Lake basin was historically fishless (presumably due to volcanism during the past million years). It is currently occupied by trout species introduced from Europe (brown trout [*Salmo trutta*]), eastern North America (brook trout [*Salvelinus fontinalis*]), and regions of California (golden trout [*Oncorhynchus aguabonita*]) and rainbow trout (*O. mykiss*) due to stocking activities (Moyle 2002). These trout-dominated waters are representative of mid- to high-elevation Eastern Sierra Nevada streams.

Results from 2023 fish population sampling events were used to characterize the distribution of fish species in Rush Creek (SCE 2024c). Table 8.4-2 and Figure 8.4-2 show the fish species observed in the vicinity of the Project, including those in the Project reservoirs (Waugh, Gem, and Agnew lakes), the Project-affected stream reaches, and comparison reach above Waugh Lake (Map 8.4-1). Rainbow trout were the most widely distributed species and were found in all but the highest elevation stream sampling site above Waugh Lake. Rainbow Trout were collected in the Project reservoirs. At the historical sampling site in Rush Creek below Rush Meadows Dam, rainbow trout appeared to be mostly rainbow trout X golden trout hybrids as identified in previous studies (Read and Sada 2012). Rainbow X golden trout hybrids were also observed in smaller numbers in Rush Creek below Agnew Dam, above Horsetail Falls. These hybrid fish are referred to as rainbow trout in this report and analysis. Brook trout were found from above Silver Lake to the highest elevation stream sampling site above Waugh Lake and in the Project reservoirs. Brown trout had the smallest distribution and were found on the valley floor from Rush Creek below Silver Lake (lowest-elevation site) to Rush Creek above Silver Lake.

There are no anadromous, catadromous, or migratory species in the vicinity of the Project. There is no Critical Habitat or Magnuson-Stevens Fishery Conservation and Management Act fish habitat in the vicinity of the Project (refer to Section 7). The introduced fish species are resident, and there are no large-scale migrations or movement of the species. There are no invasive fish species identified in the vicinity of the Project.

There are potentially three special-status aquatic species (see Section 8.4.8) in the vicinity of the Project including:

- Sierra Nevada yellow-legged frog (SNYLF) (*Rana sierrae*)
- Yosemite toad (YT) (*Anaxyrus canorus*)
- Lahontan cutthroat trout (LCT) (*O. clarkia henshawi*)

Of these three species, critical habitat exists within the FERC Project boundary for SNYLF and YT. LCT, which are endemic to the Lahontan basin, may be present in lower reaches of the Project as they have been historically stocked in Grant Lake. Additional detail for special-status species is provided in Section 8.4.8.

### 8.4.4 Resource Management Objectives

Resource management objectives that apply to aquatic resources in the Project study area are as follows:

- CDFW – No Wild or Heritage Trout Waters or rare natural communities are designated within the study area. CDFW fish management in the Project study area includes the following:
    - Waugh Lake – Management Direction = Self-sustaining fishery. Stocking Allotment = Discontinued 1965. First stocking record 1942.
    - Gem Lake – Management Direction = Stocked Reservoir/Lake; “Put and Grow” fishery; aerially planted, fingerling rainbow trout. Stocking Allotment = 100 pounds (lbs)/10,000 fish (rainbow trout-fingerlings), annually. First stocking record 1930 (20,000 brook trout); also historically stocked with Eagle Lake trout.
    - Agnew Lake – Management Direction = Stocked Reservoir/Lake; “Put and Grow” fishery; aerially planted, fingerling rainbow trout. Stocking Allotment = 100 lbs/10,000 fish (rainbow trout-fingerlings), annually. First stocking record 1930 (20,000 brook trout); also historically stocked with Eagle Lake trout.

  - Silver Lake – Management Direction = Stocked Reservoir/Lake; “Put and Take” and “Put and Grow” fishery; Roadside planted. Stocked with rainbow trout triploid catchable trout weekly/bi-weekly; Lahontan Cutthroat trout diploid fingerlings once annually. Stocking Allotment = 25,000 rainbow-catchable (12,500 lbs); 10,000/100 Eagle Lake trout-fingerling; 10,000/100 Lahontan cutthroat trout-fingerling.

  - Rush Creek upstream of the Rush Creek Powerhouse – No stocking, natural reproduction, standard fishing regulations.

  - Rush Creek above Silver Lake – No stocking, natural reproduction, standard fishing regulations.

  - Rush Creek between Silver Lake and Grant Lake – Annual stocking allotment 10,000 rainbow trout/5,000 lbs Limited fishing season (Saturday preceding Memorial Day through September 30) and bag / possession limit (5 trout).

- Federal Wild and Scenic Rivers – Rush Creek is not designated as a National Wild and Scenic River.

- Inyo National Forest Land Management Plan (Forest Service 2019b) – The management plan provides broad-scale direction for the management of Forest Service-administered public lands and resources including lands within the Rush Creek watershed.

- Ansel Adams, John Muir, and Dinkey Lakes Wilderness Management Plan, Inyo and Sierra National Forests (Forest Service 2001) – The Wilderness Management Plan amends the Sierra and Inyo National Forest Land and Resource Management Plans to provide more specific, updated, and consistent direction for the management of the Ansel Adams, John Muir, and Dinkey Lakes Wildernesses.

- Water Quality Control Plan for the Lahontan Region (Basin Plan; CRWQCB 2021) includes the following beneficial uses for Rush Creek above Grant Lake:

  - Municipal and Domestic Water Supply (MUN): Beneficial uses of waters used for community, military, or individual water supply systems including, but not limited to, drinking water supply.

  - Freshwater Replenishment (FRSH): Beneficial uses of waters used for natural or artificial maintenance of surface water quantity or quality (e.g., salinity).

  - Hydropower Generation (POW): Beneficial uses of waters used for hydroelectric power generation.

- Water Contact Recreation (REC-1): Beneficial uses of waters used for recreational activities involving body contact with water where ingestion of water is reasonably possible. These uses include, but are not limited to, swimming, wading, water-skiing, skin and scuba diving, surfing, white water activities, fishing, and use of natural hot springs.

- Noncontact Water Recreation (REC-2): Beneficial uses of waters used for recreational activities involving proximity to water, but not normally involving body contact with water where ingestion of water is reasonably possible. These uses include, but are not limited to, picnicking, sunbathing, hiking, beachcombing, camping, boating, tidepool and marine life study, hunting, sightseeing, and aesthetic enjoyment in conjunction with the above activities.

- Commercial and Sportfishing (COMM): Beneficial uses of waters used for commercial or recreational collection of fish or other organisms including, but not limited to, uses involving organisms intended for human consumption.

- Wildlife Habitat (WILD): Beneficial uses of waters that support wildlife habitats including, but not limited to, the preservation and enhancement of vegetation and prey species used by wildlife, such as waterfowl.

- Cold Freshwater Habitat (COLD): Uses of water that support cold water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates.

- Spawning, Reproduction and/or Early Development (SPWN): Uses of water that support high quality aquatic habitats suitable for reproduction and early development of fish.

### 8.4.5 Aquatic Physical Environment

The aquatic physical environment in the vicinity of the Project is described below in relation to the following ecological factors:

- Stream water temperature and water quality, gradient, channel geometry, riparian vegetation, hydrology, instream flow habitat, and fish barriers.

- Reservoir hydrology (pool volume/storage and release timing), water temperature, and entrainment.

#### 8.4.5.1 Water Temperature and Water Quality

The high topographical elevation of the Project study area (Figure 8.4-1) results in cool water temperatures (average daily water temperature below 20 degrees Celsius [°C]), in Rush Creek and the Project reservoirs (Waugh, Gem, and Agnew lakes) suitable for cold water salmonid fishes (i.e., rainbow trout, brown trout). The sources for water temperature data include water temperature grab samples from the United States Geological Survey, the California Environmental Data Exchange Network, Rush Creek EA Engineering, Science, and Technology, Inc., and water temperature loggers installed by SCE May 2022/23 to December 2022/23 at seven low elevation locations, and loggers installed June 2023 to October 2023 at four high-elevation locations as part of the AQ 3 – TSR (Table AQ 3-1 and Map AQ 3-1) (SCE 2024d). In addition, water temperature profiles from Silver Lake and Project reservoirs were collected monthly from June to October, 2023 (Silver Lake) and July through October, 2023 (Waugh, Gem, and Agnew lakes) (AQ 3 – TSR; SCE 2024d). Additional water quality data (e.g., turbidity, dissolved oxygen) are discussed in the AQ 4 – TSR (SCE 2024f) and Section 8.3, Water Quality and briefly summarized below.

**Rush Creek**

Water temperature data collected in 2022 and 2023 indicated that water temperatures remained below 20°C (average daily) through the sampling period, with temperatures correlated with elevation (AQ 2 – TSR, Figure 3-1, [SCE 2024d]). The warmest location in the valley floor was Rush Creek upstream of Grant Lake near river mile 13.7 (7,190 feet above mean sea level [msl]) with a maximum daily average water temperature of 19°C in 2022 and 15°C in 2023 (wet water year). Rush Creek Powerhouse tailrace (7,258 feet above msl) maximum average daily temperature was 17.7°C in 2022 and <14°C in 2023. The high-elevation sites typically had a daily average below 13°C in 2023, with water temperature decreasing as monitoring sites increased in elevation. Monthly average, minimum, and maximum temperatures for each location, including individual figures for each site, are provided in the AQ 3 – TSR (SCE 2024d).

**Project Reservoirs and Silver Lake**

Water temperature data collected in 2023 found that Silver, Gem, and Agnew lakes were typically stratified during the summer and fall (AQ 2 – TSR, Figures 3-2 to 3-6, [SCE 2024d]). Overall, lake water temperatures were cold (<20°C, suitable for cold water salmonids) with the maximum water temperature in the epilimnions <15°C. The hypolimnion of Gem Lake was particularly cold, ~4°C, and deep (~300 meters). Storage in Waugh Lake is temporary and occurs when the spring / early summer inflows exceed the capacity of the low-level outlets (low-level outlets are left open all year long); therefore, no measurement of reservoir water temperature was conducted.

**Water Quality**

Water quality sampling conducted in 2023 as part of the AQ 4 – TSR indicate that the physical and water chemistry conditions in the vicinity of the Project are of high quality (i.e., cold, high oxygen, no contaminates) and conform to regulatory water quality objectives and standards related to aquatic species, except in the case of some natural watershed characteristics (e.g., instances of low pH, low alkalinity, higher total dissolved solids [TDS]) (SCE 2024f). The primary determinant of water quality in the watershed appears to be geological characteristics such as slow weathering granitic/volcanic geology in the upper watershed (e.g., above Gem Dam) that corresponds to water quality that is low in specific conductivity, salinity, alkalinity, pH, and TDS, whereas the faster weathering marine sedimentary geology in the lower watershed (at Agnew Dam and below) corresponds with water that is higher in specific conductivity/salinity, alkalinity, pH, and TDS. Bacterial sampling in Gem and Agnew lakes indicated that the water is free from *E. coli* (≤1 most probable number/100 milliliters) contamination. Additional information on water quality is provided in Section 8.3.

#### 8.4.5.2 Gradient, Channel Geometry, and Riparian Vegetation

Watershed geology dictates the Rush Creek gradient and affects the channel geometry and riparian vegetation. The upper watershed, Rush Creek upstream of the Rush Creek Powerhouse, is characterized by glacially formed, steep gradient, bedrock dominated, high-elevation sub-basins (>7,200 feet msl). The lower watershed, Rush Creek below the powerhouse, is comprised of a lower gradient, low elevation valley floor (<7,200 feet msl).

Table 8.4-1 and Figure 8.4-1 show the different sections of Rush Creek and the steep gradient from the powerhouse upstream to Waugh Lake (6.9 percent) and lower gradient from the powerhouse downstream to Mono Lake (0.9 percent). The lower-gradient sub-sections are less confined with a broader floodplain. The steeper-gradient sub-sections are confined within bedrock and have a very narrow floodplain. The steepest stream sections are dominated by bedrock cascade and plunge pool channels with limited riparian development (e.g., gradient typically >4 percent). The lower-gradient sections have adjustable alluvial channels and well-developed riparian vegetation (see Section 8.7, Geomorphology and Section 8.8, Wetlands, Riparian, and Littoral Habitats).

#### 8.4.5.3 Channel Geomorphology and Sediment

Details of the Project study area geomorphology are included in Section 8.7, Geomorphology. Overviews of the fine sediment, spawning gravel abundance, and bankfull flows are discussed below. Reaches assessed during the geomorphology study are shown in Map 8.7-1.

**<u>Fine Sediment</u>**

Fine sediment in pools was generally limited to a small portion of the residual pool volume. In 21 of the 25 sampled pools, V* values were less than 0.10, indicating very little fine sediment storage. Reach-weighted average V*w values were equal to or less than 0.15 for all sampled reaches, indicating minor fine sediment storage in the Project-affected streams. Fine sediment within potential spawning riffles was generally within the size criteria to support high reproductive success (Section 8.7, Geomorphology; AQ 5 – TSR [SCE 2024e]).

**<u>Spawning Gravel Abundance</u>**

Spawning gravel habitat was limited in the study area due to the high gradient nature of the watershed. However, of the 25 samples collected from potential spawning gravel habitat, all were within the typical size range of spawning material typically used by trout (Section 8.7, Geomorphology; AQ 5 – TSR [SCE 2024e]).

## Bankfull Flows

The discharge calculated for the field identified bankfull elevations varies considerably on the four different mainstem Rush Creek reaches (AQ 5 – TSR; SCE 2024e).

- At Rush Creek Below Rush Meadows Dam the reach average bankfull flow is 263 cubic feet per second (cfs).
- At Rush Creek Below Agnew Dam, the average is 39 cfs and 68 cfs for Rush Creek Upstream of Reversed Creek Confluence (54 cfs on average).
- Rush Creek Upstream of Reversed Creek Confluence, the average bankfull flow for the reach is 68 cfs, except at the lower most transect where field observation indicated a relatively low bankfull flow that may be affected by backwater conditions at higher flows, and thus is considered an outlier and not representative of the reach conditions.
- Bankfull flow increases to 281 cfs for the most downstream reach analyzed, Rush Creek below Silver Lake.

### 8.4.5.4 Hydrology and Instream Flow Habitat

### Hydrology

A detailed description of Rush Creek stream and reservoir hydrology is included in Section 8.2, Water Use and Hydrology.

A synopsis of existing hydrology conditions is provided below.

- Waugh Lake under existing conditions varies from a lentic water body (water stored) to riverine (flowing channel) annually. The low-level outlets are left open year-round and storage only occurs when the spring / early summer inflows exceed the capacity of the low-level outlets (Section 8.2, Figure 8.2-1).
- Rush Creek below Rush Meadows Dam under existing conditions has a FERC-required minimum flow of 10 cfs or natural flows (whichever is less). The flow gage has a sporadic record (Section 8.2, Figure 8.2-5) and was not summarized tabularly; however, modeled existing condition flows show that the lowest flows occur September to January with median flows of less than 5 cfs. May and June flows are the highest, because of spills, with a median monthly flow of 106 to 120 cfs. Intermediate flows occur in early spring and fall (AQ 2 – TSR, Table AQ 2-5 [SCE 2024b]).
- Gem Lake under existing conditions typically fills in the spring and remains full until after Labor Day, after which, storage is released for power generation and the reservoir reaches its lowest elevation prior to spring refill. Under the current seismic restrictions, it has a maximum storage capacity of 10,752 acre-feet (ac-ft)

and maximum elevation of 9,027.5 feet (Section 8.2; AQ 2 – TSR, Table AQ 2-3; and Figure 8.2-1).

- Rush Creek below Gem Dam under existing conditions has a FERC-required minimum flow of 1 cfs, or natural flows (whichever is less) when the reservoir is below the dam face. Measured flow releases have always been 1 cfs or greater. In the spring/early summer there are spills from the reservoir, but they do not show up in the minimum flow gage data as the gage only measures the minimum flow release. Average monthly minimum flow releases at the gage were typically 1 to 2 cfs, but in some of the high flow months, May, June, and September, average monthly flow was higher (18, 19, and 17 cfs) (Section 8.2, Table 8.2-6). Modeled median monthly flows show a value of 1 to 2 cfs for all months except during few spill months (AQ 2 – TSR, Table AQ 2-5 [SCE 2024b]).

- Agnew Lake under existing conditions does not store water, inflows pass through notches cut (2017) in the bottom of the dam. There is a natural lake below the dam level that has a maximum storage capacity of 26 ac-ft and maximum elevation of 8,470 feet (AQ 2 – TSR; SCE 2024b).

- Rush Creek below Agnew Dam has a FERC-required minimum flow of 1 cfs or natural flow if less, but higher flows occur during spring high flow season due to runoff and spills from Gem Lake (Section 8.2, Table 8.2-7). Average mean monthly flows from April through July range from 13 to 81 cfs. Downstream of Horsetail Falls, Rush Creek splits at a natural bifurcation and some flow goes into the ungagged South Rush Creek channel (AQ 2 – TSR, Figure AQ 2-7 [SCE 2024b]).

- Rush Creek below the Rush Creek Powerhouse includes flows from Rush Creek, South Rush Creek, Reversed Creek, and two unnamed tributaries. The Rush Creek gage downstream of Silver Lake (also includes Alger Creek) shows that average monthly flows range from 48 cfs in January to 187 cfs in June (Section 8.2, Table 8.2-9).

### Instream Flow Habitat

A new instream flow study (including a review of historical studies) was conducted in Project reaches to characterize aquatic and riparian habitat and channel maintenance as a function of flow, and results are provided in the AQ 1 – TSR (SCE 2024a) and summarized below.

#### *PREVIOUS INSTREAM FLOW MODELING STUDY*

The instream flow modeling that was developed during the previous relicensing effort (EA Engineering, Science, and Technology 1986) in Rush Creek below Rush Meadows Dam showed that optimal weighted usable area (WUA) for juveniles and fry of both target species (rainbow and brook trout) was determined to be between 5 and 20 cfs (mostly below 10 cfs). Flows above 10 cfs further reduce habitat for the juvenile life stages of both species. Optimal WUA for adult rainbow and brook trout was higher, in the 30 to 60 cfs range. Optimal WUA for adult rainbow trout was reached at higher flows than optimal WUA for adult brook trout. Maximum WUA spawning habitat for both target species occurred between 90 and 100 cfs (AQ 2 – TSR; SCE 2024a).

### *CURRENT INSTREAM FLOW MODELING STUDY*

Data collection for hydraulic and aquatic habitat modeling was completed in representative mesohabitat types in the various study reaches to support 1-D hydrodynamics and habitat models. 2-D models were used in areas where other issues such as channel enhancement/restoration or sediment scour/deposition were also being addressed. In plunge pool habitats, empirical hydraulic and habitat data was collected because the plunge pools were not suitable for hydraulic modeling. Reaches assessed during the instream flow modeling study are shown in Map 8.4-3.

#### HABITAT VERSUS FLOW MODELING

For adult trout, SCE used two model runs in each reach to help differentiate in-bank versus out-of-bank habitat. For one run, the adult substrate habitat suitability criteria (HSC) were set to zero for vegetation (modified runs) and for the other the HSC were held at full suitability for vegetation (e.g., grass, willow, shrub, gravels, cobbles). In the case of adult habitat, the discussion below focuses on the modified HSC results (in-bank habitat) (AQ 2 – TSR; SCE 2024b). Adult trout habitat versus flow relationships (Figures 8.4-3 through 8.4-6) shows inflection points in the habitat versus flow relationships occur at the following flow ranges (i.e., increased flow provides less habitat increase):

- Rush Creek below Gem Dam to Reverse Creek: 20–25 cfs
- Rush Creek above Silver Lake: 40–50 cfs
- Rush Creek below Silver Lake: 45–60 cfs
- South Rush Creek: 20–30 cfs

Trout spawning habitat versus flow relationships were different at each of the modeling sites due to channel hydraulics and spawning gravel availability. Typically, there was less spawning habitat than adult habitat. The maximum amount of spawning habitat (in channel) occurred at approximately the following flows:

- Rush Creek below Gem Dam to Reverse Creek: 10 cfs
- Rush Creek above Silver Lake: No spawning habitat because the channel is deep and low gradient with a predominately sand bed
- Rush Creek below Silver Lake: 55 cfs
- South Rush Creek: 15 cfs

**HABITAT TIME SERIES MODELING**

A habitat time series analysis (daily habitat from 1990–2021) was developed for each of the Project reaches and for each trout life stage (adult, juvenile, fry and spawning habitat). Exceedance plots (by month) of the daily habitat is shown in Figures 8.4-11 through 8.4-14 for existing conditions and Proposed Project daily average flows. Overall, there is very little difference in the habitat between the two scenarios. This occurs because the existing condition flows and Proposed Project flows in each of the reaches (Below Gem Dam, Above Silver Lake, Below Silver Lake, and South Fork Rush Creek) are very similar (see Hydrology above).

### 8.4.5.5 Fish Barriers and Migration

The steep gradients in Rush Creek frequently create natural upstream barriers for fish and the Project dams and other anthropogenic features add some additional barriers (AQ 6 – TSR; SCE 2024c). Natural barriers such as waterfalls, chutes, and cascades were abundant in Rush Creek upstream of the Rush Creek Powerhouse to below Agnew Dam, between Gem Dam and Agnew Lake, below Rush Meadows Dam, and above Waugh Lake. In total, four natural barrier reaches, five individual natural barriers, and five anthropogenic barriers were documented along Rush Creek from the upstream influence of Grant Lake to approximately 0.5 mile upstream of Waugh Lake (Map 8.4-2, Table 8.4-3).

Anthropogenic barriers were assessed quantitatively and categorized based on relative passage restriction for trout (Table 8.4-3). Complete barriers, those categorized as not passable, consisted of infrastructure unsuitable for the passage of trout (Gem Dam and Rush Meadows Dam and the notches cut into Agnew Dam in 2017). Natural barriers occurred below all three anthropogenic complete barriers, limiting the area impacted. Although the design of the notches in Agnew Dam could allow for passage at some flows, the presence of a large cascade immediately downstream further restricts potential passage.

Two gage weirs (the SCE gage below Agnew Lake and the Los Angeles Department of Water and Power gage below Silver Lake) were assessed and determined to be potentially passable for adult trout at some flows but presented jump and velocity barriers to juvenile trout at all flows and depth barriers to adult trout at low flows. Critical riffles at the upstream end of Agnew Lake and Waugh Lake present depth barriers only under seasonal low-flow conditions. Therefore, they are likely to primarily effect fall spawning species such as brook trout. The critical riffle at the upstream end of Silver Lake (in the Rush Creek sediment delta) is affected by lake surface elevation and inflow. This critical riffle did not present a depth barrier in 2023 but could reach critically shallow depths when the lake surface elevation approaches 7,220.5 feet and inflow is low.

## 8.4.6 General Aquatic Community

### 8.4.6.1 Reservoirs

CDFW has discontinued stocking of Waugh Lake in 1965 in favor of a self-sustaining fishery. Gem and Agnew lakes are managed as stocked lakes with “put and grow” fisheries; aerially planted annually with fingerling rainbow trout (100 lbs/10,000 fish). Silver Lake is managed as a stocked lake with both “put and take” and “put and grow” fisheries. It is stocked with rainbow trout triploid catchable trout weekly/bi-weekly; Lahontan cutthroat trout diploid fingerlings once annually. The stocking allotment is 25,000 rainbow-catchable (12,500 lbs); 10,000/100 Eagle Lake trout-fingerling; 10,000/100 Lahontan cutthroat trout-fingerling (Grahm Meese, pers. comm. 2024).

Reservoir fish sampling was conducted by SCE in August of 2023 in Gem Lake and Agnew Lake and is reported in the AQ 6 – TSR (SCE 2024c).[1] Variable-mesh gillnets were set in Project reservoirs to characterize fish species composition, relative abundance, size, and body condition.

**Gem Lake**

Gillnet sampling (six variable-mesh gillnets deployed vertically in deep water and horizontally in littoral zone habitats for approximately 22 hours each) captured 18 adult rainbow trout (220–380 millimeters (mm) fork length [FL]) and 6 adult brook trout (210–260 mm FL) (Table 8.4-4) (SCE 2024c). The condition factor of rainbow trout in Gem Lake was 1.10 and the condition factor of brook trout was 0.99, indicating fish in good condition (Table 8.4-5).[2]

**Agnew Lake**

Gillnet sampling (four variable-mesh gillnets deployed vertically in deep water and horizontally in littoral zone habitats for approximately 19 hours each) captured 15 adult brook trout (220–260 mm FL) and 4 adult rainbow trout (220–270 mm FL) (Table 8.4-4) (SCE 2024c). The condition factor of rainbow trout in Agnew Lake was 1.01 and the condition factor of brook trout was 1.06, indicating fish in good condition (Table 8.4-5).

[1] Gill net sampling was not conducted in Waugh Lake as the low-level outlet was open and the area did not represent reservoir habitat. This area is discussed under Section 8.4.6.2.

[2] Fulton’s fish condition factor provides a relative index of the nutritional state (e.g., storage of muscle and lipids) of the fish, but the values of calculated condition factor that represent good or poor nutritional state vary by species, depending on their body shape, and can vary depending on the size (length) of fish within a species. Condition factors for trout can range from <0.6 to >2.0 (Carlander 1969), where starving fish often have a condition factor <0.7 (Reimers 1963; Carlander 1969), and exceptionally healthy fish have high condition factors (e.g., >1.5).

#### 8.4.6.2 Stream Reaches

**Benthic Algae, Macroinvertebrates, Wetted Perimeter**

Benthic algae and macroinvertebrates in Rush Creek were not characterized but are assumed to be consistent with other rivers in the Eastern Sierra Nevada range of the same elevation.

Wetted perimeter versus flow relationships were developed in select stream segments to characterize available habitat for benthic aquatic species (i.e., macroinvertebrates and algae) under different flow regimes. The results show inflection points at approximately 175 cfs, 400 cfs, 75 cfs, and >60 cfs for Rush Creek below Gem Dam, Rush Creek above Silver Lake, Rush Creek below Silver Lake, and South Rush Creek, respectively. Figure 8.4-7 to Figure 8.4-10 shows the wetted perimeter/width results for each of the four reaches assessed.

**Fish**

Multi-pass backpack electrofishing (shallow water) and snorkeling (deep water) was conducted by SCE in September 2023 to characterize fish composition, distribution, abundance, growth, age structure, and condition factor in Project-affected stream segments and one comparison reach in Rush Creek above Waugh Lake. South Rush Creek was not sampled in 2023 as it was dry at the time of the scheduled fish population surveys.

Rainbow trout were the most widely distributed species in Rush Creek and were found in all but the highest elevation stream sampling site above Waugh Lake (Figure 8.4-2). At the historical sampling site in Rush Creek below Rush Meadows Dam, rainbow trout appeared to be mostly rainbow trout x golden trout hybrids as identified in previous studies (Read and Sada 2012). Rainbow x golden trout hybrids were also observed in smaller numbers in Rush Creek below Agnew Dam, above Horsetail Falls. These hybrid fish are referred to as rainbow trout in this analysis (Table 8.4-6).

Brook trout were found from above Silver Lake to the highest elevation stream sampling site above Waugh Lake. Brown trout had the smallest distribution and were found from Rush Creek below Silver Lake (lowest-elevation site) to Rush Creek above Silver Lake, below Horsetail Falls (Figure 8.4-2).

Results from individual sampling sites are discussed in greater detail below. In general, there were differences in growth and length-at-age based on sampling site elevation and species (AQ 6 – TSR; SCE 2024c):

- High-elevation sites: Small rainbow trout (<90 mm) made up a lower proportion of total catch at high-elevation sites compared to lower elevation sites, consistent with the findings of Sada and Rosamond (2010). Small rainbow trout included both 0+ and 1+ juvenile fish. Also, a large proportion of moderate sized brook trout (90–200 mm FL) were observed at higher elevation sites.

- Lower elevations sites: Small (<90 mm FL) rainbow trout and brown trout made up a larger proportion of the catch compared to high-elevation sites. Brown trout at lower elevation sites primarily consisted of small to moderately sized individuals (<175 mm FL), with a small proportion of large individuals. Rainbow trout and brook trout exhibited a more even distribution of fish sizes across sites.

#### *RUSH CREEK - UPSTREAM OF WAUGH LAKE*

Rush Creek upstream of Waugh Lake is high-gradient reference stream reach (not affected by the Project). The reach has historically been known to contain both brook trout and rainbow trout (Erdman 2012). However, during the September 2023 sampling, only brook trout were observed (Table 8.4-6; SCE 2024c). In general, most of the fish captured were greater than 120 mm FL in size. Length frequency histograms are provided in the AQ 6 – TSR, Appendix E (SCE 2024c). Scale sample analysis indicates captured fish were primarily age 1+ juveniles or age 2+ adults, with few smaller juvenile or age 0+ (young-of-the-year [YOY]) fish observed (Table 8.4-7). A length versus weight relationship for brook trout is provided in Figure 8.4-15.

Brook trout density (fish/mile and fish/$ft^2$) and biomass (lbs/acre and lbs/mile) in this reach is shown in Table 8.4-8. Fish density was 1,367 fish/mile and ranged from 743 to 2,253 fish/mile across mesohabitat types and biomass was 17.07 to 59.52 lbs/acre. Condition factors at this site represent fish in good condition, with an average condition factor of 1.07 (Table 8.4-5).

#### *RUSH CREEK - WAUGH LAKEBED*

Rush Creek within the reservoir footprint varies annually from riverine (lotic) in the fall/winter to reservoir (lentic) during the spring/summer when water temporarily stores as inflow exceeds the capacity of the low-level outlets. Habitat conditions in the Waugh lakebed include the variable reservoir water levels, unvegetated banks, and homogenous channel morphology. Sampling conducted during lotic conditions in September 2023 yielded mostly smaller juvenile brook trout under 120 mm FL, with fewer larger adults captured. Length frequency histograms are provided in the AQ 6 – TSR, Appendix E (SCE 2024c). Based on scale samples individuals were primarily ages 0+ and 1+ (Table 8.4-7). A length versus weight relationship for brook trout is provided in Figure 8.4-15.

Fish density and biomass within the Waugh lakebed is shown in Table 8.4-7. Rainbow trout density was calculated at 16 fish/mile and biomass was 0.02 lbs/acre. Due to the small sample (N=1), average condition factors for rainbow trout were not calculated. Brook trout density was calculated at 435 fish/mile and biomass was 1.58 lbs/acre. The average condition factor of brook trout at this site represented fish in good condition, with an average condition factor of 1.13 (Table 8.4-5).

CDFW stocking in Waugh Lake was discontinued in 1965 largely because of the drawdown of the reservoir every winter (Wong, pers. comm. 1992). Brook trout and rainbow trout residing in Rush Creek upstream of Waugh Lake may move into the lake during spring runoff when the reservoir is filling. Because of the lack of overwintering habitat and the absence of seasonal fish plants by CDFW, trout populations in the lake during spring, summer, and fall are low relative to other stocked reservoirs and natural lakes in the area (Wong, pers. comm. 1992).

***RUSH CREEK - RUSH MEADOWS DAM TO GEM LAKE***

Rush Creek between Rush Meadows Dam and Gem Lake is a mix of low-gradient pool-riffle and steep gradient step-pool sections. The reach currently has a FERC-required minimum flow of 10 cfs or natural flows (whichever is less). Natural flows can be very low (<1 cfs). Typically, high flows occur during spring/early summer (e.g., >100 cfs). Because the Rush Meadow dam low-level outlets are left open year-round, flows are natural except during the period when inflows to Waugh Lake exceed the capacity of the low-level outlets.

The Rush Creek fish assemblage below Rush Meadows Dam includes a self-sustaining population of brook trout and rainbow trout (mostly rainbow trout x golden trout hybrids) and supports a moderate to good recreational fishery (Chubb, pers. comm. 1992). Both species were observed in this reach during sampling conducted in September 2023 (Table 8.4-6; SCE 2024c).

Most of the fish observed in this reach were moderately sized brook and rainbow trout between 90- and 210-mm FL (AQ 6 – TSR, Appendix E [SCE 2024c]). Ages from scale sample analysis ranged from 1+ to 3+ (Table 8.4-7). YOY fish (age 0+) were not observed during 2023 surveys. Sada (2003) concluded that spawning and recruitment were minimal in this reach of stream because of naturally low base flow during winter limiting spawning success and high springtime discharge washing young fish downstream. These conditions appear to continue making this portion of Rush Creek a harsh environment for trout (Read and Sada 2012).

Density and standing crop estimates from 2023 sampling conducted at the legacy sampling site below Rush Meadows Dam were compared to historical sampling data from 1999–2002 and 2010 (Read and Sada 2012, Sada 2001b, Sada 2003; Table 8.4-9). Brook trout density was higher in 2023 than in previous sampling years at 907 fish/mile. However, standing crop (biomass density) was not as high at only 18.08 lbs/acre. Historical brook trout density and standing crop ranged from 128 fish/mile and 3.57 lbs/acre to 784 fish/mile and 30.33 lbs/acre. Rainbow trout density and biomass in 2023 (291 fish/mile, 8.39 lbs/acre) was mid-range in 2023 compared to historical sampling, which ranged from 96 fish/mile and 3.57 lbs/acre to 320 fish/mile and 13.38 lbs/acre.

Average condition factors were 1.09 for rainbow trout and 0.97 for brook trout (Table 8.4-5).

### *RUSH CREEK - GEM DAM TO AGNEW LAKE*

This extremely steep (almost 30 percent) gradient reach is known to contain brook trout and rainbow trout (Erdman 2012). Minimum instream flow is 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. Habitat is primarily plunge pools. Numerous natural fish passage barriers exist throughout the reach. This reach was included in fish passage surveys but not included in fish population surveys.

### *RUSH CREEK - AGNEW DAM TO VALLEY FLOOR (RUSH CREEK POWERHOUSE)*

Directly below Agnew Dam is a steep, bedrock-dominated reach that flows down to the valley floor over Horsetail Falls. Agnew Dam was notched at the base in 2017 and is no longer used for storing water or power generation. The surface elevation of Agnew Lake now remains near natural (pre-project) levels. Rush Creek below Agnew Dam has a FERC-required minimum flow of 1 cfs or the natural inflow when the level of Agnew Lake falls below the level of the face of the dam (which is the current condition).

Sampling conducted in September 2023 above Horsetail Falls (RC18.55) and above Rush Creek Powerhouse (RC17.55), below Horsetail Falls. Rainbow trout and brook trout were observed above Horsetail Falls during sampling; rainbow trout, brown trout, and brook trout were observed below Horsetail Falls (Table 8.4-7; SCE 2024c).

Above Horsetail Falls, most rainbow trout captured during electrofishing were greater than 120 mm FL in size, with fewer smaller fish captured (AQ 6 – TSR, Appendix E [SCE 2024c]). Juvenile and adult fish (ages 1+ to 3+) were observed based on scale sample analysis (Table 8.4-7). Rainbow trout observed during snorkeling were typically in the 3- to 12-inch size range with two fish in the 12–18-inch size class. In general, most brook trout captured during electrofishing at this site were juveniles (ages 0+, 1+) below 100 mm FL or adults (2+) between 135 mm to 180 mm FL (Table 8.4-7; AQ 6 – TSR, Appendix E [SCE 2024c]). Brook trout observed during snorkeling were in the 3–12-inch size class (one larger fish) (AQ 6 – TSR, Appendix E [SCE 2024c]).

Fish density is shown in Table 8.4-8. Across all mesohabitat types sampled, rainbow trout density was 470 fish/mile and ranged from 40 to 88 fish/mile and biomass was 7.57 to 50.76 lbs/acre. Brook trout density was 3,034 fish/mile and ranged from 1,839 to 4,413 lbs/acre and biomass was 67.73 to 140.72 lbs/mile.

Condition factors in Rush Creek above Horsetail Falls represent fish in good condition. Rainbow trout had an average condition factor of 1.06, and brook trout had an average condition factor of 1.02 (Table 8.4-5).

Below Horsetail Falls (RC17.55), rainbow trout captured during electrofishing included juveniles with ages estimated from 0+ to 1+ and adults ages 2+ and 3+ based on scale sample analysis (Table 8.4-7; AQ 6 – TSR [SCE 2024c]). Brook trout captured during electrofishing included juveniles and adults from 60 to 270 mm FL. Most brown trout observed were juveniles 90 mm FL or smaller (AQ 6 – TSR, Appendix E [SCE 2024c]).

Fish density and biomass below Horsetail Falls and above Rush Creek Powerhouse is shown in Table 8.4-8. Electrofishing, rainbow trout density was 611 fish/mile and ranged from 172 to 805 fish/mile and biomass was 8.63 to 79.41 lbs/acre. Brook trout density was 611 fish/mile and ranged from 287 to 966 fish/mile and biomass was 20.99 to 87.93 lbs/acre. Brown trout density was 1,177 fish/mile ranged from 632 to 1,609 fish/mile and biomass was 8.63 to 79.41 lbs/acre.

Fish captured by electrofishing in Rush Creek below Horsetail Falls were in good condition. Rainbow trout had an average condition factor of 1.02, brown trout had an average of 1.05, and brook trout had an average of 0.97 (Table 8.4-7).

***RUSH CREEK - RUSH CREEK POWERHOUSE TO SILVER LAKE***

Rush Creek below Rush Creek Powerhouse above Silver Lake is a lower gradient, sinuous, sand-bedded, unconfined meadow reach that receives flows from powerhouse releases, Rush Creek, Reversed Creek, and other small tributaries. Drift snorkeling was performed below State Route 158 (SR-158) and Silver Lake in September 2023. Rainbow trout, brown trout, and brook trout were observed in this reaches during sampling (Table 8.4-6; SCE 2024c).

During snorkeling, rainbow trout were observed in the 0–18-inch size range, brown trout were observed in all size classes (0–3 inches, 3–6 inches, 6–12 inches, 12–18-inches, 18 inches+), and brook trout were only observed in the 0–3-inch size class (AQ 6 – TSR, Appendix E [SCE 2024c]).

Density of fish was low. During snorkel surveys, brook trout density was 81 fish/mile and ranged from zero (none observed) to 53 fish/mile and biomass ranged from zero to 0.03 lbs/acre. Rainbow trout density was 54 fish/mile and ranged from zero to 168 fish/mile and biomass ranged from zero to 25.73 lbs/acre. Brown trout density was 81 fish/mile and ranged from zero to 182 fish/mile and biomass ranged from zero to 37.35 lbs/acre (Table 8.4-8; SCE 2024c).

***RUSH CREEK - SILVER LAKE TO GRANT LAKE***

Rush Creek below Silver Lake is comprised primarily of outflow from Silver Lake (minimal accretion flows enter Rush Creek below Silver Lake). Project operations above Silver Lake influence flows into Silver Lake and, because Silver Lake is a natural lake (no storage), the flows out of Silver Lake are also affected by the Project. Silver Lake does absorb inflow fluctuations to some extent and outflows are modified by the presence of the lake. The river reach below Silver Lake is low gradient (<0.6 percent), has abundant riparian vegetation, and there is large woody debris in the reach.

Rainbow trout and brown trout were observed in the reach (RC13.9) during September 2023 sampling in similar proportions (Table 8.4-6; AQ 6 – TSR [SCE 2024c]). Few fish larger than 6+ inches were observed. This reach is heavily fished as it is easily accessible (adjacent to SR-158) and near camping area. Likely there is size selective removal of fish from this reach. Rainbow trout observed during electrofishing and snorkeling consisted primarily of juveniles (likely YOY) smaller than 85 mm FL. Older juveniles (age 1+) and a few adults were also observed (Table 8.4-7; AQ 6 – TSR, Appendix E [SCE 2024c]). Similarly, most brown trout observed during electrofishing and snorkeling were juveniles (likely YOY approaching age 1+) smaller than 90 mm FL (Table 8.4-7; AQ 6 – TSR, Appendix E [SCE 2024c]).

Rainbow trout density was 2,876 fish/mile and ranged from 1,520 to 6,437 fish/mile and biomass ranged from.088 to 24.43 lbs/acre. Brown trout density was 3,271 fish/mile and ranged from 1,441 to 5,886 fish/mile and biomass ranged from 4.87 to 19.87 lbs/acre (Table 8.4-8; SCE 2024c).

Fish captured by electrofishing at this site were in good condition. Rainbow trout had an average condition factor of 1.13 and brown trout had an average of 1.08 (Table 8.4-6).

CDFW manages this reach with a shorter fishing season (Saturday preceding Memorial Day through September 30) and lower bag / possession limit (5 trout) and has annual stocking allotment 10,000 rainbow trout / 5,000 lbs.

**Species Life Stage Periodicity**

A fish life stage periodicity (or life-history chronology) chart by month for species in the sampling sites was developed based on available literature (Moyle 2002; Read and Sada 2012), discussion with qualified fisheries biologists, and review of the 2023 fish population sampling information (Table 8.4-10). Periodicities were adjusted based on Project elevation and associated environmental factors (e.g., water temperature), where appropriate.

The total number of YOY fish sampled or observed in the study area was relatively small. YOY of autumn-spawning trout (brown and brook) for 2023 were not available for capture at the time of sampling, and all 0+ fish of these species were almost a full year old at the time of capture. YOY rainbow trout spawned in 2023 were available for capture, although they were uncommon at high-elevation sites where recruitment is relatively low (Read and Sada 2012). The highest numbers of YOY were observed in the valley floor below Silver Lake and below Rush Creek Powerhouse, respectively.

Based on the life stage periodicity chart and the age classes observed, rainbow trout likely spawn from March through June in the study area, with hatching occurring during June and July. Brown and brook trout hatching likely spawn in the fall and early winter months, with hatching beginning in February.

### 8.4.7 Entrainment and Associated Mitigation

Sada (2001a) assessed trout mortality caused by entrainment at the Gem and Agnew Lake intakes through the Rush Creek Powerhouse turbines during 11 consecutive months in 1998/1999, and six consecutive months in 2000. A total of 156 brook trout and 35 rainbow trout were captured during 2,208 hours of sampling in 1998/1999. The high mortality and the large size of fish suggested that fish had free access into the Gem Lake Intake. Inspections during March 1999 revealed a large, V-shaped gap in the intake “screen” (debris barrier) that covered the intake structure in Gem Lake. The gap measured approximately 3 feet across at its widest point and allowed fish unimpeded access into the penstock. The gap was repaired during April 2000 and another set of trials was conducted from May through October 2000 (1,008 sampling hours). During that period, a total of 21 brook trout and one rainbow trout mortalities were recorded. Calibration trials found that fyke nets captured 98 percent of the fish passing through Rush Creek Powerhouse turbines.

The annual estimated mortality during 1998 and 1999 was 857.4 fish (694.5 brook trout and 160.3 rainbow trout). After the intake “screen” was repaired, estimated annual mortality in 2000 was 194.9 fish (183.7 brook trout and 8.7 rainbow trout). Differences in mortality observed before and after the repair indicated that the barrier substantially reduce fish entrainment.

To mitigate for lost trout due to turbine mortality, SCE agreed to stock six hundred catchable-sized (0.5 to 1.0 pound each) rainbow trout into nearby Silver Lake in 2004, to mitigate for 200 fish lost in each of the next 3 years of Project operation (2002–2004). SCE also agreed to stock 1,000 catchable-sized (0.5 to 1.0 pound each) rainbow trout into Silver Lake in 2009 and every 5 years thereafter (for the life of the FERC license) (SCE 2002).

### 8.4.8 Special-Status Aquatic Species

Three special-status aquatic species, SNYLF, YT, and LCT, have potential to be present in the vicinity of the Project. Designated critical habitat exists within the FERC Project boundary for SNYLF and YT.

Field surveys to document the presence of defined primary constituent elements and conduct visual encounter surveys for SNYLF and YT in the study area were conducted in July and August 2023. The study sites, survey methods, and detailed results are described in the AQ 7 – TSR (SCE 2024g). The study area contains potential breeding and non-breeding habitat for SNYLF and YT, however no individuals of any life stage were observed in the study area during the 2023 visual encounter survey.

LCT may be present in lower reaches of the Project as they have been historically stocked in Grant Lake; however, no LCT were observed during fish population studies in the study area.

### 8.4.9 References

Carlander, K.D. 1969.Handbook of Freshwater Fishery Biology, Volume 1. Iowa State University Press. pp. 752.

CDFW (California Department of Fish and Wildlife). 2016. Habitat Management Land Rush Creek Management Unit, Herps Dataset. October 10, 2016.

Chubb, S. 1992. Biologist, Forest Service, Bishop, California. Personal communication January 22, 1992, as cited in FERC 1992.

CNDDB (California Natural Diversity Database). 2020. RareFind, Version 5.0. Online Database. California Department of Fish and Wildlife, Version 5.1.1. Accessed November 20, 2020.

CRWQCB (California Regional Water Quality Control Board, Lahontan Region). 2021. Water Quality Control Plan for the Lahontan Region, North and South Basins (Basin Plan). Revised September 2021. Available at: https://www.waterboards.ca.gov/lahontan/water_issues/programs/basin_plan/references.html.

EA Engineering, Science, and Technology, Inc. 1986. Instream flow and fisheries studies for the upper Rush Creek Hydroelectric Project. Lafayette, California, November 1986. 30 pp.

———. 1987a. Addendum 1 to instream flow and fisheries studies for the Rush Creek Hydroelectric Project. Lafayette, California, November 1987. 45 pp.

———. 1987b. East side Sierra hydroelectric relicensing studies: Effects of unscreened intakes on fish populations in reservoirs. Lafayette, California. August. 10 pp.

Erdman Jr., E. Eastern Sierra Back Country Fishing Guide. 2012. California Department of Fish and Game; March 27, 2012. Available from: https://nrm.dfg.ca.gov/FileHandler.ashx? DocumentID=44660.

FERC (Federal Energy Regulatory Commission). 1992. Environmental Assessment for Hydropower License. Rush Creek Project No. 1389. FERC eLibrary No. 19920604-0017.

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

Forest Service (United States Forest Service). 2001. Management Direction for the Ansel Adams, John Muir and Dinkey Lakes Wildernesses. Final Environmental Impact Statement. April.

_____. 2017. Natural Resource Information System. Online database. Accessed December 15, 2017.

———. 2019a. Inyo National Forest Species of Conservation Concern. June.

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

Grahm Meese. 2024. CDFW. Personal communication with Name, Title, Affiliation, on Month Day.

Lund, L. 1988. Water quality of Bishop Creek and selected eastern Sierra Nevada lakes. Report of Research for 1986 to 1988. SCE. 110 pp.

Moyle, P.B. 2002. Inland fishes of California. University of California Press, Berkeley. 502 pp.

Read, E. and D. Sada. 2012. Analysis of Riparian Vegetation, Aquatic Habitat, and Fish Populations, Phase 2 (Year 1) and Comparison to Baseline. Prepared for Southern California Edison Co.

Reimers, J.B. 1963. Body condition, water temperature, and over-winter survival of hatchery-reared trout in Convict Creek, California. *Transactions of the American Fisheries Society* 92(1):39-46.

Sada, D.W. 2001a. Turbine-induced Trout Mortality During 1998–2000 Rush Creek, Mono County, California. Prepared for SCE by Desert Research Institute 2215 Raggio Parkway, Reno, Nevada.

———. 2001b. Fish population surveys in Rush and Lee Vining Creeks, Mono County, California, 1999 and 2000. Unpublished report to Southern California Edison Company. Rosemead, California.

———. 2003. Aquatic habitat monitoring, Rush and Lee Vining Creeks, Mono County, California, 1999, 2000, 2001, and 2002. Unpublished report to Southern California Edison Company. Rosemead, California.

Sada, D. and C. Rosamond. 2010. Fish population surveys in Rush and Lee Vining Creeks, Mono County, California, 1999 and 2000. Unpublished report submitted to Southern California Edison Company. Rosemead, California.

SCE (Southern California Edison Company). 2002. Filing to FERC Feb 25 (via Electronic Filing) Fish Entrainment at SCE's Rush Creek Hydro Project (FERC 1389).

_____. 2024a. Draft AQ 1 – Instream Flow Technical Study Report. August. Available in Supporting Document A of the Application for New License.

_____. 2024b. Draft AQ 2 – Hydrology Technical Study Report. August. Available in Supporting Document A of the Application for New License.

_____. 2024c. Draft AQ 6 – Fish Population and Barriers Technical Study Report. August. Available in Supporting Document A of the Application for New License.

_____. 2024d. Draft AQ 3 – Water Temperature Technical Study Report. August. Available in Supporting Document A of the Application for New License.

_____. 2024e. Draft AQ 5 – Geomorphology Technical Study Report (Part A). August. Available in Supporting Document A of the Application for New License.

_____. 2024f. Draft AQ 4 – Water Quality Technical Study Report. August. Available in Supporting Document A of the Application for New License.

_____. 2024g. Draft AQ 7 – Special-Status Amphibians Technical Study Report. August. Available in Supporting Document A of the Application for New License.

USFWS (United States Fish and Wildlife Service). 2020. Information for Planning and Consultation (IPaC). Online Database. Accessed November.

Wong D. 1992. Fisheries Biologist, CDFG, Bishop, California. Personal communication December 30, 1991, and January 21, 1992, as cited in FERC 1992

# TABLES

### Table 8.4-1. Study Area Stream and Lake Reaches

| Reach Name | Fish Population Site ID | Reach Length (miles) / River Mile (RM) | Elevation Range (feet) (% gradient) | Description |
|---|---|---|---|---|
| **Rush Creek** | | | | |
| Rush Creek above Waugh Lake | RC23.9 | -- | -- | Rush Creek above Waugh Lake |
| Waugh Lakebed | RC23.4 | 1.51 (RM 22.24–23.75) | 9,376.4–9,444 (0.85%) | Project Reservoir Lakebed |
| Rush Creek Below Rush Meadow Dam | RC21.65 | 1.83 (RM 20.41–22.24) | 9,036–9,376.4 (3.52%) | Moderate Gradient Mountain Stream |
| Rush Creek Below Gem Dam | -- | 0.30 (RM 19.18–19.48) | 8,539.2–9,008 (29.60%) | Steep Mountain Stream |
| Rush Creek Below Agnew Dam, above Horsetail Falls | RC18.55 | 0.40 (RM 18.2–18.60) | 8,214–8,460 (11.65%) | Steep Mountain Stream |
| Rush Creek Horsetail Falls | -- | 0.54 (RM 17.66–18.2) | 7,306.8–8,214 (31.82%) | Steep Mountain Stream |
| Rush Creek below Horsetail Falls and above Silver Lake, above State Route 158 | RC17.55 | 0.94 (RM 16.72–17.66) | 7,216.2–7,306.8 (1.83%) | Low-Gradient Meadow Stream* |
| Rush Creek above Silver Lake below State Route 158 | RC17.05 | 0.94 (RM 16.72–17.66) | 7,216.2–7,306.8 (1.83%) | Low-Gradient Meadow Stream* |
| Rush Creek below Silver Lake | RC13.9 | 2.69 (RM 13.20–15.89) | 7,131–7,214.7 (0.59%) | Low-Gradient Stream |
| South Rush Creek [1] | SRC0.15 | 0.46 (RM 0.0–0.46) | 7,221–7,551.7 (13.62%) | Steep Mountain Stream* |
| **Reservoirs** | | | | |
| Gem Lake | GL | 0.93 (RM 19.48–20.41) | 9,008–9,036 (0.57%) | Project Reservoir |
| Agnew Lake | AL | 0.58 (RM 18.60–19.18) | 8,460–8,539.2 (2.59%) | Project Reservoir |
| Silver Lake | SL | 0.83 (RM 15.89–16.72) | 7,214.7–7,216.2 (0.03%) | Natural Lake |

Notes:

* This stream reach has some very low gradient and some steeper-gradient sections

[1] This site was not sampled in 2023.

## Table 8.4-2. Summary of Fish Species Observed During the 2023 Fish Population Sampling

| Study Site | Date | Fish Species[1] | | |
|---|---|---|---|---|
| | | RBT | BNT | BRK |
| **Stream Segments** | | | | |
| RC23.9 | 9/26/2023 | | | • |
| RC23.4 (Waugh Lakebed) | 9/26/2023 | • | | • |
| RC21.65 | 9/25/2023, 9/27/2023 | • | | • |
| RC18.55 | 9/27/2023 | • | | • |
| RC17.55 | 9/29/2023 | • | • | • |
| RC17.05 | 9/29/2023 | • | • | • |
| RC13.9 | 9/28/2023 | • | • | |
| SRC0.15 | NA [2] | - | - | - |
| **Reservoirs** | | | | |
| Gem Lake | 8/28-8/29/2023 | • | | • |
| Agnew Lake | 8/29-8/30/2023 | • | | • |

[1] RBT = Rainbow Trout, BNT = Brown Trout, BRK = Brook Trout

[2] Not sampled in 2023.

**Table 8.4-3. Rush Creek Barriers to Upstream Migration in the Vicinity of the Project**

| Barrier Name | Barrier Location (river mile) | Elevation Range (feet) (% gradient) | Barrier Type(s) | Natural (Nat) or Anthropo-genic (Anth) | Leap Height (inches) | Minimum Depth (inches) | Plunge Pool Depth (inches) | Fish Passage Category |
|---|---|---|---|---|---|---|---|---|
| FP16 | RM 23.9 | 9,475 | Cascade | Nat | — | — | — | Not Passable |
| FP15 Waugh Lakebed | RM 23.5 | 9,428 | Depth | Nat | NA | 2 | NA | Critical Riffle (Temporary) |
| FP14 Rush Meadow Dam | RM 22.25 | 9,392 | Dam [c] | Anth | NA | NA | NA | Not Passable |
| FP8 – FP13 Rush Creek Below Rush Meadow Dam | RM 20.4 to 20.7 and RM 21.15 to 21.6 | 7.95% and 4.04% | Barriers throughout reach due to steep gradients | Nat | — | — | — | Not Passable |
| FP7 Gem Dam | RM 19.47 | 9,028 | Dam | Anth | NA | NA | NA | Not Passable |
| FP6 – FB7 Rush Creek Below Gem Dam | RM 19.18–19.48 | 8539 –9,008 (29.60%) | Barriers throughout reach due to steep gradients | Nat | — | — | — | Not Passable |
| FP6 Upper Agnew Sediment Delta | RM 19.1 | 8,512 | Depth | Nat | NA | 1 | NA | Not Passable |
| FP5b Agnew Dam (Notches) | RM 18.60 | 8,470 | Dam [c] | Anth | 36 | 1 | 12 | Not Passable [b] |
| FP5a Cascade Below Agnew Dam | RM 18.60 | 8,470 | Cascade | Nat | 13 feet | — | — | Not Passable |
| FP4 Agnew Gage Weir | RM 18.49 | 8,461 | Leap, Depth, Velocity | Anth | 30 | 2 | 36 | Potentially Passable [b] |
| FP3-FP5a Rush Creek Below Agnew Dam | RM 18.2–18.60 | 8,214–8,460 (11.65%) | Barriers throughout reach due to steep gradients | Nat | — | — | — | Not Passable |
| FP3 Rush Creek Horsetail Falls | RM 17.66–18.2 | 7,306.8–8,214 (31.82%) | Barriers throughout reach due to steep gradients | Nat | — | — | — | Not Passable |
| FP2 Upper Silver Lake Sediment Delta | RM 16.5 | 7,240 | Depth | Nat | NA | <6[a] | NA | Critical Riffle (Temporary) |
| FP1 LADWP Gage Weir (below Silver Lake) | RM 13.67 | 7,191 | Leap, Velocity | Anth | 12 | 4 | 12 | Potentially Passable |

Notes:

[a] Minimum depths are dependent on lake surface elevation and were not observed in 2023.

[b] Access to these infrastructure barriers is restricted by natural barriers downstream.

[c] Primary water release points in Agnew and Waugh Dams are valves that are impassable to fish.

## Table 8.4-4. Summary of Fish Species Captured during Reservoir Gill Netting

| Date | Study Site | Total Soaking Time | Number of Fish Captured | |
|---|---|---|---|---|
| | | | Rainbow Trout | Brook Trout |
| **Agnew Lake** | | | | |
| 08/30/2023 | AL-1H | 19.25 | 2 | 10 |
| | AL-1V | 18.5 | - | - |
| | AL-2H | 19.83 | 2 | 5 |
| | AL-2V | 19.08 | - | - |
| | Total | 76.66 | 4 | 15 |
| **Gem Lake** | | | | |
| 08/29/2023 | GL-1H | 22.72 | 7 | - |
| | GL-1V | 21.82 | - | - |
| | GL-2H | 22.5 | 4 | 1 |
| | GL-2V | 21.6 | - | - |
| | GL-3H | 22.33 | 6 | 4 |
| | GL-3V | 21.75 | 1 | 1 |
| | Total | 132.72 | 18 | 6 |

## Table 8.4-5. Condition Factors by Species Collected by Electrofishing and Gillnetting

| Site ID | RBT[2] | | BNT | | BRK | |
|---|---|---|---|---|---|---|
| | Average Condition Factor | n | Average Condition Factor | n | Average Condition Factor | n |
| **Stream Segments** | | | | | | |
| RC23.9 | - | 0 [3] | - | - | 1.07 | 75 |
| RC23.4 (Waugh Lakebed) | 0.84 | 1 | - | - | 1.13 | 14 |
| RC21.65 | 1.09 | 17 | - | - | 0.97 | 38 |
| RC18.55 | 1.06 | 21 | - | - | 1.02 | 87 |
| RC17.55 | 1.02 | 35 | 1.05 | 67 | 0.97 | 41 |
| RC17.05[4] | -- | NA | -- | NA | - | NA |
| RC13.9 | 1.13 | 58 | 1.08 | 168 | - | 0 |
| SRC0.15[5] | - | | - | | - | |
| **Reservoirs** | | | | | | |
| Gem Lake | 1.10 | 18 | - | no fish observed | 0.99 | 6 |
| Agnew Lake | 1.01 | 4 | - | no fish observed | 1.06 | 15 |

Notes:

[1] Captured fish under 50mm in fork length were excluded from condition factor analysis.

[2] RBT = Rainbow Trout, BNT = Brook Trout, BRK = Brook Trout

[3] No rainbow trout were captured at this site.

[4] Snorkel only site. No individual weights were collected to calculate condition factors.

[5] Not sampled in 2023.

## Table 8.4-6. Summary of Fish Sampled at Stream Sampling Sites

| Study Site | Date | Sample Type[1] | Species[2] | | |
|---|---|---|---|---|---|
| | | | RBT | BNT | BRK |
| RC23.9 | 9/26/2023 | E | 0 | - | 77 |
| RC23.4 (Waugh Lakebed) | 9/26/2023 | E | 1 | - | 25 |
| RC21.65 | 9/25/2023, 9/27/2023 | E | 17 | - | 38 |
| RC18.55 | 9/27/2023 | E | 23 | - | 110 |
| | | S | 9 | - | 40 |
| RC17.55 | 9/29/2023 | E | 39 | 75 | 41 |
| RC17.05 | 9/29/2023 | S | 12 | 18 | 2 |
| RC13.9 | 9/28/2023 | E | 0 | 172 | 0 |
| | | S | 83 | 77 | 0 |
| SRC0.15 | NA[3] | - | - | - | - |

Notes:

[1] E = Electrofishing, S = Snorkeling

[2] RBT = Rainbow Trout, BNT = Brown Trout, BRK = Brook Trout

[3] Not sampled in 2023.

## Table 8.4-7. Average Length and Number of Scale Aged Trout at Stream Sampling Sites

| Study Site | Average Length in Millimeters at Age (sample size) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Rainbow Trout | | | | Brown Trout | | | | Brook Trout | | | |
| | 0+ | 1+ | 2+ | 3+ | 0+ | 1+ | 2+ | 3+ | 0+ | 1+ | 2+ | 3+ |
| RC23.9 | 0 | 0 | 0 | 0 | - | - | - | - | 0 | 128 (9) | 205 (1) | 0 |
| RC23.4 (Waugh Lakebed) | 74 (1) | 0 | 0 | 0 | - | - | - | - | 104 (3) | 109 (4) | 171 (3) | 0 |
| RC21.65 | 0 | 116 (7) | 150 (6) | 200 (2) | - | - | - | - | 0 | 122 (6) | 157 (4) | 0 |
| RC18.55 | 0 | 123 (3) | 174 (2) | 201 (2) | - | - | - | - | 0 | 138 (2) | 172 (3) | 0 |
| RC17.55 | 82 (1) | 122 (3) | 157 (2) | 266 (1) | 98 (2) | 112 (4) | 0 | 0 | 98 (2) | 112 (4) | 0 | 0 |
| RC17.05 | - | - | - | - | - | - | - | - | - | - | - | - |
| RC13.9 | 94 (1) | 111 (2) | 238 (1) | 0 | 79 (9) | 0 | 162 (1) | 0 | - | - | - | - |

## Table 8.4-8. Species Density and Biomass at Sampling Sites

| Study Site | Habitat Type | Number of Fish Captured | | | Population Estimate | | | Species[1] Density | | | | | | Species Biomass | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | fish/mile | fish/ft² | fish/mile | fish/ft² | fish/mile | fish/ft² | lbs/acre | lbs/mi | lbs/acre | lbs/mi | lbs/acre | lbs/mi |
| | | RBT | BNT | BRK | RBT | BNT | BRK | RBT | | BNT | | BRK | | RBT | | BNT | | BRK | |
| RC23.9 | MCP | 0 | - | 26 | 0 | - | 28 | 0 | 0.00000 | - | - | 2253 | 0.02168 | 0.00 | 0.00 | - | - | 59.52 | 142.02 |
| | STP | 0 | - | 24 | 0 | - | 24 | 0 | 0.00000 | - | - | 1931 | 0.01715 | 0.00 | 0.00 | - | - | 40.50 | 104.68 |
| | LGR | 0 | - | 15 | 0 | - | 15 | 0 | 0.00000 | - | - | 894 | 0.00794 | 0.00 | 0.00 | - | - | 23.02 | 59.50 |
| | HGR | 0 | - | 12 | 0 | - | 12 | 0 | 0.00000 | - | - | 743 | 0.00715 | 0.00 | 0.00 | - | - | 17.07 | 40.73 |
| | Site Total | 0 | - | 77 | 0 | - | 79 | 0 | 0.00000 | - | - | 1367 | 0.01262 | 0.00 | 0.00 | - | - | 32.86 | 81.72 |
| RC23.4 (Waugh Lakebed) | LGR | 1 | - | 25 | 1 | - | 27 | 16 | 0.00005 | - | - | 435 | 0.00127 | 0.02 | 0.12 | - | - | 1.58 | 12.39 |
| | Site Total | 1 | - | 25 | 1 | - | 27 | 16 | 0.00005 | - | - | 435 | 0.00127 | 0.02 | 0.12 | - | - | 1.56 | 12.25 |
| RC21.65 | HGR | 8 | - | 23 | 8 | - | 33 | 226 | 0.00156 | - | - | 932 | 0.00645 | 5.54 | 18.39 | - | - | 17.12 | 56.80 |
| | MCP | 7 | - | 9 | 7 | - | 14 | 563 | 0.00516 | - | - | 1127 | 0.01032 | 15.79 | 39.56 | - | - | 21.91 | 54.89 |
| | STP | 2 | - | 6 | 2 | - | 6 | 189 | 0.00188 | - | - | 568 | 0.00565 | 12.70 | 29.28 | - | - | 17.86 | 41.20 |
| | Site Total | 17 | - | 38 | 17 | - | 53 | 291 | 0.00226 | - | - | 907 | 0.00703 | 8.39 | 24.87 | - | - | 18.08 | 53.57 |
| RC18.55 | PLP* | 9 | - | 40 | 9 | - | 40 | 414 | 0.00244 | - | - | 1839 | 0.01086 | 39.98 | 155.40 | - | - | 67.73 | 263.25 |
| | LGR | 16 | - | 70 | 16 | - | 85 | 831 | 0.01370 | - | - | 4413 | 0.07278 | 50.76 | 70.65 | - | - | 85.20 | 118.59 |
| | Run | 7 | - | 40 | 8 | - | 88 | 274 | 0.00351 | - | - | 3013 | 0.03865 | 7.57 | 13.55 | - | - | 140.72 | 251.82 |
| | Site Total | 32 | - | 150 | 33 | - | 213 | 470 | 0.00463 | - | - | 3034 | 0.02989 | 31.39 | 73.15 | - | - | 93.91 | 218.81 |
| RC17.55 | HGR | 20 | 40 | 17 | 21 | 43 | 17 | 786 | 0.01238 | 1609 | 0.02535 | 636 | 0.01002 | 36.24 | 52.82 | 9.38 | 13.67 | 30.15 | 43.94 |
| | Run/MCP | 10 | 16 | 15 | 11 | 17 | 15 | 708 | 0.01168 | 1094 | 0.01805 | 966 | 0.01593 | 79.41 | 110.53 | 21.67 | 30.16 | 87.93 | 122.39 |
| | LGR | 3 | 11 | 5 | 3 | 11 | 5 | 172 | 0.00284 | 632 | 0.01043 | 287 | 0.00474 | 8.63 | 12.01 | 9.07 | 12.62 | 20.99 | 29.22 |
| | STP | 6 | 8 | 4 | 6 | 8 | 4 | 805 | 0.01548 | 1073 | 0.02065 | 536 | 0.01032 | 67.14 | 80.10 | 158.59 | 189.20 | 42.40 | 50.59 |
| | Site Total | 39 | 75 | 41 | 41 | 79 | 41 | 611 | 0.01005 | 1177 | 0.01936 | 611 | 0.01005 | 42.00 | 58.63 | 26.30 | 36.72 | 42.28 | 59.02 |
| RC17.05 | MCP* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00000 | 0 | 0.00000 | 0 | 0.00000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Run* | 0 | 3 | 0 | | 3 | 0 | 0 | 0.00000 | 88 | 0.00097 | 0 | 0.00000 | 0.00 | 0.00 | 37.35 | 76.96 | 0.00 | 0.00 |
| | CRP* | 12 | 13 | 0 | 12 | 13 | 0 | 168 | 0.00187 | 182 | 0.00203 | 0 | 0.00000 | 25.73 | 53.02 | 30.93 | 63.73 | 0.00 | 0.00 |
| | CRP/Run* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00000 | 0 | 0.00000 | 0 | 0.00000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | LSP/CRP* | | 2 | 2 | | 2 | 2 | 0 | 0.00000 | 53 | 0.00059 | 53 | 0.00059 | 0.00 | 0.00 | 0.45 | 0.94 | 0.03 | 0.07 |
| | Site Total | 12 | 18 | 2 | 12 | 18 | 2 | 54 | 0.00060 | 81 | 0.00090 | 81 | 0.00090 | 8.28 | 17.07 | 15.81 | 32.57 | 0.01 | 0.01 |
| RC13.9 | MCP* | 83 | 77 | 0 | 83 | 77 | 0 | 1553 | 0.00802 | 1441 | 0.00744 | 0 | 0.00000 | 8.75 | 38.92 | 4.87 | 21.68 | 0.00 | 0.00 |
| | LGR | 37 | 73 | 0 | 140 | 128 | 0 | 6437 | 0.04129 | 5886 | 0.03775 | 0 | 0.00000 | 24.43 | 87.45 | 18.57 | 66.48 | 0.00 | 0.00 |
| | HGR | 16 | 39 | 0 | 17 | 50 | 0 | 1520 | 0.01097 | 4470 | 0.03226 | 0 | 0.00000 | 3.39 | 10.79 | 19.87 | 63.23 | 0.00 | 0.00 |
| | STR | 37 | 60 | 0 | 37 | 60 | 0 | 1418 | 0.00585 | 2299 | 0.00948 | 0 | 0.00000 | 0.88 | 4.90 | 12.88 | 71.70 | 0.00 | 0.00 |
| | Site Total | 173 | 249 | 0 | 277 | 315 | 0 | 2876 | 0.01409 | 3271 | 0.01602 | 0 | 0.00000 | 8.52 | 43.92 | 10.44 | 53.81 | 0.00 | 0.00 |
| SRC0.15 | - | not sampled in 2023 | | | | | | - | | | | | | - | | | | | |

Notes: [1] RBT = Rainbow Trout, BNT = Brown Trout, BRK = Brook Trout

* These sites were sampled by snorkeling. All other sites were sampled by electrofishing.

## Table 8.4-9. Historical Comparison of Species Density and biomass in Rush Creek (Site RC21.65) below Rush Meadows Dam

| Year | Season | Species | Population Estimate | Species Density | | Species Biomass | |
|---|---|---|---|---|---|---|---|
| | | | | fish/mile | fish/ft$^2$ | lbs/acre | lbs/mile |
| 1999 | Summer | BRK | 8 | 128 | 0.001 | 3.57 | 9.74 |
| | | RBT | 6 | 96 | 0.001 | 3.57 | 9.70 |
| | Fall | BRK | 41 | 656 | 0.009 | 29.44 | 48.16 |
| | | RBT | 8 | 128 | 0.002 | 9.81 | 14.42 |
| 2000 | Summer | BRK | 17 | 272 | 0.002 | 7.14 | 32.16 |
| | | RBT | 6 | 96 | 0.001 | 3.57 | 9.86 |
| | Fall | BRK | 44 | 704 | 0.009 | 34.79 | 75.34 |
| | | RBT | 19 | 304 | 0.005 | 23.20 | 39.28 |
| 200[1] | Summer | BRK | 49 | 784 | 0.008 | 30.33 | 67.50 |
| | | RBT | 24 | 384 | 0.005 | 28.55 | 57.02 |
| | Fall | BRK | 34 | 544 | 0.007 | 29.44 | 48.32 |
| | | RBT | 18 | 280 | 0.005 | 34.79 | 45.79 |
| 2002 | Spring | BRK | 37 | 584 | 0.006 | 12.49 | 32.07 |
| | | RBT | 20 | 320 | 0.003 | 13.38 | 33.99 |
| 2010 | Spring | BRK | 35 | 563 | 0.005 | 14.90 | 38.74 |
| | | RBT | 19 | 306 | 0.003 | 14.63 | 27.94 |
| | Summer | BRK | 21 | 334 | 0.003 | 13.56 | 31.08 |
| | | RBT | 9 | 145 | 0.001 | 4.91 | 13.12 |
| 2023 | Summer | BRK | 53 | 907 | 0.007 | 18.08 | 53.57 |
| | | RBT | 17 | 291 | 0.002 | 8.39 | 24.87 |

Notes: BRK = Brook Trout; RBT = Rainbow Trout

## Table 8.4-10. Species and Life Stage Periodicities

| Species Life Stage | Month | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
| **Rainbow Trout** | | | | | | | | | | | | |
| Spawning | | | | | | | | | | | | |
| Incubation | | | | | | | | | | | | |
| Fry | | | | | | | | | | | | |
| Juvenile | | | | | | | | | | | | |
| Adult | | | | | | | | | | | | |
| **Brown Trout** | | | | | | | | | | | | |
| Spawning | | | | | | | | | | | | |
| Incubation | | | | | | | | | | | | |
| Fry | | | | | | | | | | | | |
| Juvenile | | | | | | | | | | | | |
| Adult | | | | | | | | | | | | |
| **Brook Trout** | | | | | | | | | | | | |
| Spawning | | | | | | | | | | | | |
| Incubation | | | | | | | | | | | | |
| Fry | | | | | | | | | | | | |
| Juvenile | | | | | | | | | | | | |
| Adult | | | | | | | | | | | | |

# FIGURES

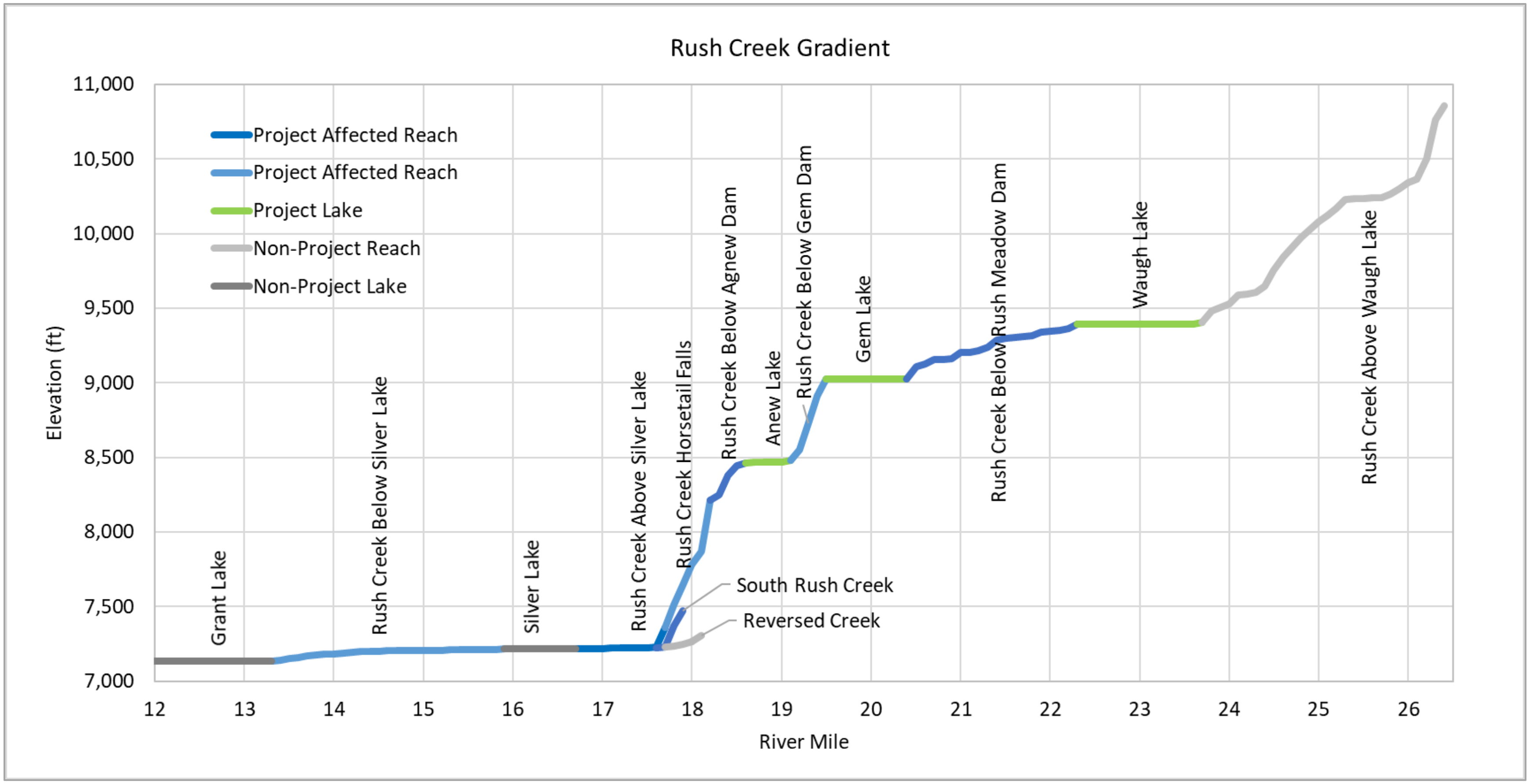



**Figure 8.4-1. Rush Creek Stream and Lake Reaches**

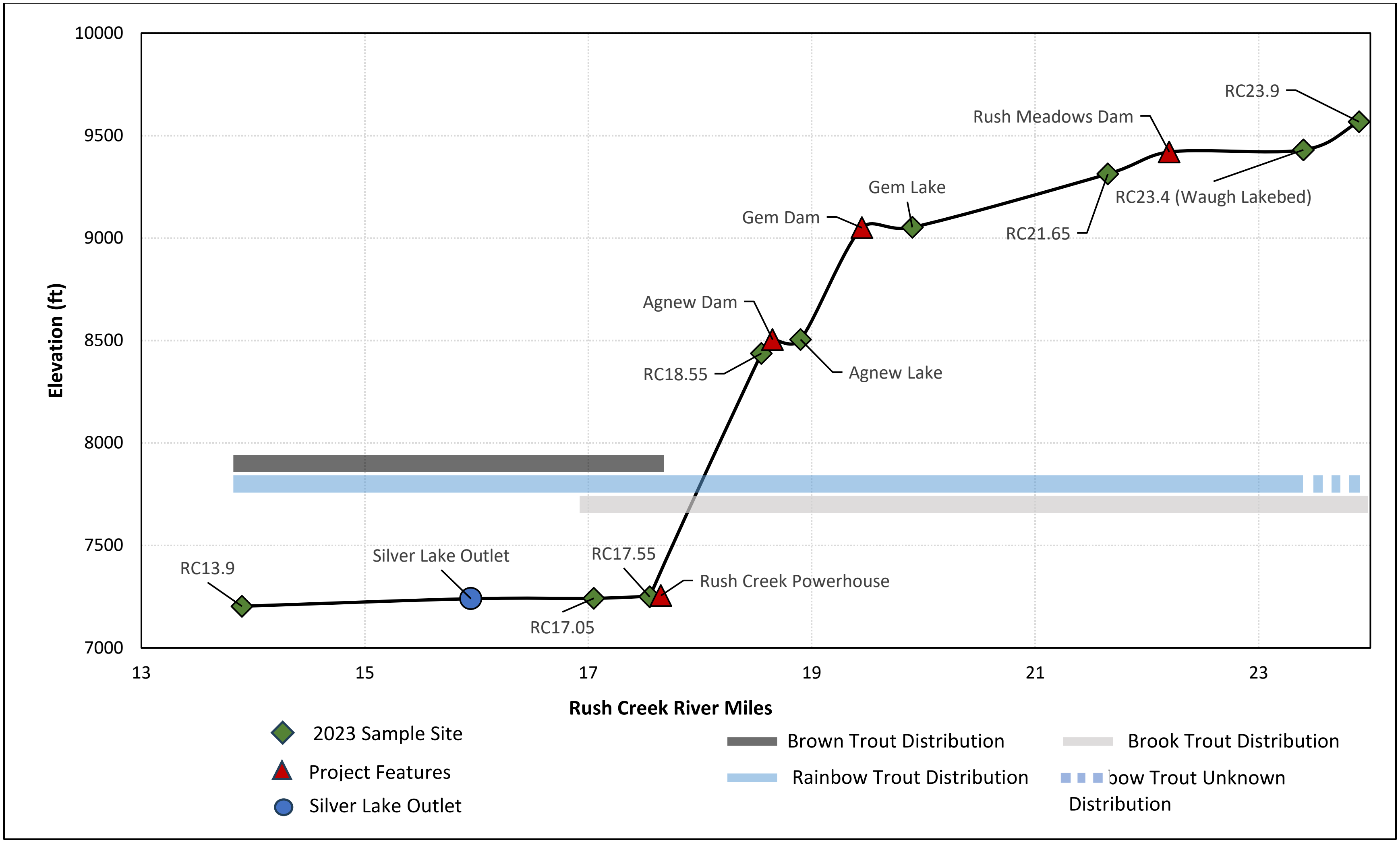



**Figure 8.4-2. Elevation of Sampling Sites on Rush Creek and Fish Species Distribution**

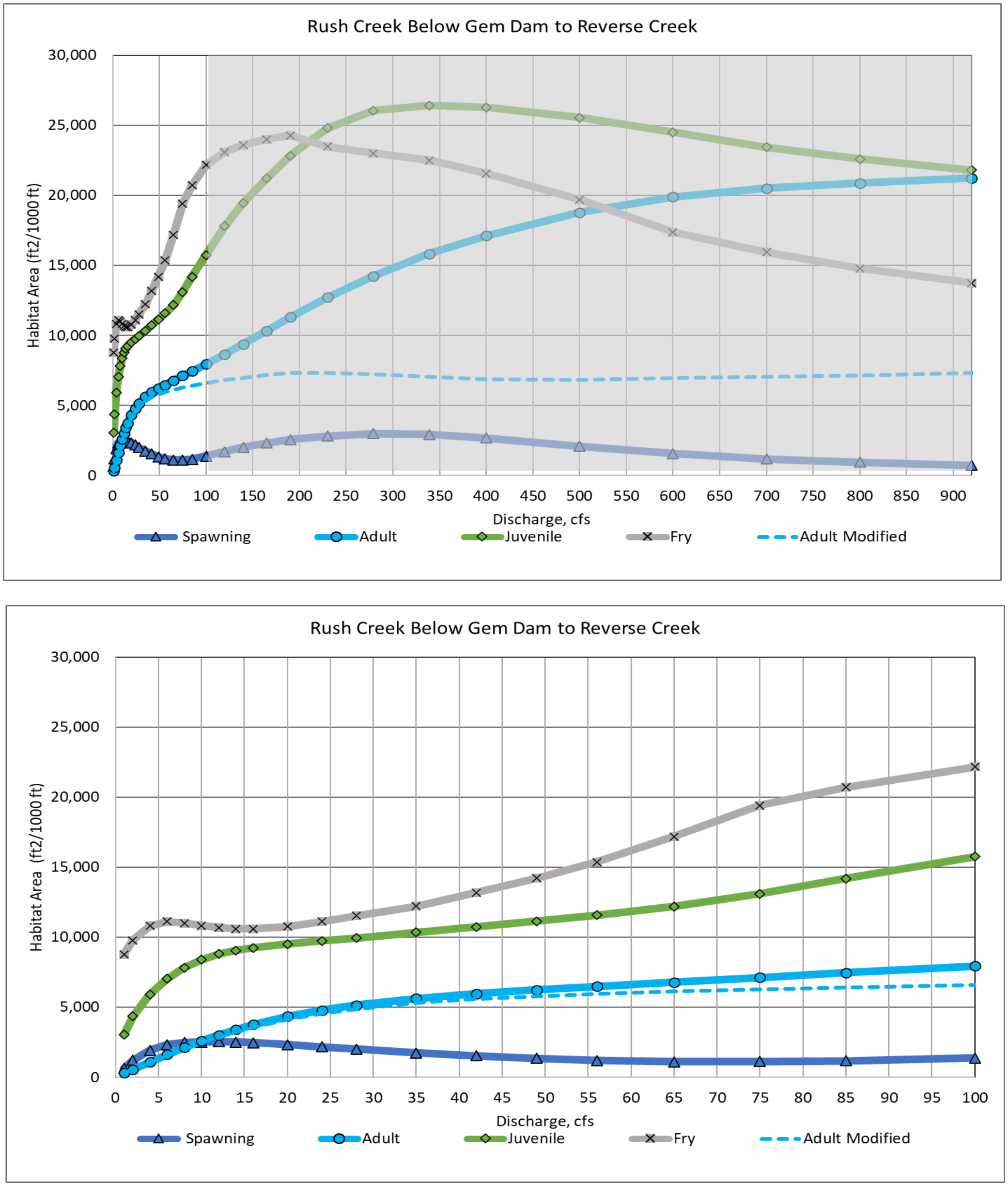



**Figure 8.4-3. Habitat versus flow relationships for Rush Creek below Gem Dam to Reverse Creek shown for the full flow range (top) and a lower flow range (bottom). The grayed area above 100 cfs (top) represents where the habitat modeling is extrapolated substantially above the calibration data and is less accurate.**

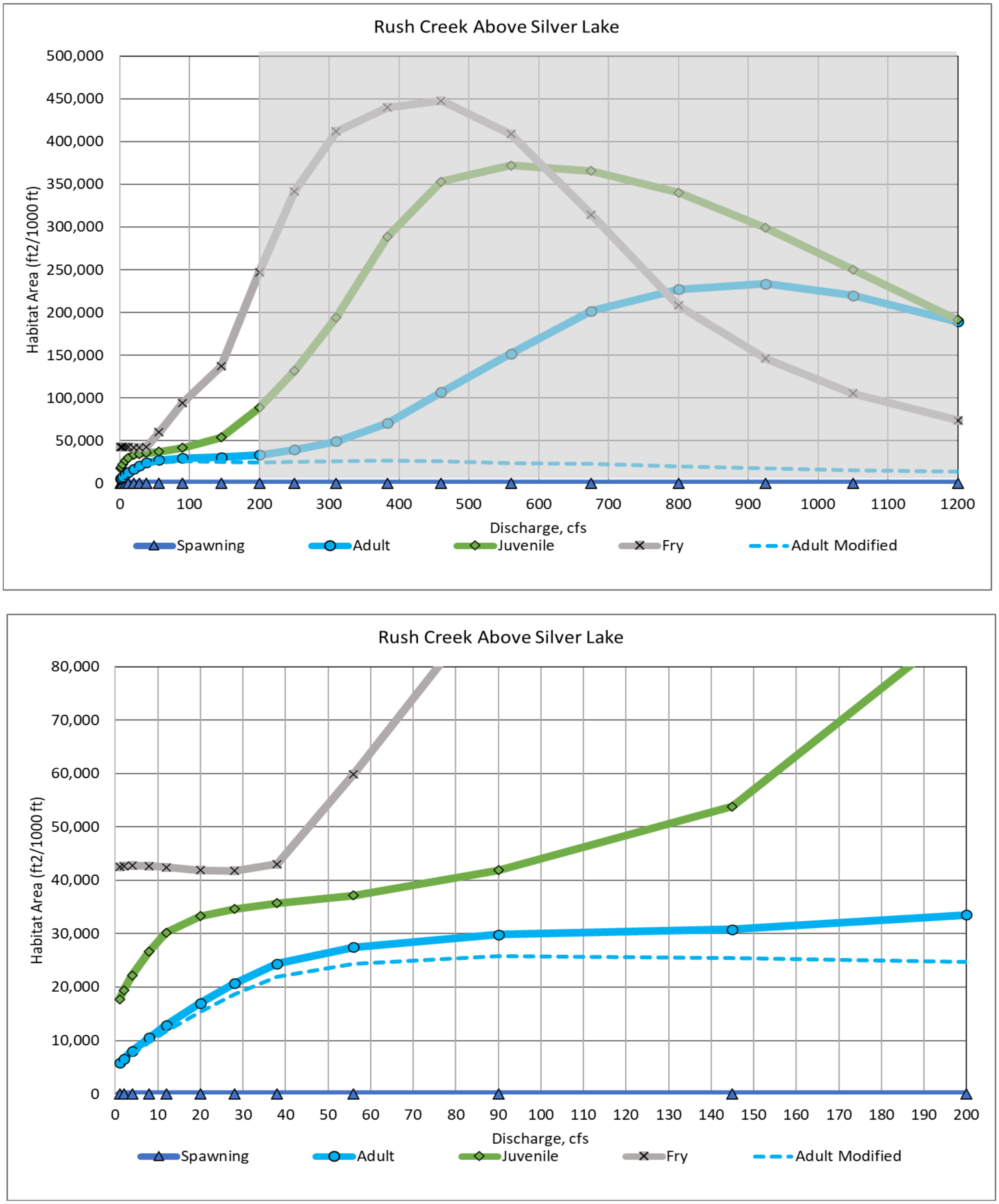
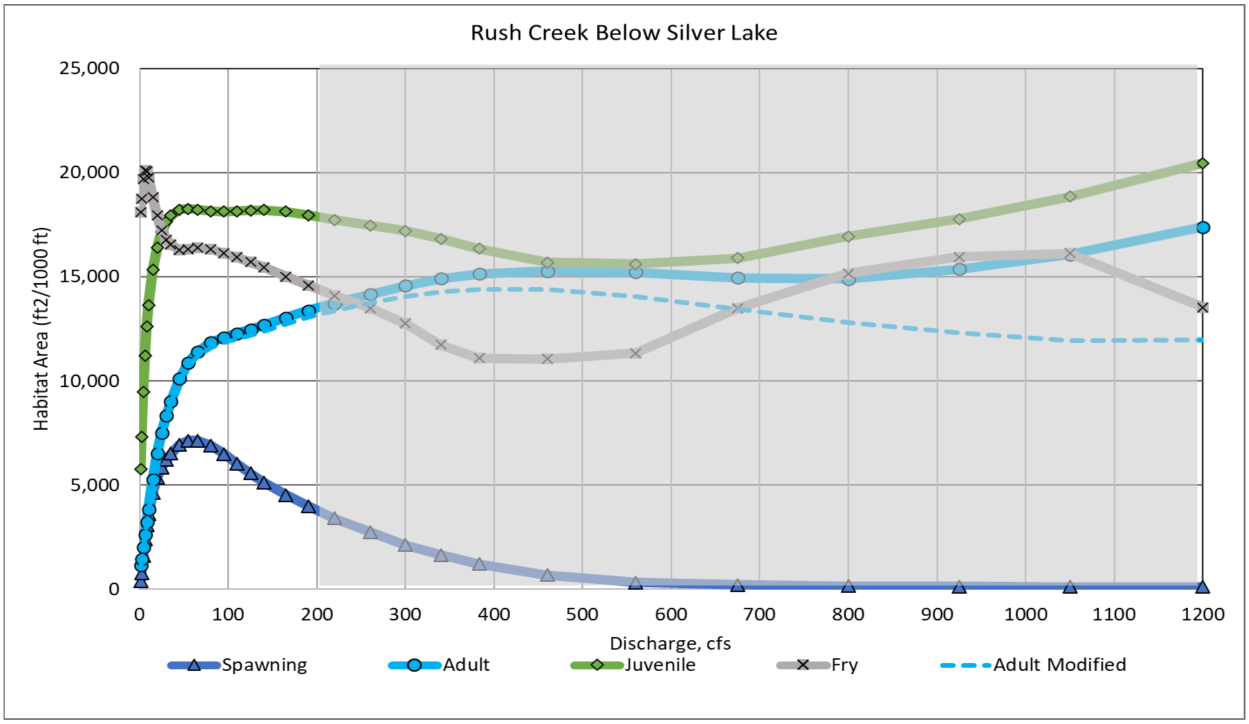



**Figure 8.4-4. Habitat versus flow relationships for Rush Creek above Silver Lake shown for the full flow range (top) and a lower flow range (bottom). The grayed area above 200 cfs (top) represents where the habitat modeling is extrapolated substantially above the calibration data and is less accurate.**



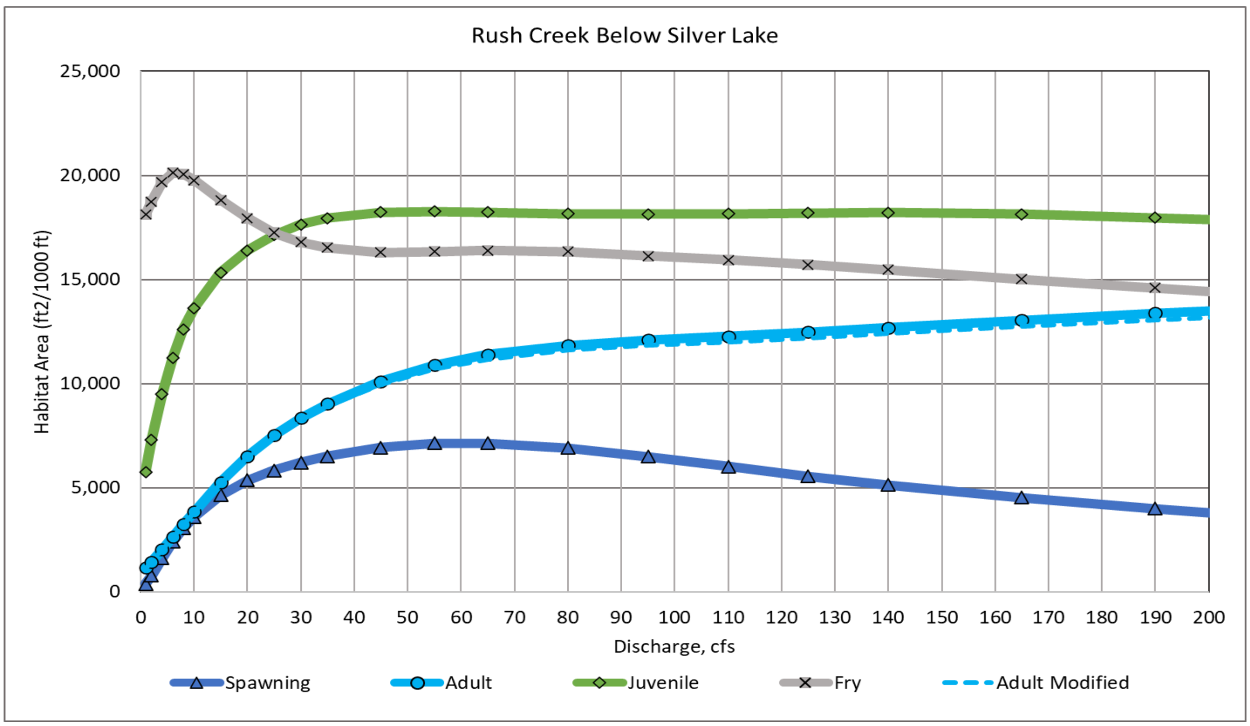
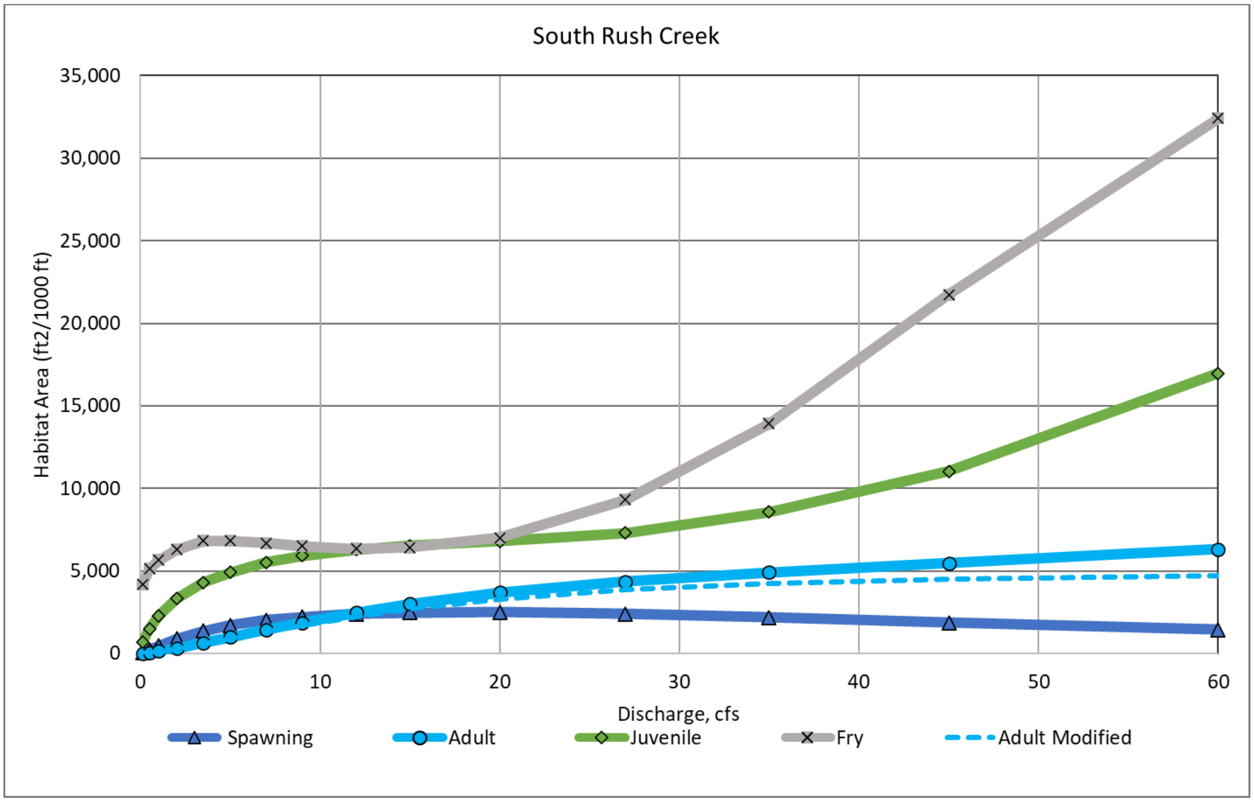




**Figure 8.4-5. Habitat versus flow relationships for Rush Creek below Silver Lake shown for the full flow range (top) and a lower flow range (bottom). The grayed area above 200 cfs (top) represents where the habitat modeling is extrapolated substantially above the calibration data and is less accurate.**



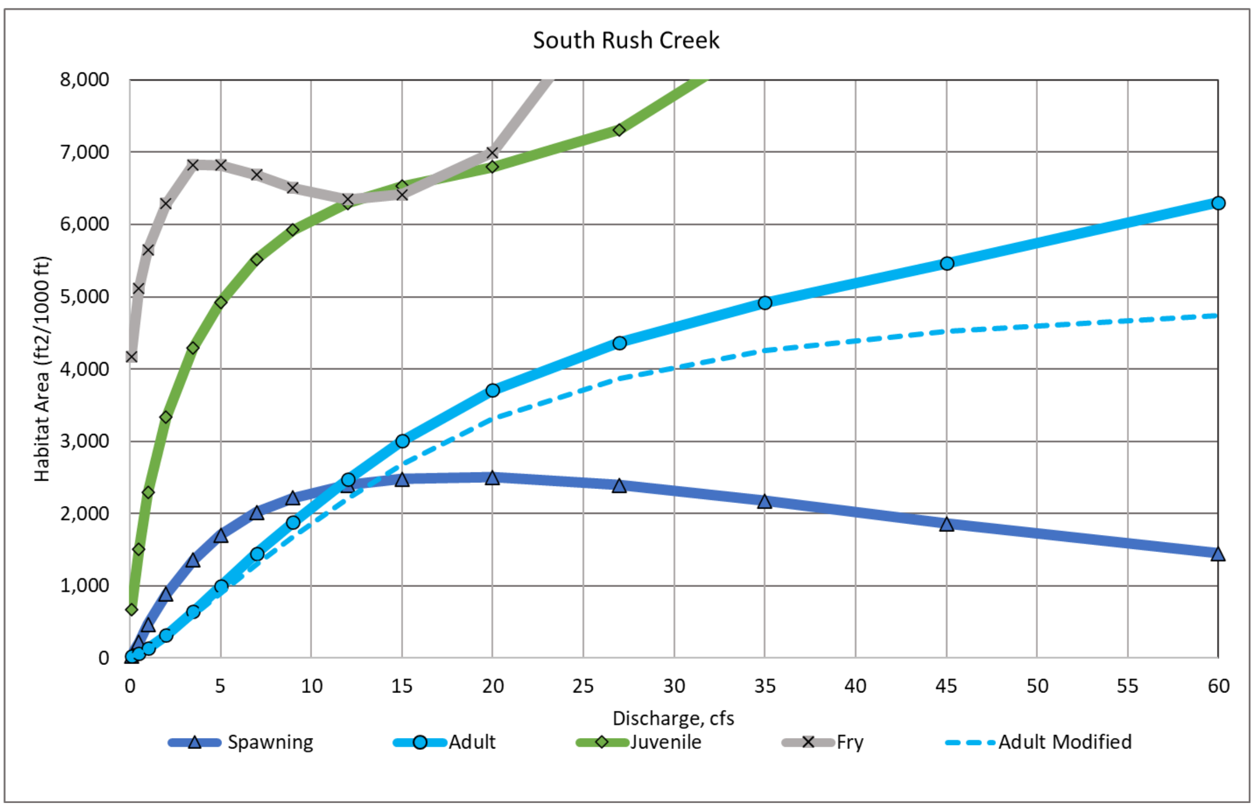




**Figure 8.4-6. Habitat Versus Flow Relationships for South Rush Creek Shown Over the Full Flow Range (top) and a Lower Flow Range (bottom)**

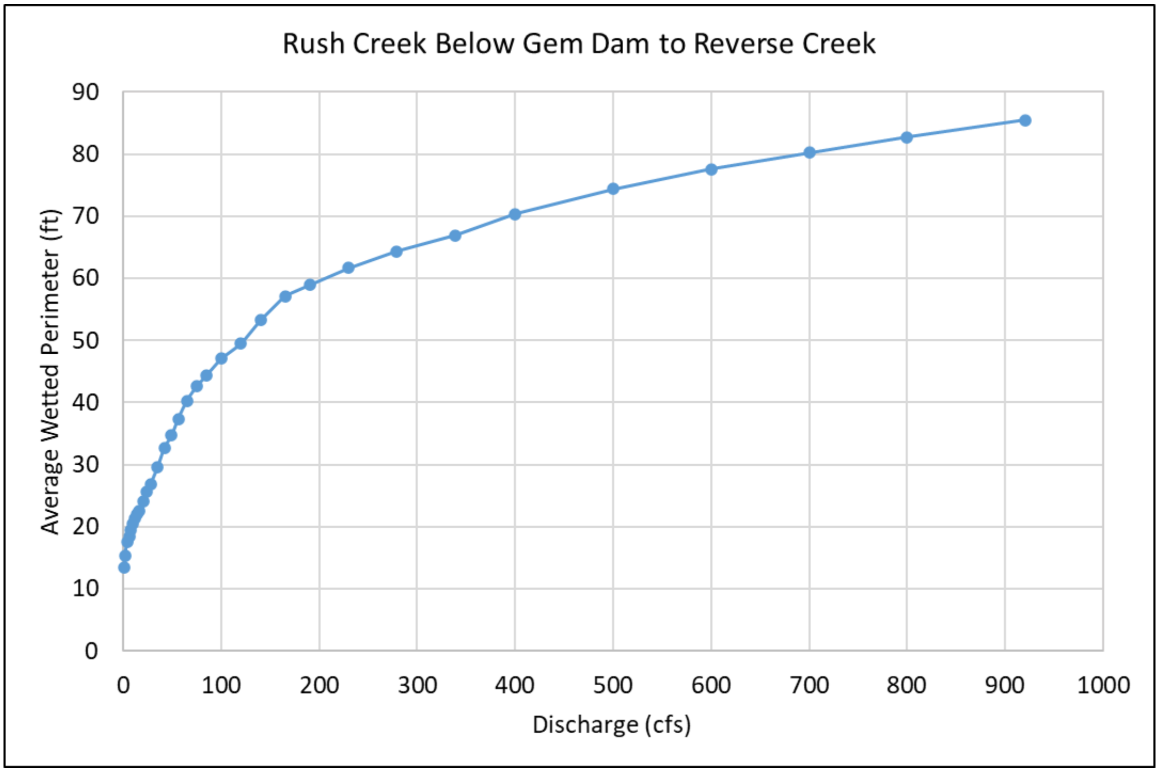



**Figure 8.4-7. Wetted Perimeter for Rush Creek Below Gem Dam to Reverse Creek**

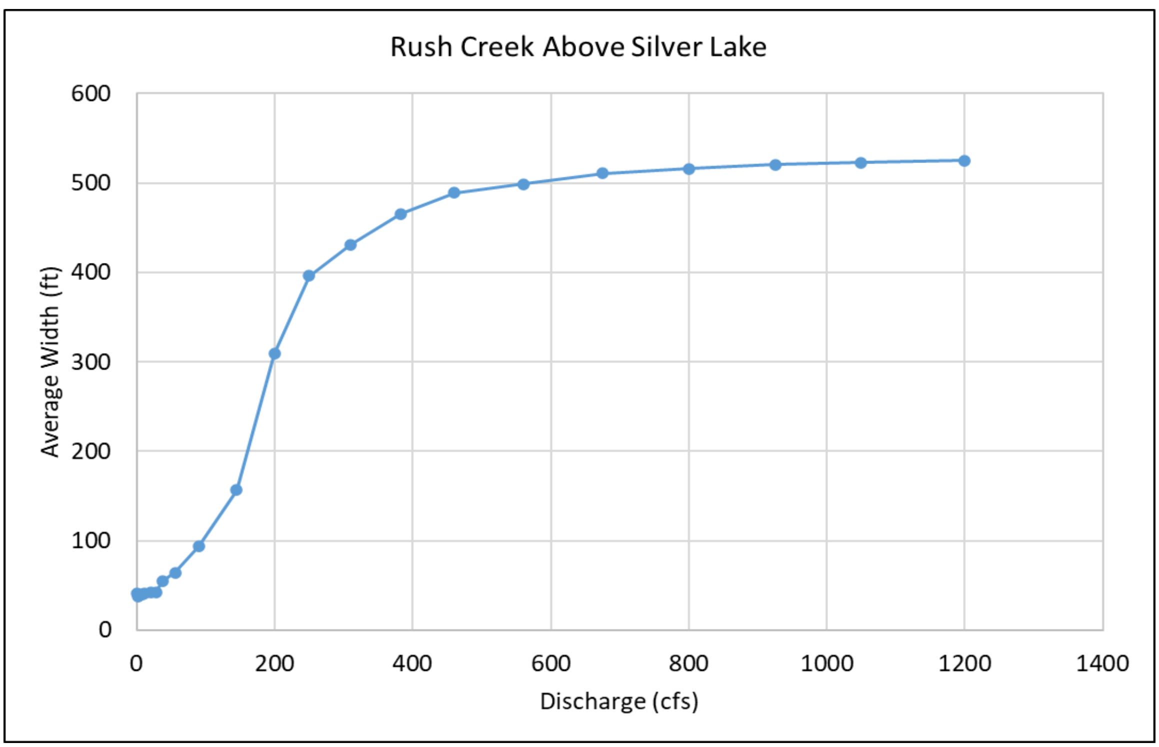



**Figure 8.4-8. Wetted Perimeter for Rush Creek above Silver Lake**

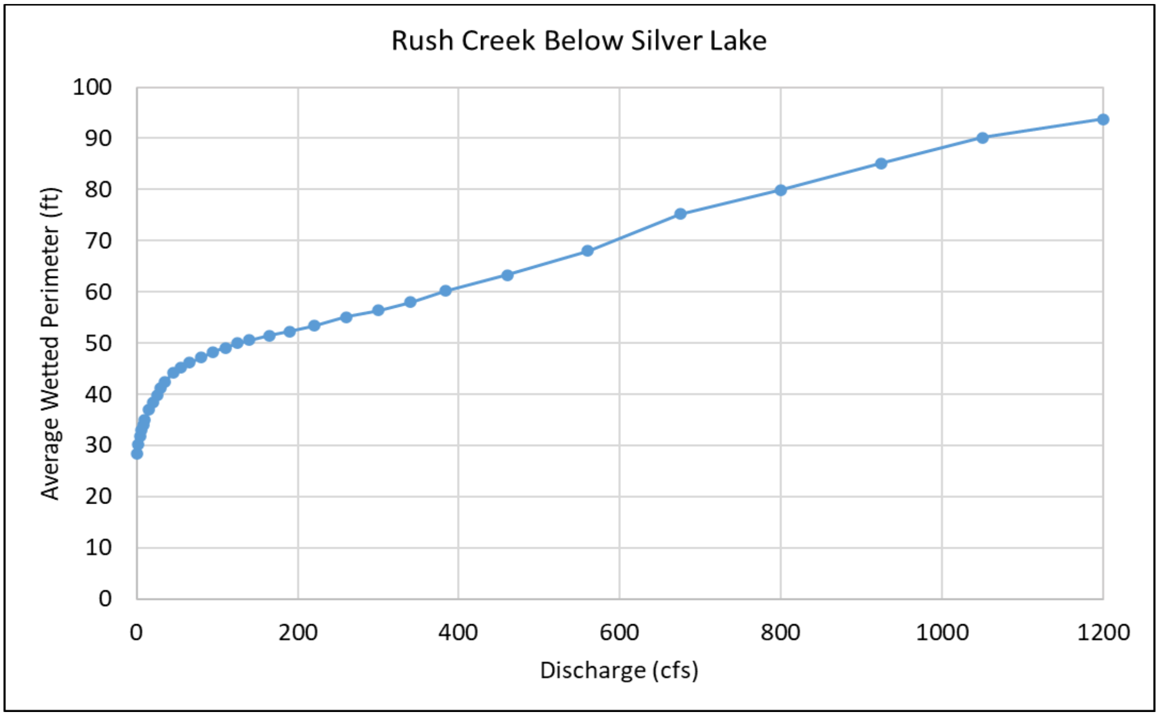



**Figure 8.4-9. Wetted Perimeter for Rush Creek below Silver Lake**

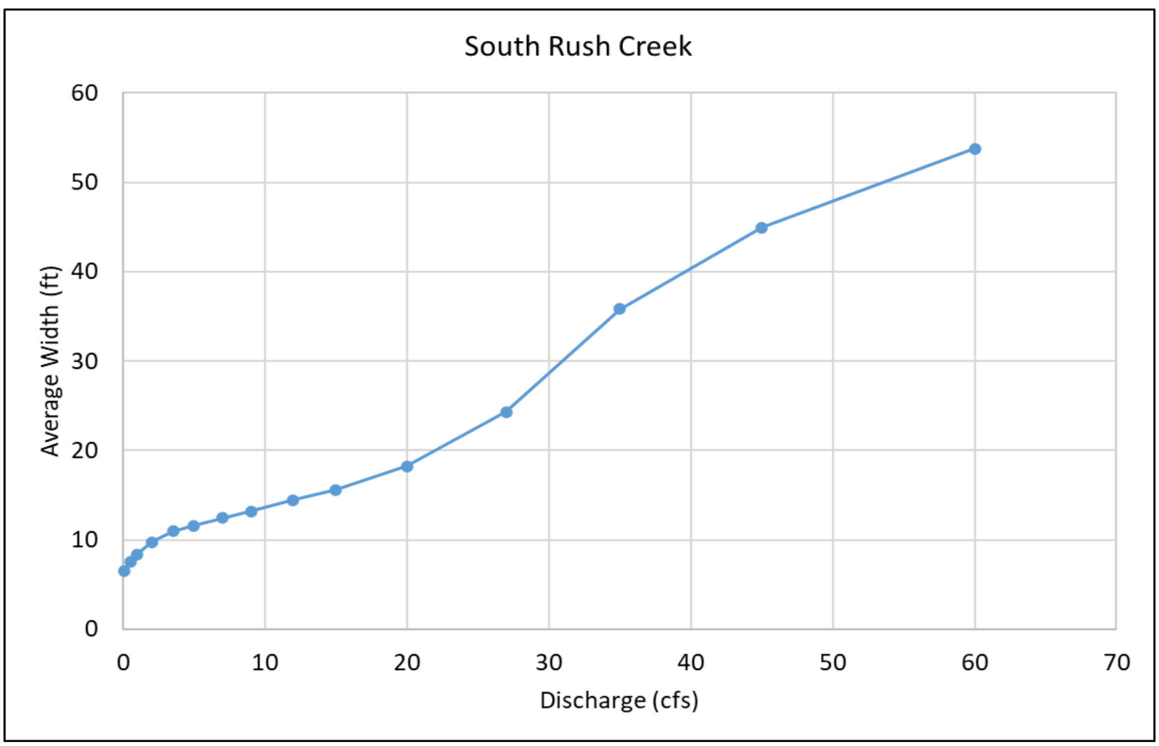



**Figure 8.4-10. Wetted Perimeter for South Rush Creek**

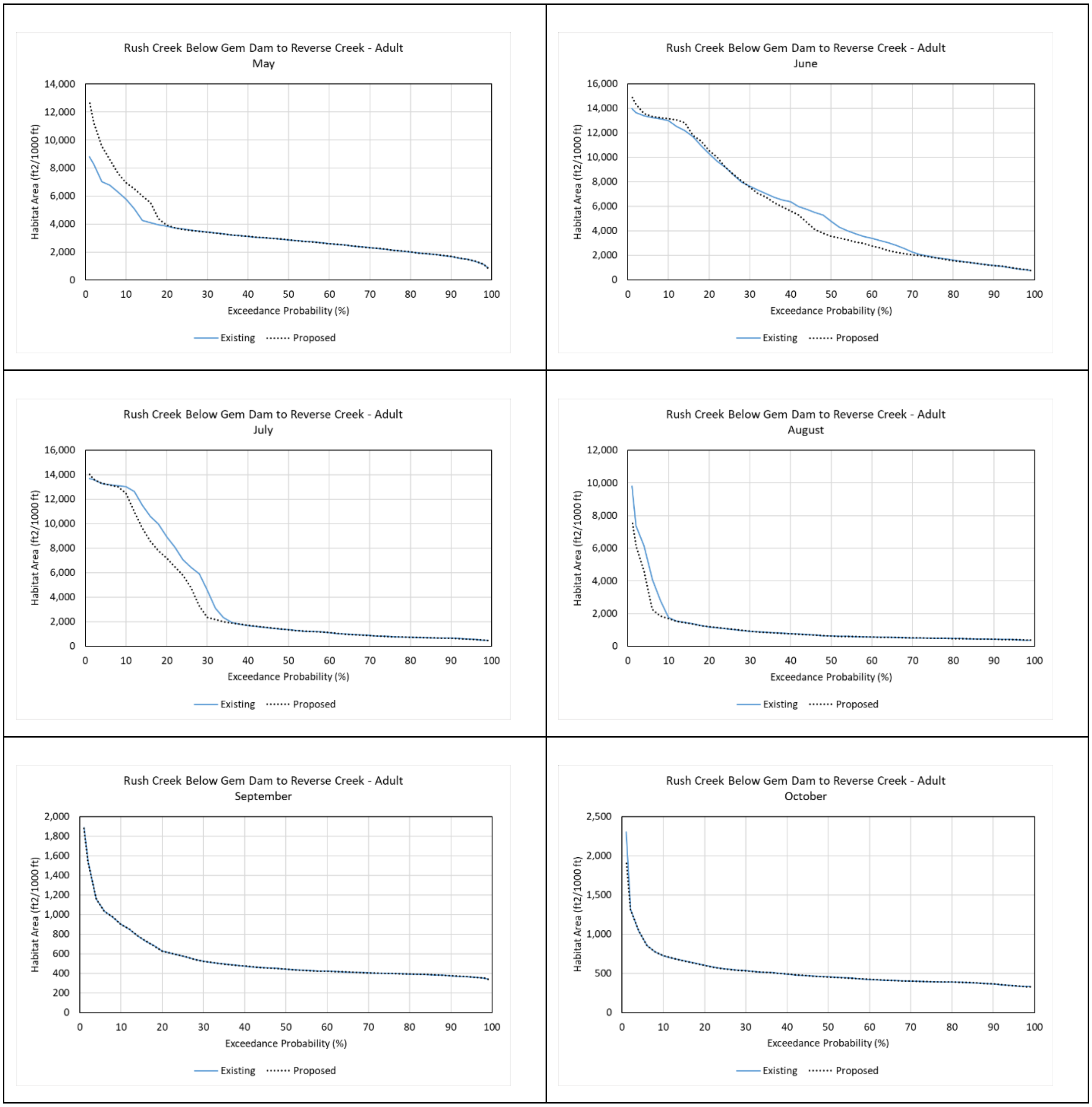



**Figure 8.4-11a. Adult Trout Daily Habitat Time Series (1990–2021) Exceedance Plots for Rush Creek below Gem Dam (Existing Condition and Proposed Project hydrology)**

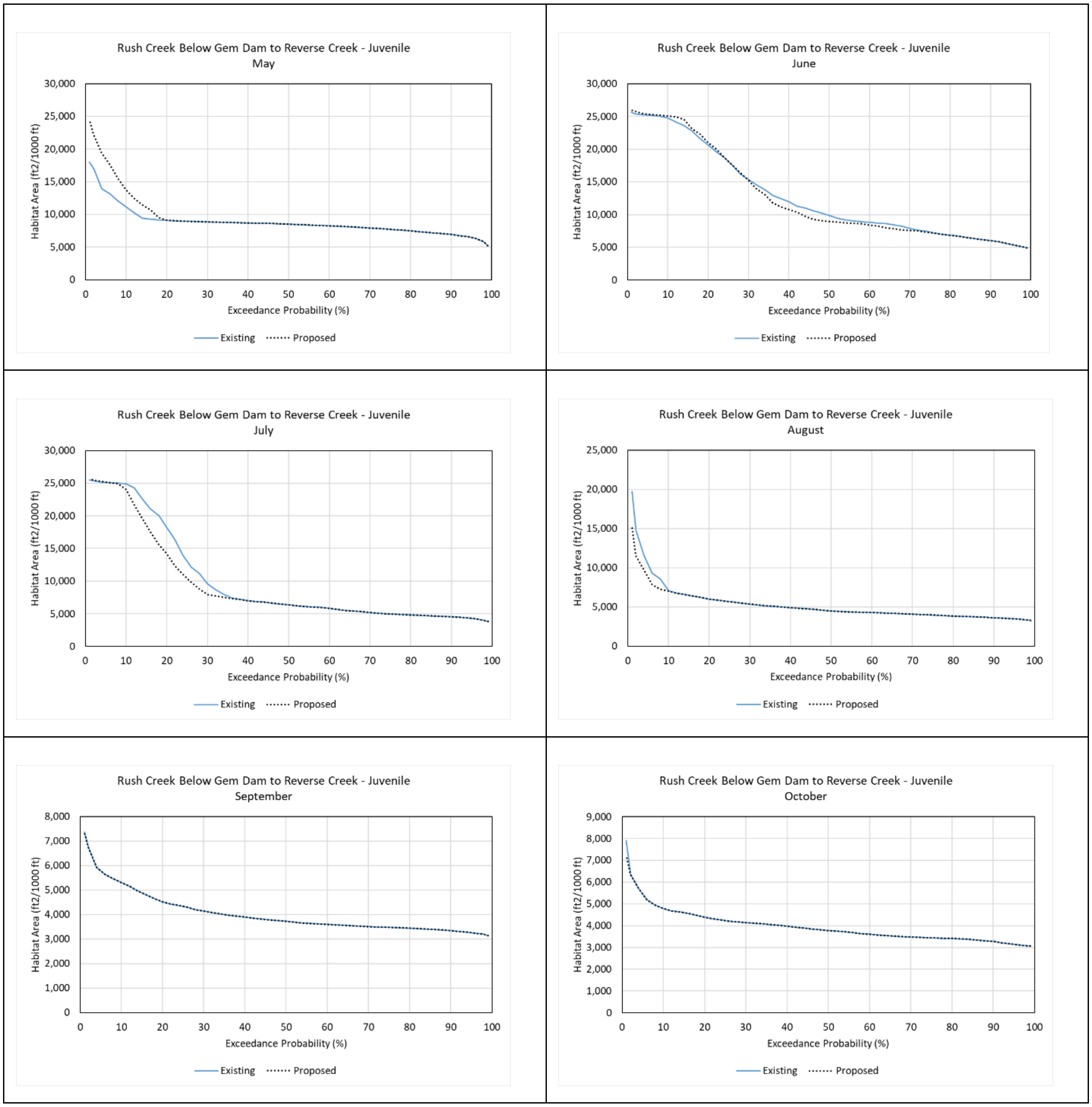



**Figure 8.4-11b. Juvenile Trout Daily Habitat Time Series (1990–2021) Exceedance Plots for Rush Creek below Gem Dam (Existing Condition and Proposed Project Hydrology)**

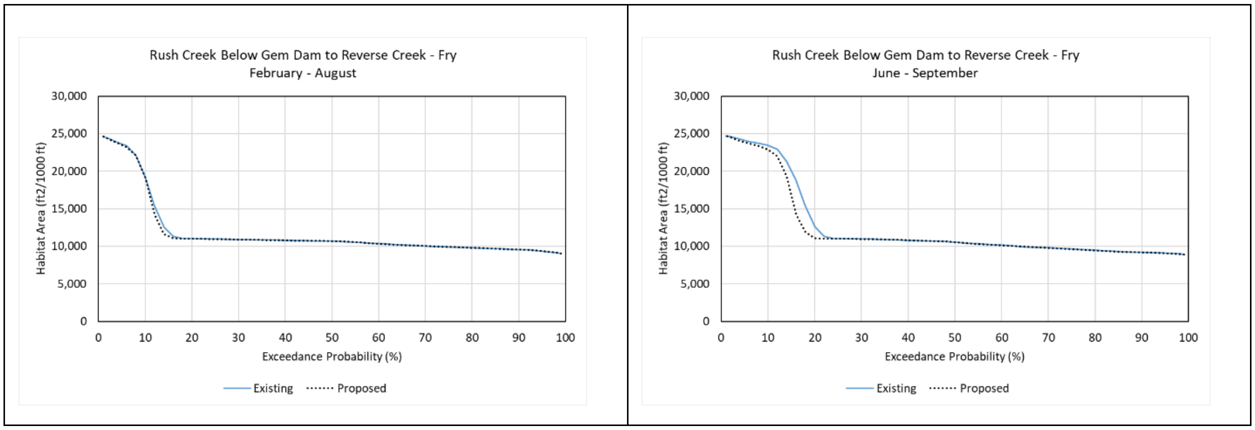



**Figure 8.4-11c. Fry Trout Daily Habitat Time Series (1990–2021) Exceedance Plots for Rush Creek below Gem Dam (Existing Condition and Proposed Project Hydrology)**

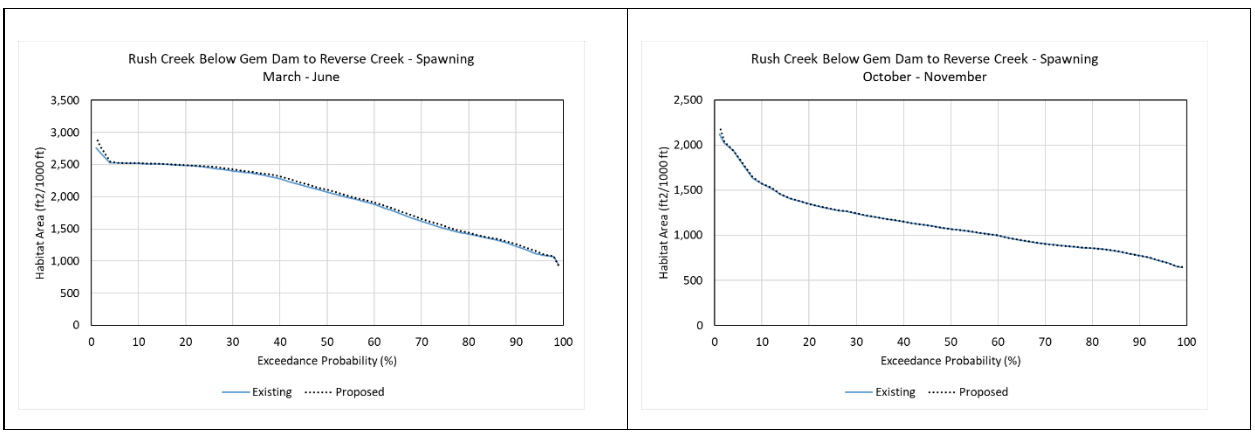



**Figure 8.4-11d. Spawning Trout Daily Habitat Time Series (1990–2021) Exceedance Plots for Rush Creek below Gem Dam (Existing Condition and Proposed Project hydrology)**

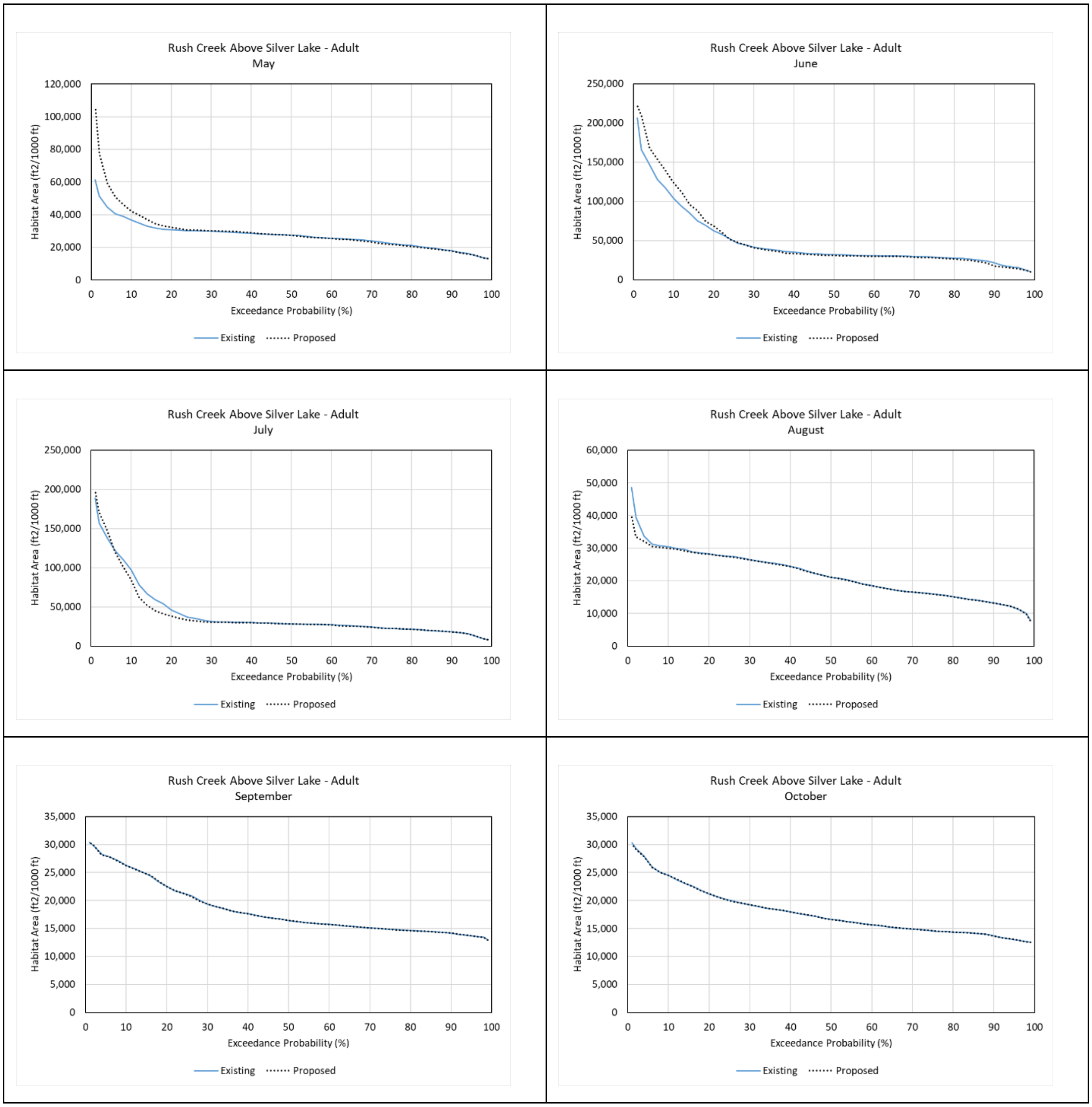



**Figure 8.4-12a. Adult Trout Daily Habitat Time Series (1990–2021) Exceedance Plots for Rush Creek above Silver Lake (Existing Condition and Proposed Project Hydrology)**

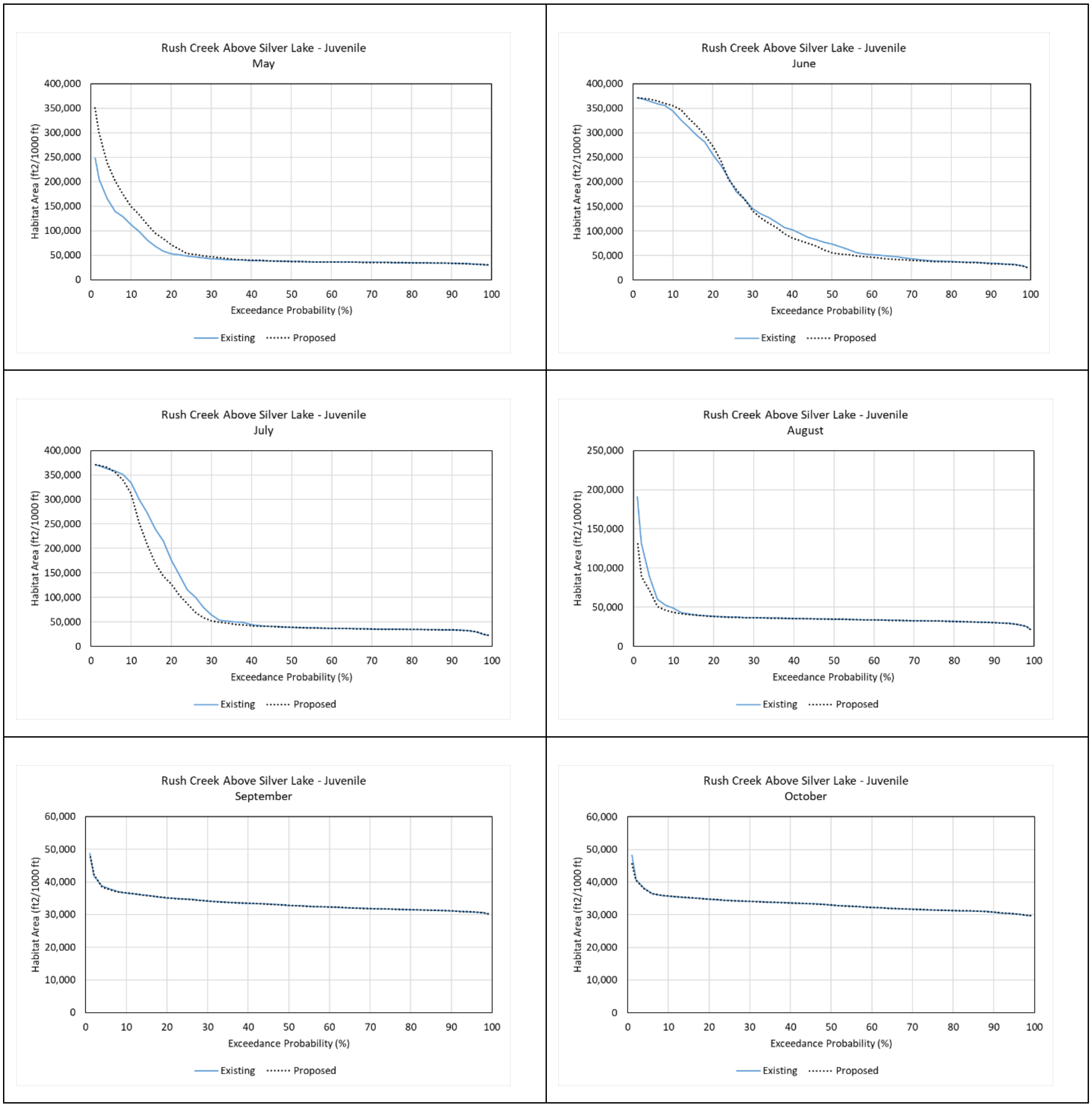
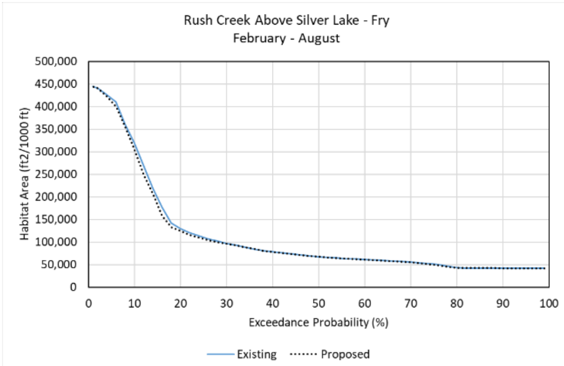



**Figure 8.4-12b. Juvenile Trout Daily Habitat Time Series (1990–2021) Exceedance Plots for Rush Creek above Silver Lake (Existing Condition and Proposed Project Hydrology)**



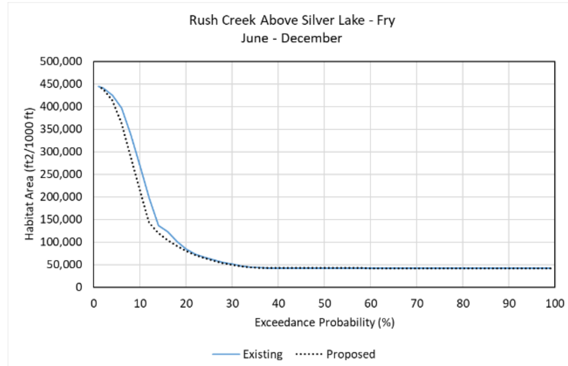




**Figure 8.4-12c. Fry Trout Daily Habitat Time Series (1990–2021) Exceedance Plots for Rush Creek above Silver Lake (Existing Condition and Proposed Project Hydrology)**

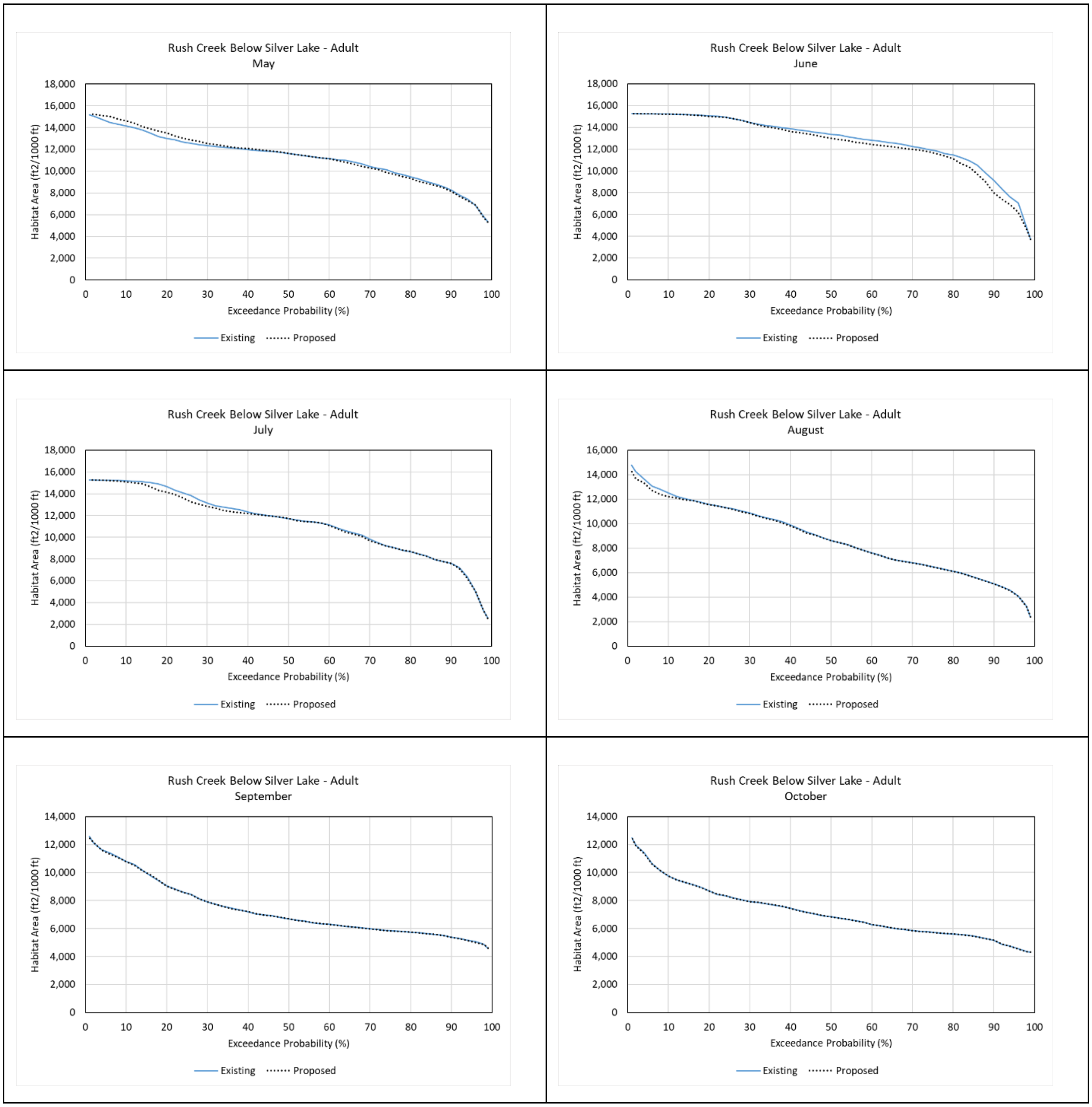



**Figure 8.4-13a. Adult Trout Daily Habitat Time Series (1990–2021) Exceedance Plots for Rush Creek below Silver Lake (Existing Condition and Proposed Project Hydrology)**

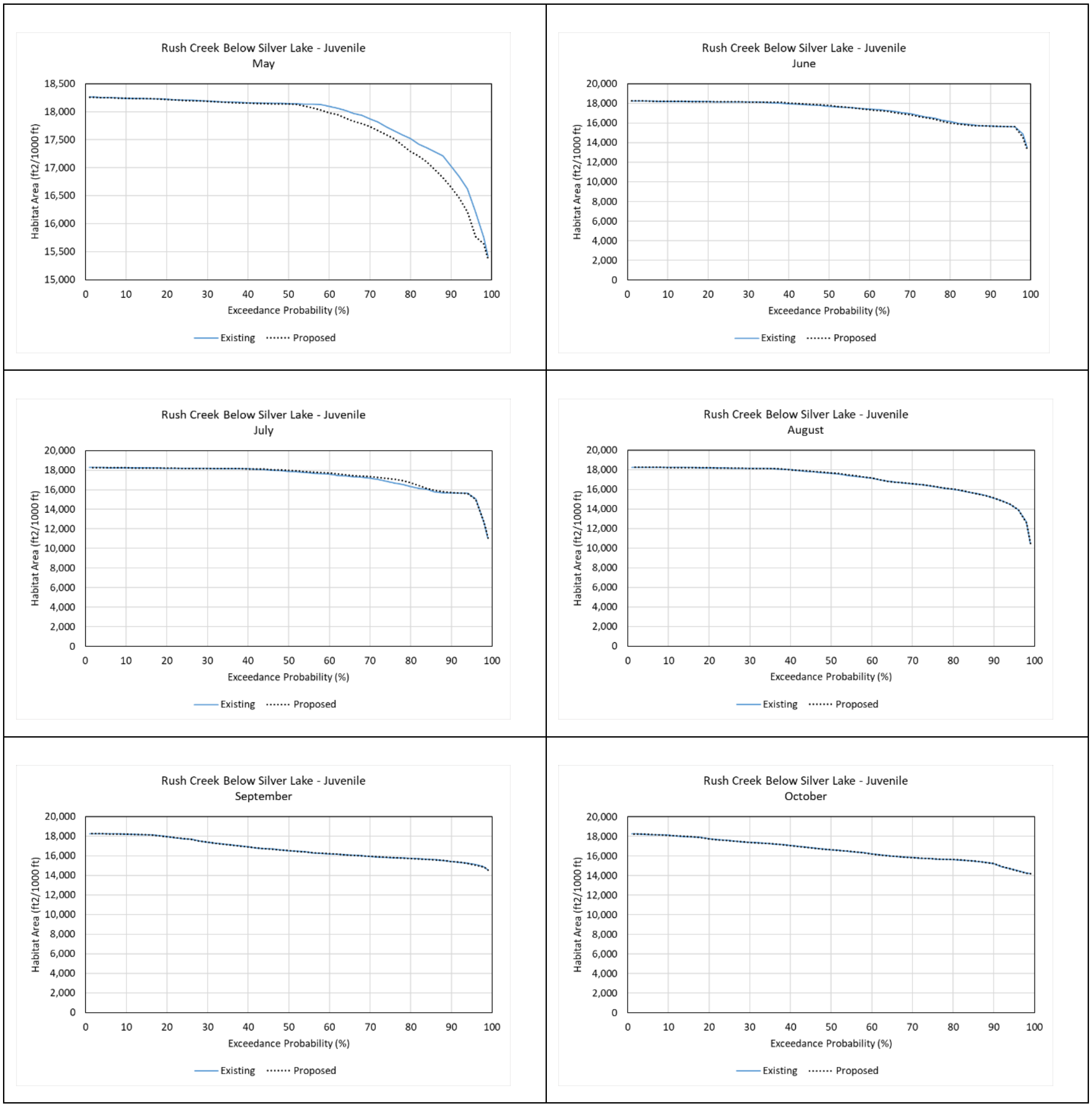



**Figure 8.4-13b. Juvenile Trout Daily Habitat Time Series (1990–2021) Exceedance Plots for Rush Creek below Silver Lake (Existing Condition and Proposed Project Hydrology)**

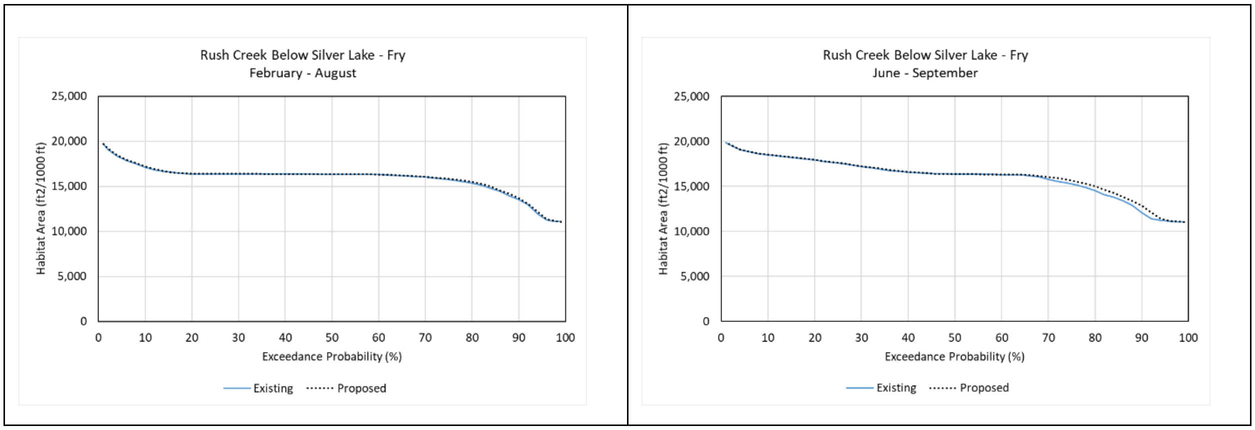



**Figure 8.4-13c. Fry Trout Daily Habitat Time Series (1990–2021) Exceedance Plots for Rush Creek below Silver Lake (Existing Condition and Proposed Project hydrology)**

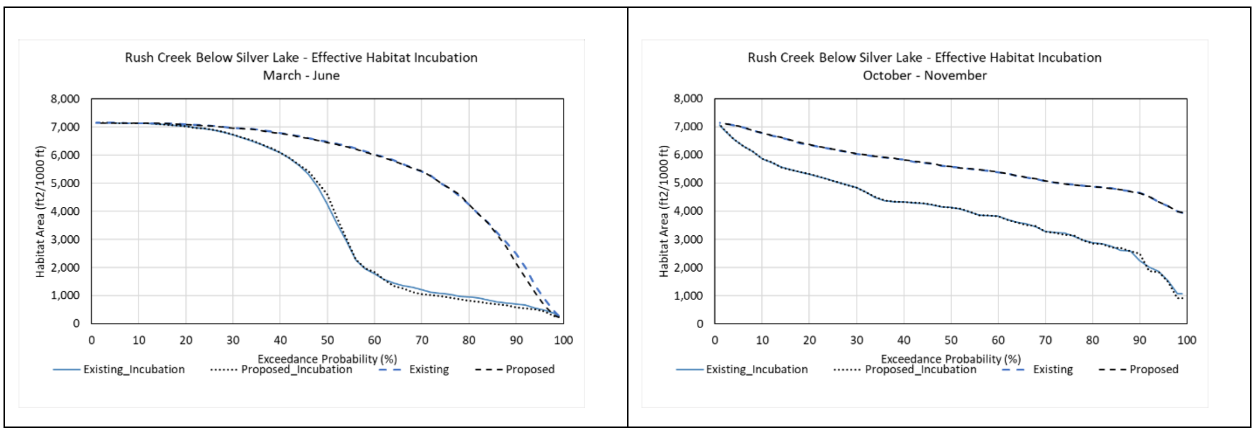



**Figure 8.4-13d. Spawning Trout Daily Habitat Time Series (1990–2021) Exceedance Plots for Rush Creek below Silver Lake (Existing Condition and Proposed Project Hydrology)**

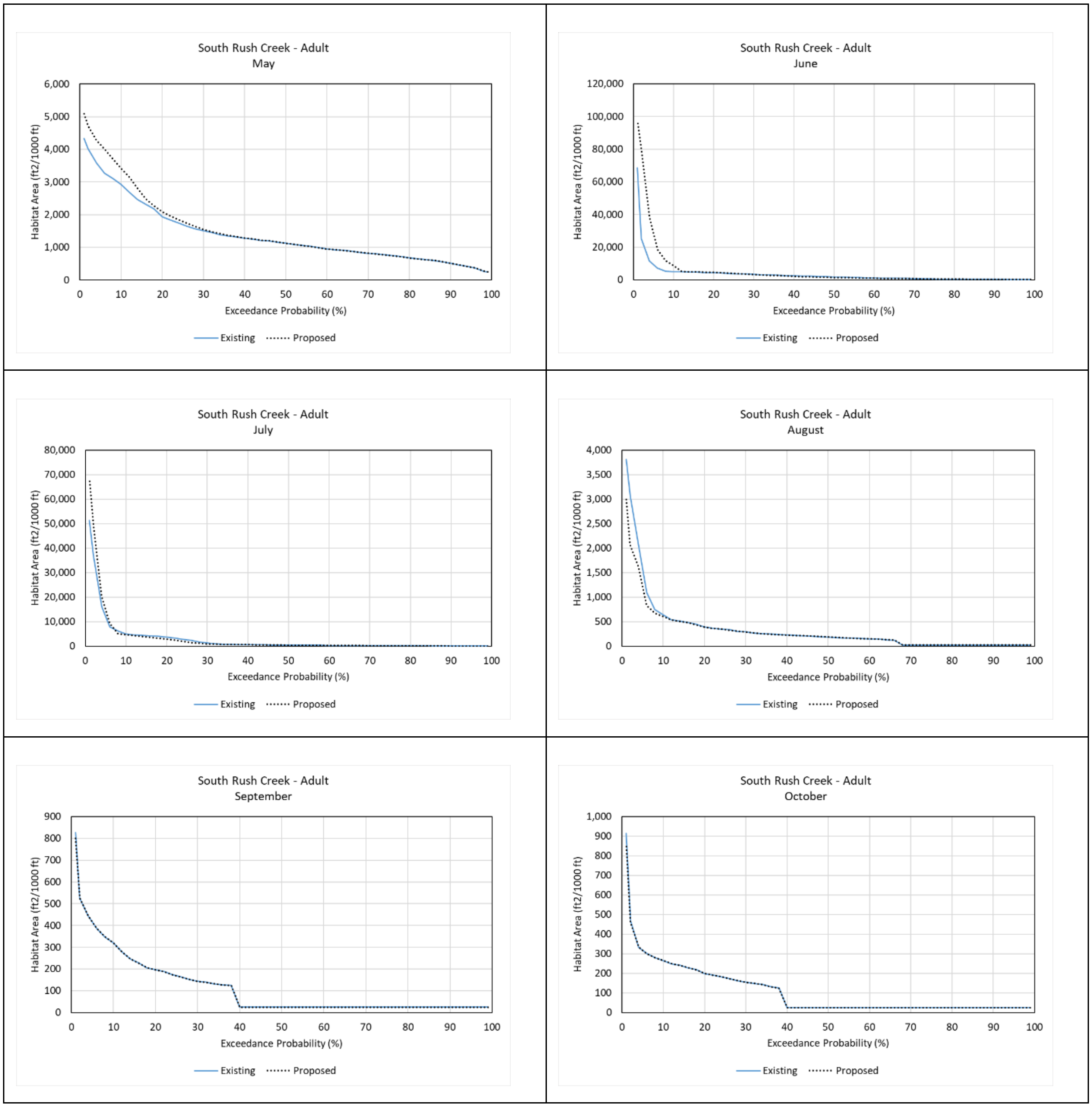



**Figure 8.4-14a. Adult Trout Daily Habitat Time Series (1990–2021) Exceedance Plots for South Rush Creek (Existing Condition and Proposed Project Hydrology)**

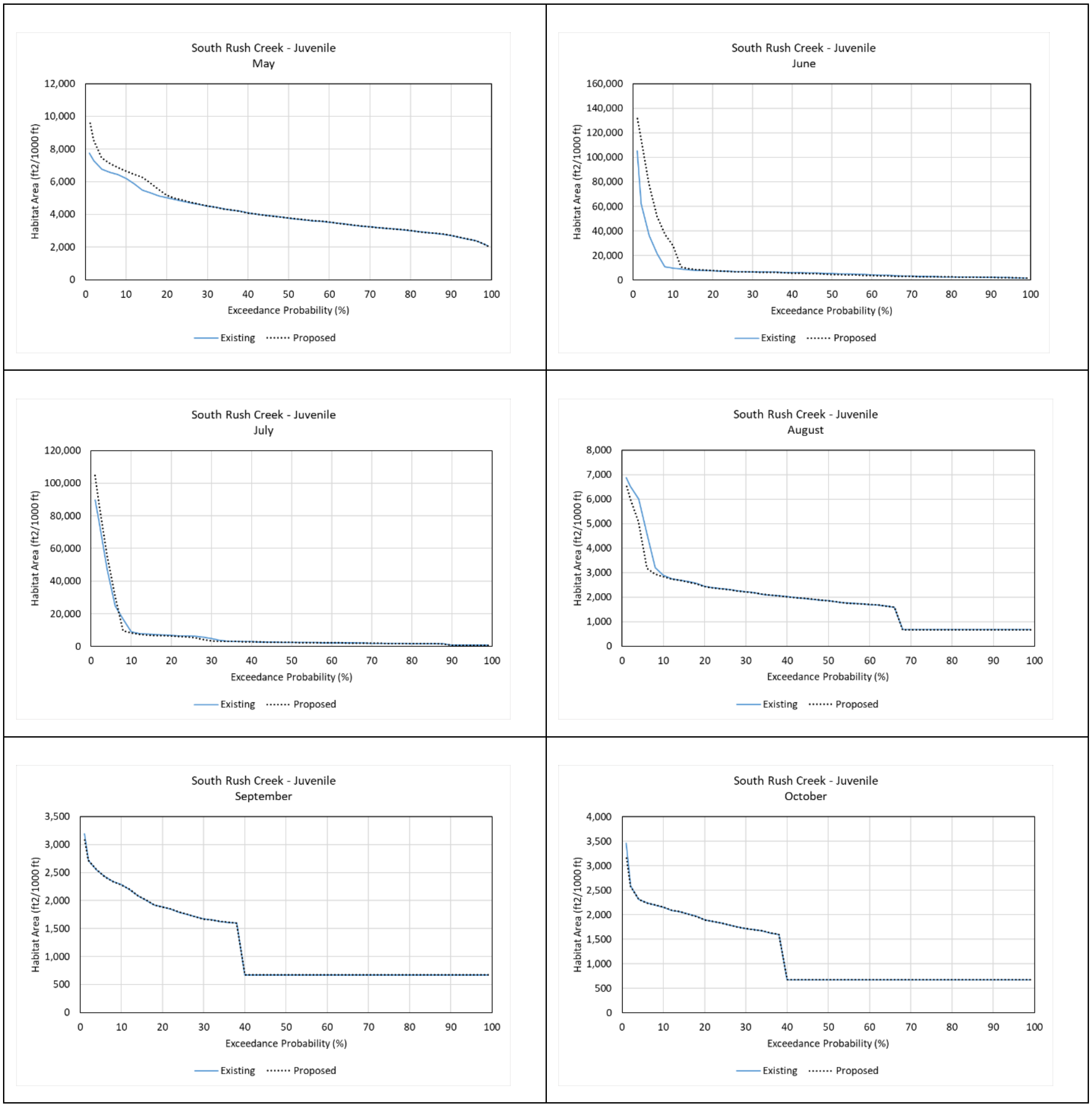



**Figure 8.4-14b. Juvenile Trout Daily Habitat Time Series (1990–2021) Exceedance Plots for South Rush Creek (Existing Condition and Proposed Project Hydrology)**

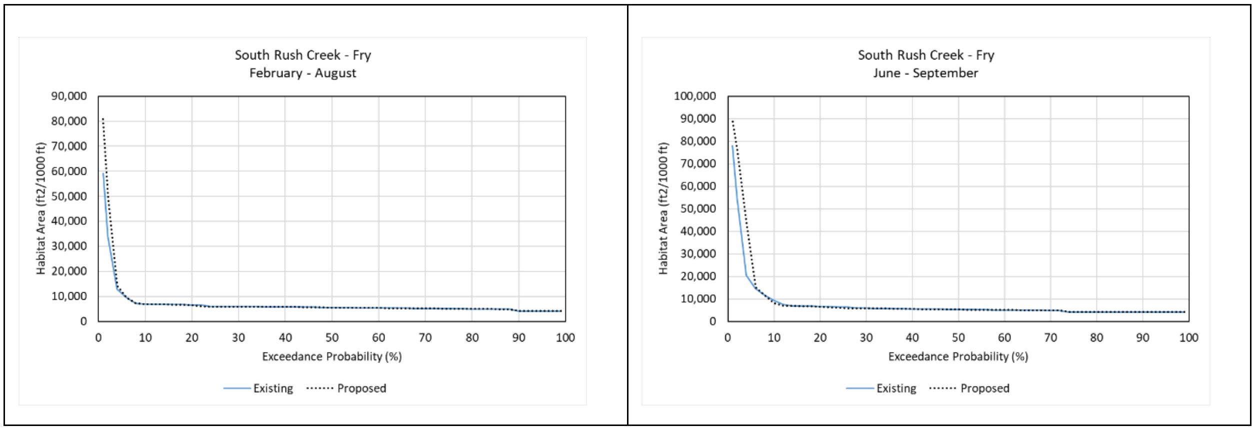



**Figure 8.4-14c. Fry Trout Daily Habitat Time Series (1990–2021) Exceedance Plots for South Rush Creek (Existing Condition and Proposed Project Hydrology)**

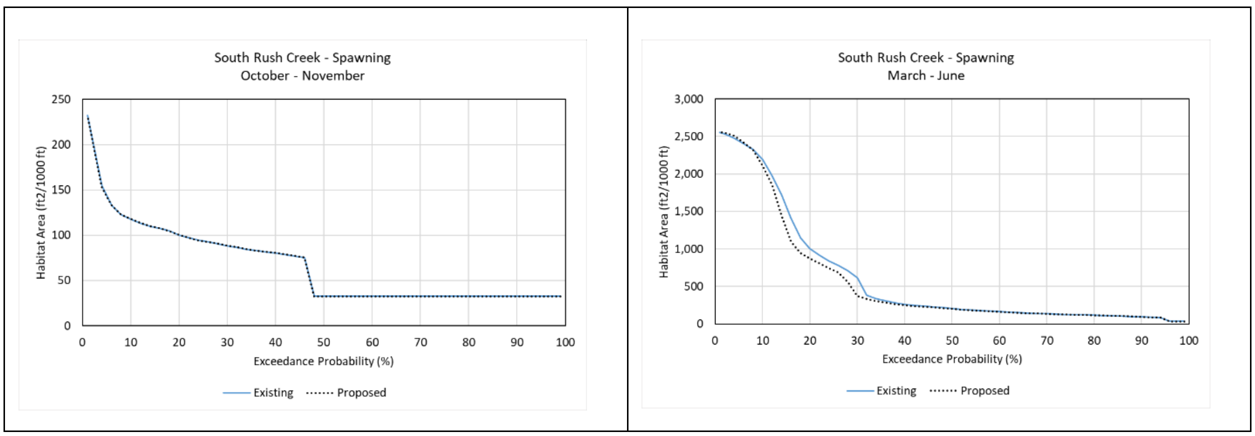



**Figure 8.4-14d. Spawning Trout Daily Habitat Time Series (1990–2021) Exceedance Plots for South Rush Creek (Existing Condition and Proposed Project Hydrology)**

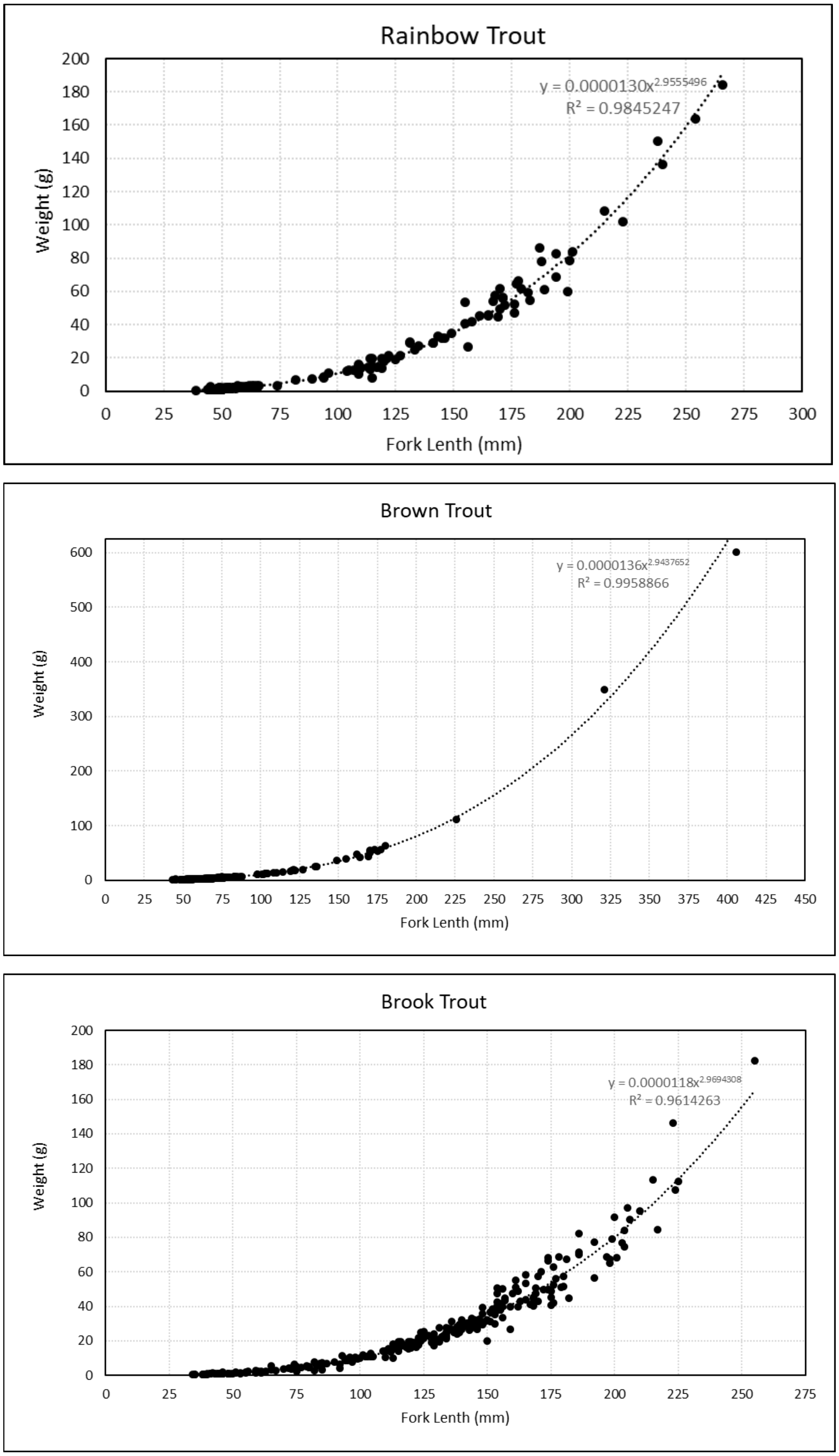
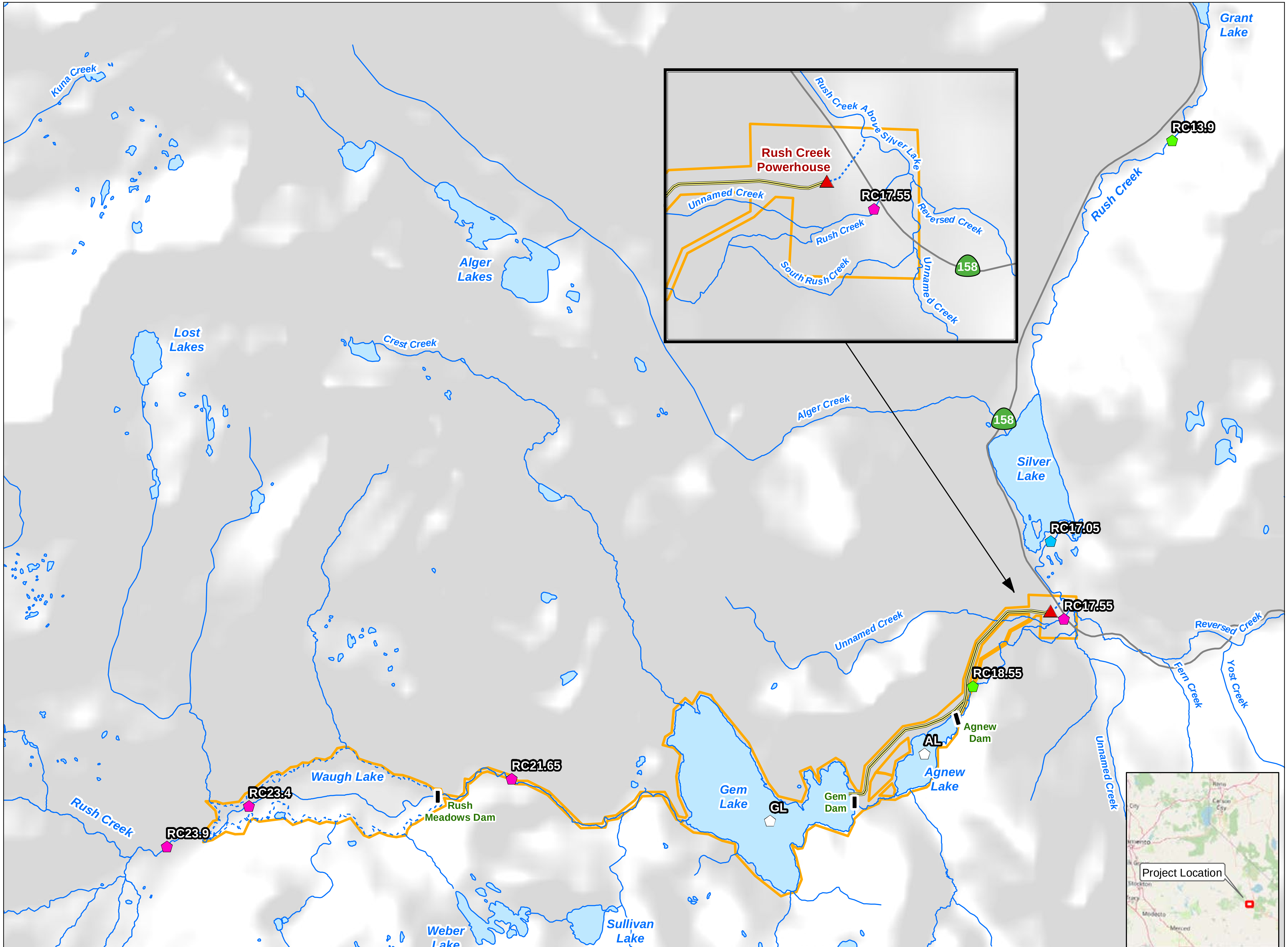



**Figure 8.4-15. Length and Weight Relationship for Each Species at All Study Sites Combined**

# MAPS




**SCE Facilities**

- Dam
- Powerhouse
- Flowline / Penstock
- Tailrace

**Other Features**

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

**Sampling Locations**

- Gill Net
- Electrofishing
- Electrofishing/Snorkeling
- Snorkeling

SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead℠

Rush Creek Project (FERC 1389)

**Map 8.4-1**

**Fish Population Sampling Locations**

N W E S

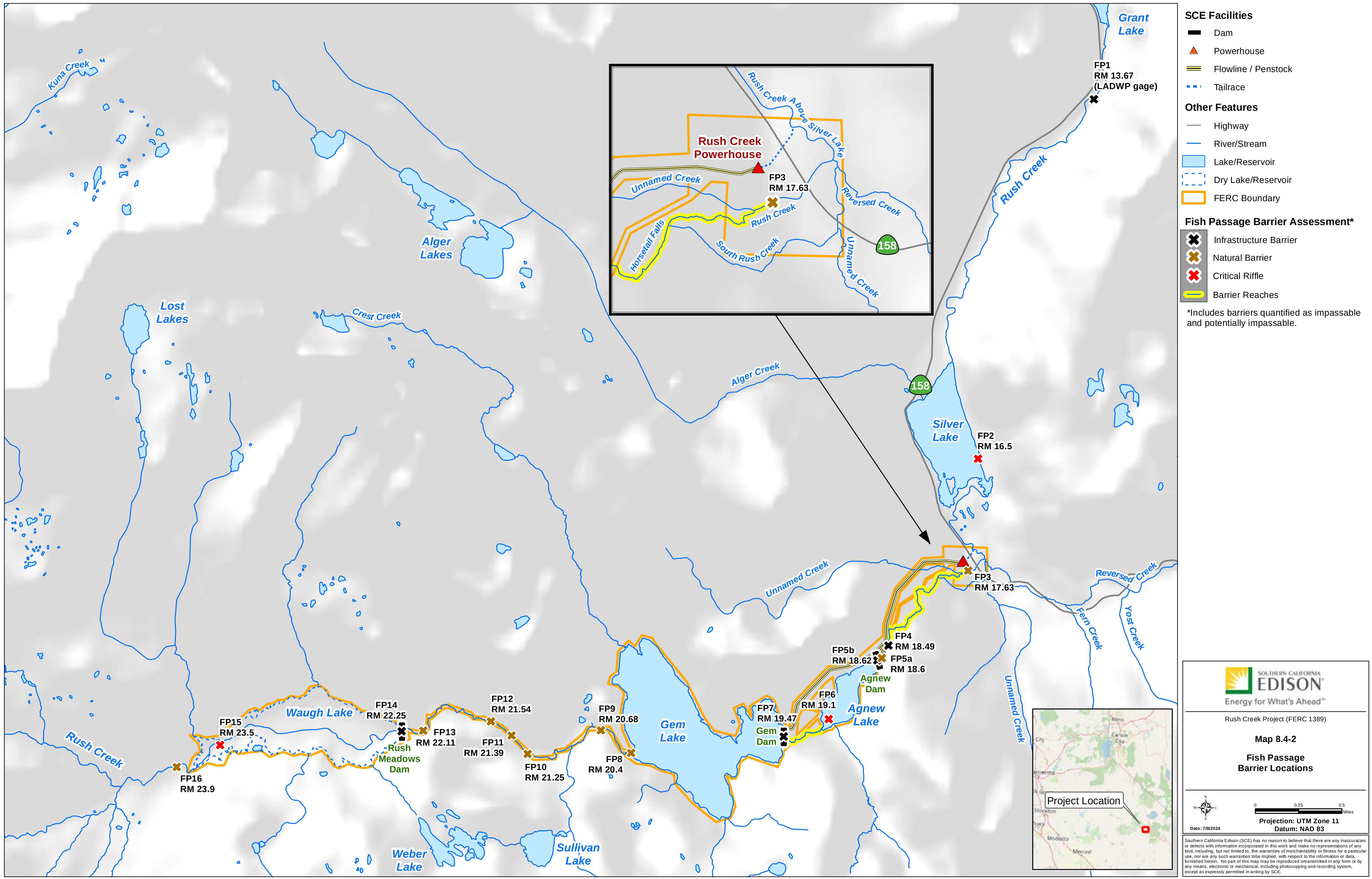
0 0.25 0.5 Miles

Date: 5/2/2024

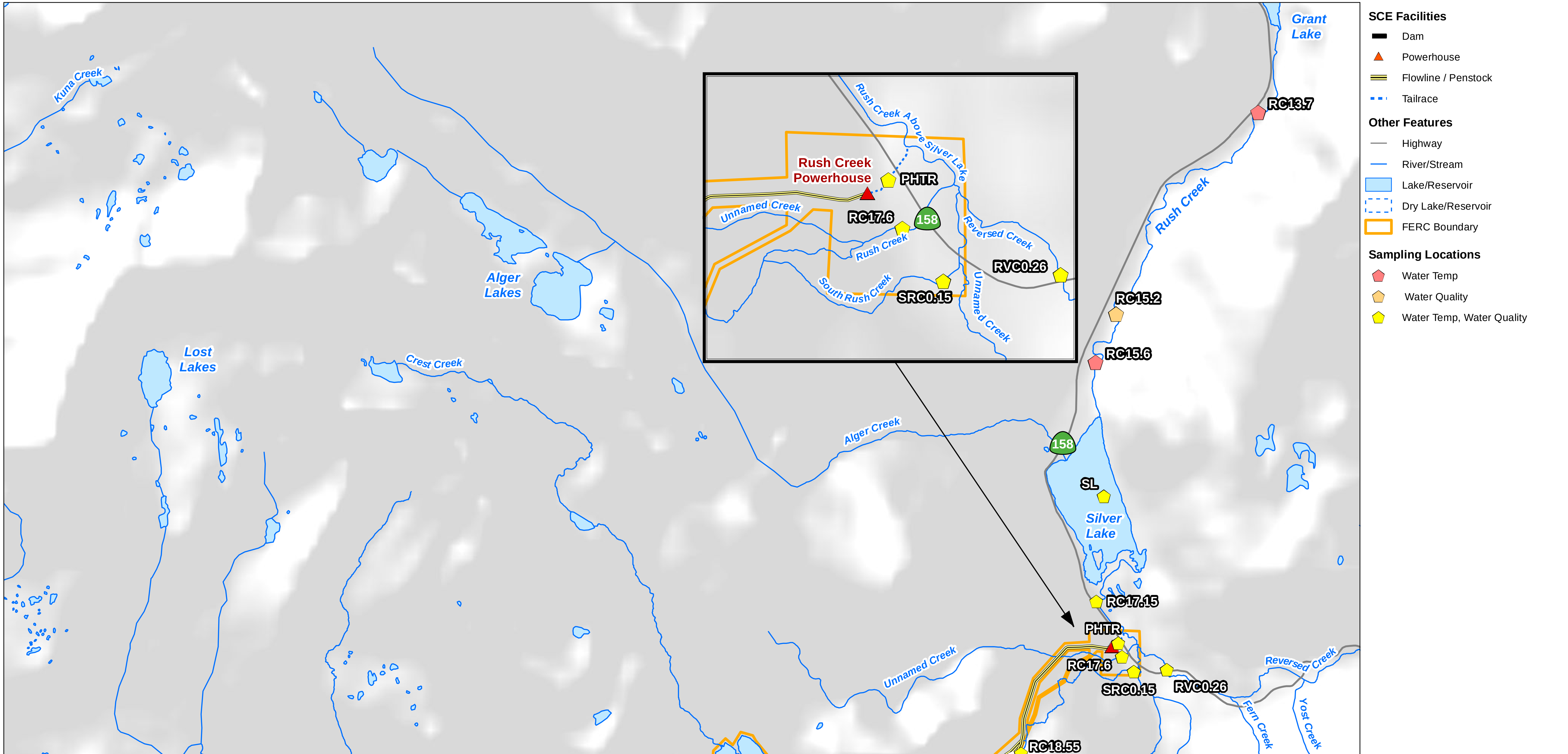
**Projection: UTM Zone 11**
**Datum: NAD 83**



C:\GIS\237800343\map\Rush Creek\AquaticMaps\SCE_RUSH_CREEK_AQ6_SamplingLocations_17i11i_03.mxd




C:\GIS\237800343\map\Rush Creek\AquaticMaps\SCE_RUSH_CREEK_AQ6_FishBarriers_17i11i_02.mxd




SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead

Rush Creek Project (FERC 1389)

**Map 8.4-3**

**Water Temperature and Water Quality Sampling Locations**

N W E S

0 0.25 0.5 Miles

Date: 5/5/2024

**Projection: UTM Zone 11**
**Datum: NAD 83**



C:\GIS\237800343\map\Rush Creek\AquaticMaps\SCE_RUSH_CREEK_AQ3_4TSP_SamplingLocations_17i11i_03.mxd

## TABLE OF CONTENTS

Page

8.5 Botanical and Wildlife Resources Affected Environment ................................ 8.5-1
8.5.1 Information Sources ........................................................................ 8.5-1
8.5.2 Botanical Resources ........................................................................ 8.5-2
8.5.2.1 Vegetation Alliances ........................................................... 8.5-2
8.5.2.2 Special-Status Plants and Mosses ...................................... 8.5-2
8.5.2.3 Non-Native Invasive Plants ................................................ 8.5-4
8.5.3 Wildlife Resources ........................................................................... 8.5-5
8.5.3.1 Wildlife Habitats ................................................................. 8.5-5
8.5.3.2 Special-Status Wildlife ....................................................... 8.5-5
8.5.3.3 Game Species .................................................................... 8.5-10
8.5.4 References ....................................................................................... 8.5-11

## LIST OF TABLES

Table 8.5-1. Vegetation Alliances and Wildlife Habitats within the FERC Project Boundary or within 1 Mile of the FERC Project Boundary ........ 8.5-14

Table 8.5-2. Special-Status Plant Species Known to Occur or Potentially Occurring within the FERC Project Boundary ........ 8.5-15

Table 8.5-3. Whitebark Pine Populations Identified within the FERC Project Boundary ........ 8.5-25

Table 8.5-4 Non-Native Invasive Plant Populations within the FERC Project Boundary ........ 8.5-27

Table 8.5-5. Special-Status Terrestrial Wildlife Species Known or Potentially Occurring within the FERC Project Boundary ........ 8.5-31

Table 8.5-6. Game Species Potentially Occurring within the FERC Project Boundary or within 1 Mile of the FERC Project Boundary ........ 8.5-39

## LIST OF MAPS

Map 8.5-1 CALVEG Vegetation Alliances within the FERC Project Boundary or within 1 Mile of the FERC Project Boundary (Index) ... 8.5-43

Map 8.5-1a CALVEG Vegetation Alliances within the FERC Project Boundary or within 1 Mile of the FERC Project Boundary ... 8.5-44

Map 8.5-1b CALVEG Vegetation Alliances within the FERC Project Boundary or within 1 Mile of the FERC Project Boundary ... 8.5-45

Map 8.5-1c CALVEG Vegetation Alliances within the FERC Project Boundary or within 1 Mile of the FERC Project Boundary ... 8.5-46

Maps 8.5-2a–i Special-Status Plants within the FERC Project Boundary (Confidential) ... 8.5-47

Map 8.5-3a Non-Native Invasive Plants within the FERC Project Boundary ... 8.5-48

Map 8.5-3b Non-Native Invasive Plants within the FERC Project Boundary ... 8.5-49

Map 8.5-3c Non-Native Invasive Plants within the FERC Project Boundary ... 8.5-50

Map 8.5-3d Non-Native Invasive Plants within the FERC Project Boundary ... 8.5-51

Map 8.5-3e Non-Native Invasive Plants within the FERC Project Boundary ... 8.5-52

Map 8.5-3f Non-Native Invasive Plants within the FERC Project Boundary ... 8.5-53

Map 8.5-3g Non-Native Invasive Plants within the FERC Project Boundary ... 8.5-54

Map 8.5-3h Non-Native Invasive Plants within the FERC Project Boundary ... 8.5-55

Map 8.5-3i Non-Native Invasive Plants within the FERC Project Boundary ... 8.5-56

Map 8.5-3j Non-Native Invasive Plants within the FERC Project Boundary ... 8.5-57

Map 8.5-3k Non-Native Invasive Plants within the FERC Project Boundary ........ 8.5-58

Map 8.5-3l Non-Native Invasive Plants within the FERC Project Boundary ........ 8.5-59

Map 8.5-3m Non-Native Invasive Plants within the FERC Project Boundary ........ 8.5-60

Map 8.5-3n Non-Native Invasive Plants within the FERC Project Boundary ........ 8.5-61

Map 8.5-3o Non-Native Invasive Plants within the FERC Project Boundary ........ 8.5-62

Map 8.5-3p Non-Native Invasive Plants within the FERC Project Boundary ........ 8.5-63

Map 8.5-3q Non-Native Invasive Plants within the FERC Project Boundary ........ 8.5-64

Map 8.5-4 Special-Status Terrestrial Wildlife Species within the FERC Project Boundary or within 1 Mile of the FERC Project Boundary (Confidential) ........ 8.5-65

Map 8.5-5 Special-Status Aquatic Amphibians within the FERC Project Boundary or within 1 Mile of the FERC Project Boundary (Confidential) ........ 8.5-66

Map 8.5-6 Location of Critical Habitat and Sierran Nevada Bighorn Sheep Herd Units within the FERC Project Boundary or within 1 Mile of the FERC Project Boundary ........ 8.5-67

Map 8.5-7 Potential SNYLF Habitat within the Study Area - Overview Map ........ 8.5-68

Map 8.5-7a Potential SNYLF Habitat within the Study Area ........ 8.5-69

Map 8.5-7b Potential SNYLF Habitat within the Study Area ........ 8.5-70

Map 8.5-7c Potential SNYLF Habitat within the Study Area ........ 8.5-71

Map 8.5-7d Potential SNYLF Habitat within the Study Area ........ 8.5-72

Map 8.5-7e Potential SNYLF Habitat within the Study Area ........ 8.5-73

Map 8.5-7f Potential SNYLF Habitat within the Study Area ........ 8.5-74

Map 8.5-7g Potential SNYLF Habitat within the Study Area ........ 8.5-75

Map 8.5-8 Potential YT Habitat within the Study Area - Overview Map ........ 8.5-76

Map 8.5-8a Potential YT Habitat within the Study Area ........ 8.5-77

Map 8.5-8b Potential YT Habitat within the Study Area ........ 8.5-78

Map 8.5-8c Potential YT Habitat within the Study Area ........ 8.5-79

Map 8.5-8d Potential YT Habitat within the Study Area ........ 8.5-80

Map 8.5-8e Potential YT Habitat within the Study Area ........ 8.5-81

Map 8.5-8f YT Known Populations and Upland Habitat (Confidential) ........ 8.5-82

Map 8.5-9 Potential Raptor Nesting Habitat within 300 Feet of Proposed Helicopter Flight Paths ........ 8.5-83

## LIST OF ACRONYMS

| | |
|---|---|
| BCC | Birds of Conservation Concern |
| CALVEG | Classification and Assessment with LANDSAT of Visible Ecological Groupings |
| CDFW | California Department of Fish and Wildlife |
| CEQA | California Environmental Quality Act |
| CESA | California Endangered Species Act |
| CFP | California Fully Protected Species |
| CNPS | California Native Plant Society |
| CRPR | California Rare Plant Ranking |
| CSC | California Species of Special Concern |
| CWHR | California Wildlife Habitat Relationships |
| Eagle Act | Bald and Golden Eagle Protection Act |
| ESA | Endangered Species Act |
| FC | federal candidate |
| FE | federally endangered |
| FEIS | Final Environmental Impact Statement |
| FERC | Federal Energy Regulatory Commission |
| Forest Service | United States Forest Service |
| FPD | federally proposed for delisting |
| FPE | federally proposed endangered |
| FPT | federally proposed threatened |
| FSCC | Inyo National Forest Species of Conservation Concern |
| FT | federally threatened |

| | |
|---|---|
| INF | Inyo National Forest |
| NNIP | non-native invasive plant |
| LANDSAT | land satellite |
| PAD | Pre-Application Document |
| PCE | Primary Constituent Element |
| Project | Rush Creek Project |
| SCE | Southern California Edison Company |
| SD A | Supporting Document A |
| SE | state endangered |
| SNYLF | Sierra Nevada yellow-legged frog |
| SR | state rare |
| ST | state threatened |
| TSR | Technical Study Report |
| USFWS | United States Fish and Wildlife Service |
| VES | visual encounter survey |
| YT | Yosemite toad |

## 8.5 BOTANICAL AND WILDLIFE RESOURCES AFFECTED ENVIRONMENT

This section describes botanical and wildlife resources in the vicinity of the Rush Creek Project (Project), including identification of vegetation alliances and wildlife habitats; federally listed rare, threatened, and endangered plant or wildlife species; other special-status plants and wildlife; non-native invasive plants (NNIP); and game species. Information on special-status fish is provided in Section 8.4 and information on riparian and littoral resources is provided in Section 8.8.

### 8.5.1 Information Sources

Information on botanical and wildlife resources in the vicinity of the Project is based on data from the following resource agency files and reports; Southern California Edison Company's (SCE) Pre-Application Document (PAD) (SCE 2021); and botanical and wildlife resource technical studies completed in 2023 for the Project relicensing. A summary of agency and stakeholder consultation is provided in Section 13, Consultation Documentation. Detailed descriptions of the study methods and results are provided in the following Technical Study Reports (TSR):

- Draft TERR 1 – Botanical Resources Technical Study Report (TERR 1 – TSR) (SCE 2024a), which is included in Supporting Document A (SD A);
- Draft TERR 2 – Wildlife Resources Technical Study Report (TERR 2 – TSR) (SCE 2024b), which is included in SD A; and
- Draft AQ 7 – Special-Status Amphibians Technical Study Report (AQ 7 – TSR), which is included in SD A (SCE 2024c)

Extensive field surveys were conducted as part of the TERR 1, TERR 2 and AQ 7 technical studies to document the full extent of botanical and wildlife resources in the vicinity of the Project. Field surveys included:

- Vegetation alliance and wildlife habitat mapping;
- Special-status plant and moss surveys;
- NNIP surveys;
- General wildlife reconnaissance surveys;
- Sierra Nevada yellow-legged frog (SNYLF) habitat surveys and visual encounter surveys (VES);
- Yosemite toad (YT) habitat surveys and VES;
- Raptor habitat and nest surveys;

- Evaluation of Project transmission line and power line pole configurations; and
- Special-status bat roost and seasonal use surveys.

### 8.5.2 Botanical Resources

This section describes botanical resources, including vegetation alliances; special-status plants and mosses; and NNIPs.

#### 8.5.2.1 Vegetation Alliances

The study area for vegetation alliances includes areas within the Federal Energy Regulatory Commission (FERC) Project boundary and within 1 mile of the FERC Project boundary. Vegetation alliances are classified based on Classification and Assessment with land satellite (LANDSAT) imagery of Visible Ecological Groupings (CALVEG) mapping and vegetation alliance descriptions developed by the United States Forest Service (Forest Service) Region 5. In addition, the California Department of Fish and Wildlife (CDFW) maintains a ranking list of Sensitive Natural Communities in the State of California. Sensitive Natural Communities with ranks S1, S2, and S3 are protected under the California Environmental Quality Act (CEQA).

Twenty-six vegetation alliances are present within the study area. Vegetation alliances in the study area vary with increases in elevation. The higher elevations of the study area (approximately 8,500 feet and higher) are composed primarily of lodgepole pine and subalpine conifer alliances, as well as and alpine grasses and forbs. The lower elevation areas are more varied and include alliances such as eastside pine, curlleaf mountain mahogany, low sagebrush, western (mountain) juniper, Great Basin mixed chapparal, snowbrush, annual grasses, and forbs. One sensitive natural community, quaking aspen (S3), is known to occur within the FERC Project boundary and extends outside the boundary (approximately 175 acres).

Refer to Table 8.5-1 for a list of vegetation alliances found within the study area, and to Maps 8.5-1a-c for the location and extent of vegetation alliances. Additional information on vegetation alliances is provided in TERR 1 – TSR (SCE 2024a). Additional information on riparian habitat is provided in Section 8.8, Riparian Resources.

#### 8.5.2.2 Special-Status Plants and Mosses

For the purposes of this document, a special-status plant is defined as any plant species that is granted protection by a federal or state agency, including:

- Federally listed plant species granted status by United States Fish and Wildlife Service (USFWS) under the Federal Endangered Species Act (ESA) include threatened (FT), endangered (FE), proposed threatened or endangered (FPT, FPE), candidate (FC), or listed species proposed for delisting (FPD).

- State of California listed plant species, which are granted status by the CDFW under the California Endangered Species Act (CESA) include state threatened (ST), endangered (SE), rare (SR), and California Species of Special Concern (CSC).
- California Native Plant Society (CNPS) maintains the California Rare Plant Ranks (CRPR), a ranking system for rare, threatened, or endangered plants in California. Under the CEQA, special-status plants include the following CRPR rankings:
  - 1A (presumed extirpated in California and either rare or extinct elsewhere);
  - 1B (rare, threatened, or endangered in California and elsewhere);
  - 2A (presumed extirpated in California but common elsewhere); and
  - 2B (rare, threatened, or endangered in California but common elsewhere).
- The Inyo National Forest (INF) also maintains lists of plant species of special concern (FSCC) (Forest Service 2019a) that were designated by the INF Forest Supervisor as part of the development of the INF's Revised Land Management Plan and Final Environmental Impact Statement (FEIS) (Forest Service 2019b).

The study area for special-status plants includes lands within the FERC Project boundary.[1] Based on information from the PAD; supplemental literature review; and input from INF botanists for the TERR 1 – TSR, 80 special-status plant and moss species were determined to have the potential to occur in the study area. Refer to Table 8.5-2 for the status of each species, life history requirements, and information on their presence in the study area.

Two special-status species are known to occur in the study area.

- **Alpine bentgrass** (*Agrostis humilis* [FSCC]) has been observed at low cover intermittently on two long-term riparian monitoring sites along Rush Creek Below Rush Meadows Dam since long-term monitoring was initiated in 1999 (E. Read and Associate, Inc. 2023), but the species was not detected in every year that the monitoring was conducted (it was not detected during 2009 or 2018 monitoring visits). Alpine bentgrass was observed in 2022; but was not observed during the special-status plant surveys in 2023. Refer to Map 8.5-2 for the location of this population.

[1] SSPs along the Project-affected stream segments were only documented at riparian sampling sites.

- **Whitebark pine** (*Pinus albicaulis* [FT]) was observed during the TERR 1 botanical surveys. Thirty-eight populations of whitebark pine and eleven populations of unknown five-needle pines[2] occupying approximately 58 acres were mapped within the study area. All populations were located at 8,500 feet in elevation or higher and primarily on north-facing slopes. Table 8.5-3 provides the unique population ID, total number of individuals, size in square feet and acres, and vegetation alliance for each population. Refer to Map 8.5-2 for the location of each population.

### 8.5.2.3 Non-Native Invasive Plants

The study area for NNIPs includes lands within the FERC Project boundary.[1] A list of target NNIP species was developed in consultation with INF botanists for the TERR 1 – TSR (Forest Service 2023). Based on preliminary information, one NNIP species, cheatgrass (*Bromus tectorum*), was previously identified in the study area. Thirty-seven additional NNIP species were identified as potentially occurring in the study area. These 38 species were determined to be the target species for the TERR 1 NNIP surveys. Thirteen of the target NNIP species were observed in the study area, including:

- Forty-three populations of cheatgrass;
- Sixteen populations of common mullein (Verbascum thapsus);
- Nine populations of curly dock (*Rumex crispus*);
- Seven populations of common dandelion (*Taraxacum officinale*);
- Seven populations of yellow salsify (*Tragopogon dubius*);
- Six populations of white sweetclover (*Melilotus albus*);
- Five populations of bull thistle (*Cirsium vulgare*);
- Four populations of white clover (*Trifolium repens*);
- Two populations of prostrate knotweed (*Polygonum aviculare*);
- Two populations of red sandspurry (*Spergularia rubra*);
- One population of spotted knapweed (*Centaurea stoebe*);

[2] Five-needle pine trees missing conclusive features for identification (i.e., mature bark and cones) were classified as “unknown five-needle pines” consistent with INF guidance.

- One population of Russian thistle (tumbleweed) (*Salsola tragus*); and
- One population of soapwort (*Saponaria officinalis*).

In general, NNIP populations were most abundant in the vicinity of the Rush Creek Powerhouse, with all the species listed above found in this area. Three NNIP species totaling 4.16 acres (common mullein, curly dock, and cheatgrass) were found in the vicinity of Agnew Dam. Only one species of NNIP, cheatgrass, was found in the vicinity of Rush Meadows Dam (totaling less than 0.01 acre) and Gem Dam (totaling 0.02 acre).

Refer to Table 8.5-4 for a summary of each NNIP population and to Map 8.5-3 for the location of each population in the study area.

### 8.5.3 Wildlife Resources

This section describes wildlife resources within the vicinity of the Project, including wildlife habitats and common wildlife species; special-status wildlife; and game species.

#### 8.5.3.1 Wildlife Habitats

The study area for wildlife habitats includes areas within the FERC Project boundary and within 1 mile of the FERC Project boundary. Information on wildlife habitats was obtained to characterize habitat conditions and identify the potential for common and special-status wildlife species in the study area. Vegetation alliances described in Section 8.5.2.1 were cross-walked with the California Wildlife Habitat Relationships (CWHR) habitats using a CALVEG–CWHR Crosswalk for California (Forest Service 2009). This crosswalk was developed by Forest Service and CDFW as a method to determine which wildlife habitats are likely to be present based on existing vegetation alliances and forest structural characteristics.

Seventeen wildlife habitats were identified in the study area. Refer to Table 8.5-1 for a list of the wildlife habitats that occur within 1 mile of the FERC Project boundary. Detailed descriptions of wildlife habitats are provided in the TERR 2 – TSR (SCE 2024b). Additional information on the location of riparian habitat is described in Section 8.8, Riparian Resources.

#### 8.5.3.2 Special-Status Wildlife

This section describes special-status wildlife that occur or may potentially occur in the study area. Refer to Section 8.4, Fish and Aquatic Resources for more information on fish in the study area. For the purposes of this document, a special-status wildlife species is defined as any animal species that is granted status by a federal, state, or local agency, including:

- Federally listed species granted status by USFWS under the ESA including FT, FE, FPT, FPE, FC, or FPD. Bald and golden eagles are protected under the Federal Bald and Golden Eagle Protection Act (Eagle Act). Also included as special-status species are those species listed by USFWS as Birds of Conservation Concern (BCC) which include “migratory and non-migratory bird species (beyond those already designated as federally threatened or endangered) that represent our highest conservation priorities" (USFWS 2021).

- State of California listed terrestrial wildlife species which are granted status by the CDFW under the CESA including ST, SE, Fully Protected species (CFP), and CSC.
- INF Species of Conservation Concern list (Forest Service 2019a).

The study area for documentation of most special-status wildlife includes lands within the FERC Project boundary. Additional species-specific study areas are defined in the applicable sections below.

Nine special-status species were observed in the study area during technical studies conducted as part of the TERR 2 and AQ 7 technical studies or observed incidentally during other studies. Twenty-four additional special-status wildlife species may potentially occur in the study area based on a literature and data review. Refer to Table 8.5-5 for a comprehensive list of special-status wildlife species evaluated for their potential to occur in the study area, including the status of each species, a summary of life history requirements, and information on their presence in the study area. Refer to Map 8.5-4 for the location of terrestrial special-status species and to Map 8.5-5 for the location of special-status aquatic amphibians known to occur within 1 mile of the FERC Project boundary. Detailed information is provided in the TERR 2 – TSR (SCE 2024b) and the AQ 7 – TSR (SCE 2024c).

**<u>Special-Status Invertebrates</u>**

One special-status butterfly, the monarch (*Danaus Plexippus* [FC]) was observed in the vicinity of Waugh Lake and Gem Lake during technical studies. The monarch host plant (milkweed, *Asclepias* ssp.) was not observed, so the study area does not contain suitable breeding habitat for this species. Three additional special-status butterflies may potentially occur in the study area in appropriate habitat. Refer to Table 8.5-5 for a summary of each species' status, habitat requirements, and potential for occurrence in the study area.

**<u>Special-Status Amphibians</u>**

Two special-status amphibians—SNYLF (*Rana sierrae* [FE, ST]) and YT (*Anaxyrus canorus* [FT, CSC])—may potentially occur in the vicinity of the Project. A summary of the results of the habitat evaluation and VES conducted for these two amphibians is provided below.

*SIERRA NEVADA YELLOW-LEGGED FROG*

The study area for documentation of SNYLF habitat includes areas within, and/or immediately adjacent to, Project-affected stream segments and Project reservoirs. The study area for SNYLF VES includes select stream reaches (i.e., sampling locations),[3] and meadows and meadow systems adjacent to Project-affected stream segments and Project reservoirs.

Portions of the study area are located within USFWS-designated Critical Habitat for SNYLF (Subunit 3E, Evolution/Leonte). Refer to Map 8.5-6 for a depiction of the study area in relation to Critical Habitat (USFWS 2016).

As part of the AQ 7 technical studies, SCE assessed potentially suitable aquatic habitats in the study area to document the presence of Primary Constituent Elements (PCE). For the purposes of the AQ 7 study, a habitat was considered suitable aquatic breeding habitat if the following PCEs were present:

- The aquatic habitat was of sufficient depth (i.e., greater than 5.6 feet deep) to not freeze solid during the winter;
- The aquatic habitat maintains water during the entire tadpole growth phase (i.e., for a minimum of 2 years); and
- The aquatic habitat is free of introduced predators. The determination of whether introduced predators are present was based on observations of fish during the habitat evaluation and/or VES, as well as a review of the results of the AQ 6 – Fish Populations TSR for Project-affected steam segments and lakes.

Only one isolated pond, identified as Pond 1, at the southwest corner of Waugh Lake contains potential breeding habitat for SNYLF. It is the only habitat in the study area that contains all three of the critical aquatic breeding features and therefore meets the designated criteria for aquatic breeding habitat. Other areas surveyed met the criteria for non-breeding PCEs, upland habitat, or possible dispersal habitat. Refer to Map 8.5-7 for the location of breeding, non-breeding, upland habitat, and dispersal habitat for SNYLF within the study area.

No SNYLF of any life stage were identified during VES conducted in the study area. SNYLF were incidentally observed during REC 1 recreation surveys within a meadow complex approximately 1 mile west of Waugh Lake near the Pacific Crest Trail (refer to Map 8.5-5). SNYLF of all life stages were observed at this location, which overlaps with a previously known occurrence of SNYLF. This is the closest known occupied habitat to the study area.

3 Reaches are shorter sections of streams within a longer segment (length of stream with homogeneous flow) that are delineated due to differences in fluvial geomorphology (e.g., stream gradient, channel confinement).

Additional information on the results of the SNYLF habitat assessment and VES is provided in the AQ 7 – TSR (SCE 2024c).

*YOSEMITE TOAD*

The study area for documentation of YT habitat includes meadows and meadow systems adjacent to Project-affected stream segments and Project reservoirs. The study area for YT VES includes meadows and meadow-like systems (i.e., ponds, shallow lakes, ephemeral pools, etc.) adjacent to Project-affected stream segments and Project reservoirs that contain suitable habitat (PCEs). The study area overlaps USFWS designated Critical Habitat for Yosemite toad (Unit 5, Tuolumne Meadows/Cathedral) (USFWS 2016). Refer to Map 8.5-6 for a depiction of the study area in relation to Critical Habitat.

As part of the AQ 7 technical studies, SCE assessed potentially suitable aquatic habitats in the study area to document the presence of PCEs for YT. For the purposes of the AQ 7 study, a habitat was considered suitable aquatic breeding habitat only if the aquatic habitat held water for a minimum of 5 weeks, but more typically 7 to 8 weeks. A buffer of 0.78 mile from suitable aquatic breeding habitat was to delineate potential upland habitat for YT.

Seven habitats were determined to support breeding PCEs for YT. Other areas surveyed met the criteria for non-breeding PCEs, upland habitat, or possible dispersal habitat. The nearest known occurrence/breeding population of YT is in a pond approximately 0.7 mile south of Waugh Lake. Therefore, the southern shoreline of Waugh Lake falls within the upland dispersal distance of known occupied YT habitat. The remainder of Project-affected stream segments and lakes are outside the upland dispersal distance of known occupied YT habitat. Refer to Map 8.5-8 for the location of breeding, upland habitat, and dispersal habitat for YT within the study area.

No YT individuals of any life stage were observed in the study area during VES surveys, and YTs were not observed incidentally during other technical studies conducted in 2023.

Additional information on the results of the YT habitat assessment and VES is provided in the AQ 7 – TSR (SCE 2024c).

## Special-Status Bird Species

*RAPTORS*

Two special-status raptor species, golden eagle (*Aquila chrysaetos* [Eagle Act, CFP]) and bald eagle (*Haliaeetus leucocephalus* [Eagle Act, FSS, SE, CFP]) are known to occur in the study area. Observations of golden eagles foraging in the vicinity of Silver Lake were reported by agencies and other participants in the TERR 2 technical working groups; and there are known nests of the species within 4 miles of the study area. Numerous bald eagles (including adults and subadults) were observed flying or perching in the vicinity of Silver Lake, Gem Lake, and Waugh Lake during implementation of technical studies.

An additional five raptor species may potentially occur in suitable habitat in the study area. Refer to Table 8.5-5 for a summary of each species' status, habitat requirements, and potential for occurrence in the study area.

Surveys were conducted to assess potential habitat for cliff-nesting and tree-nesting raptors located within 300 feet of the proposed helicopter flight path from the Base of Operations at the June Mountain Ski Area to construction areas at Agnew, Gem, and Waugh lakes. Refer to Map 8.5-9 for the location of habitat for cliff-nesting and tree-nesting raptors. Surveys to determine the location of active raptor nests in the vicinity of the proposed helicopter flight path will be implemented in 2024.

*OTHER BIRDS*

Three non-raptorial special-status birds were observed in the study area:

- Calliope hummingbird (*Selasphorus calliope* [BCC]), observed in willow habitats along Rush Creek above Silver Lake;
- Yellow warbler (*Setophaga petechia* [SSC]), observed in the vicinity of Silver Lake; and
- Cassin's finch (*Haemorhous cassinii* [BCC]), observed in the vicinity of Rush Creek, Rush Creek Power House, and Frontier Pack Station.

Four additional non-raptorial birds may potentially occur in suitable habitat. Refer to Table 8.5-5 for a summary of each species' status and habitat requirements, and potential for occurrence in the study area.

**<u>Special-Status Mammals</u>**

*BATS*

Three special-status bat species may potentially occur in the study area. Refer to Table 8.5-5 for a summary of each species' status and habitat requirements, and potential for occurrence in the study area.

Project facilities that may potentially support bat roosts include dams, ancillary and support facilities, hoist and valve houses, some reservoir and stream gages, and the Rush Creek Powerhouse. Refer to the TERR 1 – TSR (SCE 2024a) for additional information on facilities potentially supporting bat roosts.

No common bat species or special-status bats, roosts, or bat sign were detected at any of the Project facilities inspected in 2023. Bat roost surveys and seasonal use surveys were delayed until 2024 due to heavy snow conditions.

*OTHER MAMMALS*

Ten additional special-status mammals may potentially occur in suitable habitat within the study area. Refer to Table 8.5-5 for a summary of each species' status and habitat requirements, and potential for occurrence in the study area.

USFWS-designated Critical Habitat for the Sierra Nevada bighorn sheep (Unit 2, Mount Gibbs) is located approximately 1.2 miles east of the study area (refer to Map 8.5-6). There are no known occurrences of this species in the FERC Project boundary or within 1 mile of the boundary. Collared individuals of the Mt. Gibbs herd commonly spend most of the year in alpine habitats and make seasonal movements between Mt. Gibbs and Mt. Lewis, approximately 10 miles north of Waugh Lake (CDFW 2021). However, movements have been recorded between the Mt. Gibbs herd and the Central recovery unit south of the area, and between the Mt. Gibbs herd unit and the Cathedral Range Herd Unit to the east of the Project (CDFW 2018). Therefore, there is some potential that individuals may migrate or disperse within suitable habitat in the study area.

### 8.5.3.3 Game Species

Information on game species potentially present within 1 mile of the FERC Project boundary is provided in this section because of their commercial and recreational value. Game species are regulated by CDFW and are defined under the following California Fish and Game Codes:

- Resident and migratory game birds are defined in California Fish and Game Code § 3500.
- Game mammals are defined in California Fish and Game Code § 3950.
- Furbearing mammals are defined in California Fish and Game Code §4000.

Game species described in the California Fish and Game Code were evaluated for their likelihood to occur based on the geographic and elevation range of the Project and wildlife habitats present. A table was then developed listing each species and its status; followed by a generalized habitat description and a summary of applicable CDFW hunting regulations.

Table 8.5-6 lists the resident and migratory game birds, and game mammals that have the potential to occur within 1 mile of the FERC Project boundary, including their habitat requirements and a summary of state hunting regulations for each species. Hunting of game species is permitted during seasons regulated by the CDFW.

A summary of the game species occurring within 1 mile of the FERC Project boundary, including resident game birds, migratory game birds and game mammals, is provided below.

## Resident and Migratory Game Birds

Six species of game birds were observed in the study area during 2023 technical studies, including sooty grouse (*Dendragapus fuliginosus*); wood duck (*Aix sponsa*); green-winged teal (*Anas crecca*); mallard (*Anas platyrhynchos*); common merganser (*Mergus merganser*); and American coot (*Fulica americana*).

## Game Mammals

One game mammal was observed in the study area during 2023 technical studies: mule deer (*Odocoileus hemionus*).

Provided below is a description of mule deer and other game mammals occurring within 1 mile of the FERC Project boundary.

## Mule Deer

Mule deer are among the most visible and widespread wildlife species in California. The study area is within Deer Hunt Zone X9a (CDFW 2020). Deer hunting is regulated by California state law through CDFW. A hunting license and a hunting tag are required to take mule deer, and only bucks with antlers with demonstrable forks (or greater) may be taken, except during special hunts. Antlers must be forked on one side in the upper two-thirds section of the antler.

## Other Game Mammals

Other game mammals found within the study area during the 2023 technical studies include: racoon (*Procyon lotor*) and black bear (*Ursus americanus*).

Other game mammals occurring within 1 mile of the FERC Project boundary include, but are not limited to: Nuttall's cottontail (*Silvilagus nuttallii*), jackrabbits (*Lepus* spp.), beaver (*Castor canadensis*), gray fox (*Urocyon cinereoargenteus*), raccoon (*Procyon lotor*), American mink (*Mustela vison*), and American badger (*Taxidea taxus* [CSC]). Table 8.5-6 provides the status, habitat requirements, and a summary of state hunting regulations of these species.

### 8.5.4 References

CDFW (California Department of Fish and Wildlife). 2018. Sierra Nevada Bighorn Sheep Recovery Program, 2017-2018 Annual Report.

———. 2020. 2020 Deer Zone Information. General Deer Hunting Information for Zone X-9a. Deer Management Program. Sacramento, California.

———. 2021. Maps and videos showing migration patterns of the Mount Gibbs herd. Available at: http://www.dfg.ca.gov/snbs/Y_MtGibbs.html. Accessed April 7.

E. Read and Associates, Inc. 2023. Analysis of Riparian Vegetation: 2022 Field Season and Comparison to Previous Years. Rush Creek (FERC No. 1389). Final Report, April 25.

Forest Service (United States Forest Service). 2009. CALVEG/CWHR Crosswalk. USDA Forest Service Pacific Southwest Region. March 11, 2009.

———. 2019a. Inyo National Forest Species of Conservation Concern. June.

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

———. 2023. List of At-Risk and Invasive Plants for the Inyo National Forest. Provided by Blake Engelhardt, INF Botanist on February 8, 2023.

SCE (Southern California Edison Company). 2021. Rush Creek Hydroelectric Project, FERC Project No. 1389 Pre-application Document (PAD). Prepared by Southern California Edison Company. December 16, 2021.

———. 2024a. Draft TERR 1 – Botanical Resources Technical Study Report. August. Available in Supporting Document A of the Application for New License.

———. 2024b. Draft TERR 1 – Wildlife Resources Technical Study Report. August. Available in Supporting Document A of the Application for New License.

———. 2024c. Draft AQ 7 – Special-Status Amphibians Technical Study Report. August. Available in Supporting Document A of the Application for New License.

USFWS (United States Fish and Wildlife Service). 2016. Designation of Critical Habitat for Sierra Nevada Yellow-legged Frog and Northern Distinct Population Segment of the Mountain Yellow-legged Frog, and Threatened Species Status for Yosemite Toad; Final Rule (Federal Register Vol. 81, No. 166, Pages 59046–59119), August 26, 2016.

———. 2021. Birds of Conservation Concern 2021. United States Department of the Interior, U.S. Fish and Wildlife Service, Migratory Birds, Falls Church, Virginia.

# TABLES

## Table 8.5-1. Vegetation Alliances and Wildlife Habitats within the FERC Project Boundary or within 1 Mile of the FERC Project Boundary

| CalVeg Vegetation Alliance | CalVeg Code | CWHR Wildlife Habitat | CWHR Code |
|---|---|---|---|
| **Herb-Dominated Alliances** | | | |
| Alpine Grasses and Forbs Alliance | AC | Alpine Dwarf-Shrub | ADS |
| Annual Grasses and Forbs Alliance | HG | Annual Grassland | AGS |
| Wet Meadows Alliance | HJ | Fresh Emergent Wetland / Wet Meadow | WTM |
| **Shrub-Dominated Alliances** | | | |
| Alpine Mixed Scrub Alliance | AX | Alpine Dwarf-Shrub | ADS |
| Low Sagebrush Alliance | BL | Low Sage | LSG |
| Curlleaf Mountain Mahogany Alliance | BM | Eastside Pine / Sagebrush | ESP / SGB |
| Great Basin Mixed Scrub Alliance | BQ | Low Sage / Sagebrush | LSG / SBG |
| Big Sagebrush Alliance | BS | Sagebrush | SGB |
| Great Basin – Mixed Chaparral Transition Alliance | BX | Montane Chaparral / Sagebrush | MCP / SGB |
| Snowbrush Alliance | CV | Montane Chaparral | MCP |
| Upper Montane Mixed Chaparral Alliance | CX | Montane Chaparral | MCP |
| Shrub Willow Alliance | WL | Montane Riparian | MRI |
| **Tree-Dominated Alliances** | | | |
| Eastside Pine Alliance | EP | Eastside Pine | ESP |
| Jeffrey Pine Alliance | JP | Jeffrey Pine | JPN |
| Lodgepole Pine Alliance | LP | Lodgepole Pine / Subalpine Conifer | LPN / SCN |
| Mixed Conifer–Fir Alliance | MF | White Fir | WFR |
| Subalpine Conifers Alliance | SA | Subalpine Conifer | SCN |
| Whitebark Pine Alliance | WB | Subalpine Conifer | SCN |
| White Fir Alliance | WF | White Fir | WFR |
| Western (Mountain) Juniper | WJ | Juniper | JUN |
| Curlleaf Mountain Mahogany | FM | Sagebrush | SGB |
| Willow Alliance | QO | Montane Riparian | MRI |
| Quaking Aspen Alliance[1] | QQ | Aspen / Montane Riparian | ASP / MRI |
| **Non-Vegetated Areas** | | | |
| Barren | BA | Barren | BAR |
| Urban-related Non-vegetated | IB | Barren | BAR |
| Water | WA | Lacustrine / Riverine | LAC / RIV |

**Table 8.5-2. Special-Status Plant Species Known to Occur or Potentially Occurring within the FERC Project Boundary**

| Scientific/Common Name | Federal/ State Status | Inyo National Forest Status | California Rare Plant Rank (CRPR) | Blooming Period/Fertile | Habitat | Likelihood for Occurrence |
|---|---|---|---|---|---|---|
| **Known to Occur in the Study Area** | | | | | | |
| *Agrostis humilis*<br>alpine bentgrass | — | FSCC | 2B.3 | July – September | Wetlands and meadows within subalpine forest habitats from 5,000 to 11,200 feet. | **Known to occur in the FERC Project boundary.**<br>The species has been observed at low cover intermittently on two long-term riparian monitoring sites along Rush Creek Below Rush Meadows Dam since long-term monitoring was initiated in 1999 (E. Read and Associate, Inc. 2023), but the species was not detected in every year that the monitoring was conducted (it was not detected during 2009 or 2018 monitoring visits).<br>Alpine bentgrass was observed in 2022; but was not observed during the special-status plant surveys in 2023. |
| *Pinus albicaulis*<br>whitebark pine | FT | — | — | Year-round | An alpine white pine that typically occurs on cold and windy high elevation sites in western North America in subalpine forest from 7,000 to 12,000 feet. | **Known to occur in the FERC Project boundary.**<br>A total of 38 whitebark pine populations were conclusively identified in the FERC Project boundary during surveys in 2023. An additional 11 populations lacked mature bark and cones and therefore were identified as unknown five-needle pines. A total of 1,194 whitebark pine individuals were identified. |
| **Suitable Habitat is Present, Not Observed During 2023 Surveys** | | | | | | |
| *Arabis repanda var. greenei*<br>Greene's rockcress | — | — | 3.3 | July – August | Rock outcrops, talus, gravelly soil in meadows, and open pine forest from 7,600 to 11,850 feet. | May potentially occur in appropriate habitat. |
| *Astragalus johannis-howellii*<br>Long Valley milk-vetch | SR | FSCC | 1B.2 | Jun – August | Sandy areas and sagebrush scrub east of Sierra Nevada from 6,600 to 8,300 feet. | May potentially occur in appropriate habitat. |
| *Astragalus lemmonii*<br>Lemmon's milk-vetch | — | FSCC | 1B.2 | May – August | Great Basin scrub, meadows and seeps, marshes and swamps (lake shores) from 3,300 to 7,220 feet. | May potentially occur in appropriate habitat. |
| *Astragalus monoensis*<br>Mono milk-vetch | SR | FSCC | 1B.2 | June – August | Endemic to Mono County. Open areas, pumice flats in ashy to sandy soil or gravel with sparse vegetation. East of Sierra Nevada from 6,900 to 11,000 feet. | May potentially occur in appropriate habitat. |
| *Astragalus serenoi* var. *shockleyi*<br>Shockley's milk-vetch | — | FSCC | 2B.2 | May – July | Found on alkaline or granitic alluvium within Great Basin scrub or pinyon-juniper woodland habitats from 5,000 to 7,800 feet. | May potentially occur in appropriate habitat. |
| *Boechera bodiensis*<br>Bodie Hills rockcress | — | FSCC | 1B.3 | June – July | Alpine boulder and rock field, Great Basin scrub, pinyon and juniper woodland, and subalpine coniferous forest from 6,840 to 11,580 feet. | May potentially occur in appropriate habitat. |
| *Boechera cobrensis*<br>masonic rockcress | — | — | 2B.3 | June – July | Sandy soils in Great Basin scrub and pinyon and juniper woodland from 4,510 to 10,185 feet. | May potentially occur in appropriate habitat. |
| *Boechera tularensis*<br>Tulare rockcress | — | FSCC | 1B.3 | June – July | Rocky slopes in montane, subalpine habitats in the high Sierra Nevada from 5,900 to 11,000 feet. | May potentially occur in appropriate habitat. |
| *Botrychium ascendens*<br>upswept moonwort | — | FSCC | 2B.3 | July – August (spores) | Grows in lower montane coniferous forest, meadows, and seeps from 4,900 to 7,500 feet. | May potentially occur in appropriate habitat. |

| Scientific/Common Name | Federal/ State Status | Inyo National Forest Status | California Rare Plant Rank (CRPR) | Blooming Period/Fertile | Habitat | Likelihood for Occurrence |
|---|---|---|---|---|---|---|
| *Botrychium crenulatum*<br>scalloped moonwort | — | FSCC | 2B.2 | June – September (spores) | Meadows, marshes, bogs, and fens in lower and upper montane conifer forest from 4,100 to 10,800 feet. | May potentially occur in appropriate habitat. |
| *Botrychium lineare*<br>slender moonwort | — | FSCC | 1B.1 | Unknown | Meadows and seeps, subalpine coniferous forest, upper montane coniferous forest (often in disturbed areas) from 8,395 to 8,530 feet. | May potentially occur in appropriate habitat. |
| *Botrychium neolunaria*<br>common moonwort | — | — | 2B.3 | August (spores) | Meadows and seeps, moist riparian areas, subalpine coniferous forest and upper montane coniferous forest from 6,400 to 11,200 feet. | May potentially occur in appropriate habitat. |
| *Botrychium paradoxum*<br>paradox moonwort | — | — | 2B.1 | August (spores) | Moist meadows, shrubby slopes from 5,800 to 13,000 feet. | May potentially occur in appropriate habitat. |
| *Bruchia bolanderi*<br>Bolander's bruchia | — | FSCC | 4.2 | N/A | Meadows and seeps with damp soil within montane coniferous forest from 5,500 to 9,200 feet. | May potentially occur in appropriate habitat. |
| *Calyptridium pygmaeum*<br>pygmy pussypaws | — | FSCC | 1B.2 | June – August | Subalpine coniferous forest and upper montane coniferous forest from 6,495 to 10,205 feet. | May potentially occur in appropriate habitat. |
| *Carex davyi*<br>Davy's sedge | — | FSCC | 1B.3 | May – August | Dry meadows and slopes in subalpine coniferous forest and upper montane coniferous forest from 4,900 to 10,500 feet. | May potentially occur in appropriate habitat. |
| *Carex idahoa*<br>Idaho sedge | — | FSCC | 2B.3 | July | Meadows and seeps and subalpine coniferous forest from 9,500 to 10,700 feet. | May potentially occur in appropriate habitat. |
| *Carex petasata*<br>Liddon's sedge | — | FSCC | 2B.3 | May – July | Dry to wet meadows from 1,900 to 10,900 feet. | May potentially occur in appropriate habitat. |
| *Carex praticola*<br>northern meadow sedge | — | FSCC | 2B.2 | May – July | Meadows and seeps up to 10,500 feet. | May potentially occur in appropriate habitat. |
| *Carex scirpoidea* ssp. *pseudoscirpoidea*<br>western single-spiked sedge | — | FSCC | 2B.2 | July – September | Rocky, occasionally limey seasonally wet places in subalpine forest and alpine fell-fields from 6,800 to 12,200 feet. | May potentially occur in appropriate habitat. |
| *Carex stevenii*<br>Steven's sedge | — | FSCC | 2B.2 | August | Along creeks or dry meadows within alpine boulder and rock fields from 9,500 to 11,300 feet. | May potentially occur in appropriate habitat. |
| *Carex vallicola*<br>western valley sedge | — | FSCC | 2B.3 | July – August | Dry to moist montane slopes from 5,000 to 9,200 feet. | May potentially occur in appropriate habitat. |
| *Cinna bolanderi*<br>Bolander's woodreed | — | — | 1B.2 | July – September | Mesic streamsides in meadows and seeps and upper montane coniferous forest from 5,500 to 8,200 feet. | May potentially occur in appropriate habitat. |
| *Cusickiella (=Draba) quadricostata*<br>Bodie Hills cusickiella | — | — | 1B.2 | May – July | Sagebrush scrub and pinyon-juniper woodland from 6,700 to 9,300 feet. | May potentially occur in appropriate habitat. |
| *Claytonia megarhiza*<br>fell-fields claytonia | — | FSCC | 2B.3 | July – September | Gravel, talus, and rocky crevices in lodgepole forest, subalpine forest, and alpine fell-fields from 8,500 to 12,600 feet. | May potentially occur in appropriate habitat. There is an occurrence approximately 0.6 mile southwest of Waugh Lake (CNDDB 2023). |
| *Cymopterus globosus*<br>globose cymoptera | — | FSCC | 2B.2 | March – June | Sandy substrates and open flats within Great Basin scrub habitats from 4,000 to 7,200 feet. | May potentially occur in appropriate habitat. |

| Scientific/Common Name | Federal/ State Status | Inyo National Forest Status | California Rare Plant Rank (CRPR) | Blooming Period/Fertile | Habitat | Likelihood for Occurrence |
|---|---|---|---|---|---|---|
| *Dermatocarpon meiophyllizum* silverskin lichen | — | — | 2B.3 | N/A | Aquatic to semi-aquatic, within the splash zone of lakes or streams. Preferred habitat is undisturbed, exposed streams with large rocks or bedrock at high elevations and cold, deep canyons at lower elevations. Found in coastal prairie, lower and upper montane coniferous forest, North Coast coniferous forest, and subalpine conifer forest from 970 to 11,465 feet. | May potentially occur in appropriate habitat. |
| *Draba asterophora var. asterophora* Tahoe draba | — | — | 1B.2 | July – August | Decomposed granite, open talus slopes, rock outcrops and crevices in subalpine coniferous woodland and alpine rock fields from 8,200 to 11,500 feet. | May potentially occur in appropriate habitat. |
| *Draba cana* canescent draba | — | — | 2B.3 | July | Rock crevices and outcrops in subalpine to alpine meadows from 8,000 to 13,000 feet. | May potentially occur in appropriate habitat. |
| *Draba cruciata* Mineral King draba | — | — | 1B.3 | June – August | Gravelly substrates in subalpine coniferous forest from 8,200 to 10,875 feet. | May potentially occur in appropriate habitat. |
| *Draba incrassata* Sweetwater Mountains draba | — | — | 1B.3 | July – August | Alpine boulder and rock field from 8,200 to 13,010 feet. | May potentially occur in appropriate habitat. |
| *Draba praealta* tall draba | — | — | 2B.3 | July – August | Wetlands, streambanks, or riparian areas in montane or subalpine moist meadows, forests, or cliffs in the high Sierra Nevada from 8,200 to 11,200 feet. | May potentially occur in appropriate habitat. |
| *Dryopteris filix-mas* male fern | — | FSCC | 2B.3 | July – September | Rocky and granitic substrates within upper montane coniferous forest habitats from 6,100 to 10,400 feet. | May potentially occur in appropriate habitat. |
| *Elodium (=Helodium) blandowii* Blandow's bog moss | — | FSCC | 2B.2 | N/A | Grows in wet meadows, fens, and seeps in subalpine coniferous forest and alpine lakes from 6,100 to 9,000 feet. | May potentially occur in appropriate habitat. |
| *Erigeron aequifolius* Hall's daisy | — | — | 1B.3 | June – August | Broadleafed upland forest, lower montane coniferous forest, pinyon and juniper woodland, upper montane coniferous forest from 4,920 to 8,005 feet. | May potentially occur in appropriate habitat. |
| *Erigeron uncialis* var. *uncialis* limestone daisy | — | FSCC | 1B.2 | May – July | Great Basin scrub, pinyon and juniper woodland, and subalpine coniferous forest from 6,230 to 9,515 feet. | May potentially occur in appropriate habitat. |
| *Eriogonum mensicola* Pinyon Mesa buckwheat | — | FSCC | 1B.3 | July – September | Rocky or gravelly substrates within Great Basin scrub, pinyon-juniper woodland, or upper montane coniferous forest habitats from 6,000 to 9,400 feet. | May potentially occur in appropriate habitat. |
| *Eriogonum nutans* var. *nutans* nodding buckwheat | — | — | 2B.3 | May – September | Sagebrush scrub, northern juniper woodland, chenopod scrub, and Great Basin scrub from 4,000 to 10,000 feet. | May potentially occur in appropriate habitat. |
| *Festuca minutiflora* small-flowered fescue | — | — | 2B.3 | July | Moist, shady banks in subalpine forest, bristlecone pine forest, and alpine fell-fields from 9,000 to 13,300 feet. | May potentially occur in appropriate habitat. There is an occurrence approximately 4.2 miles north of the study area. (CNDDB 2023). |
| *Hackelia brevicula* Poison Canyon stickseed | — | FSCC | 3.3 | July – August | Dry creek bottoms and openings (often rocky) within broadleaf upland forest, Great Basin scrub, and subalpine coniferous forest habitats from 8,600 to 10,700 feet. | May potentially occur in appropriate habitat. |

| Scientific/Common Name | Federal/ State Status | Inyo National Forest Status | California Rare Plant Rank (CRPR) | Blooming Period/Fertile | Habitat | Likelihood for Occurrence |
|---|---|---|---|---|---|---|
| *Helodium blandowii*<br>Blandow's bog moss | — | FSCC | 2B.3 | N/A | Grows in wet meadows, fens, and seeps in subalpine coniferous forest and alpine lakes from 6,100 to 9,000 feet. | May potentially occur in appropriate habitat. |
| *Hulsea brevifolia*<br>short-leaved hulsea | — | FSCC | 1B.2 | May – August | Granitic or volcanic soils in openings and under canopy in mixed conifer and red fir forest from 4,500 to 10,500 feet. | May potentially occur in appropriate habitat. |
| *Hulsea vestita* ssp. *inyoensis*<br>Inyo hulsea | — | FSCC | 2B.2 | April – June | Rocky soils in chenopod scrub, Great Basin scrub, and pinyon and juniper woodland from 5,400 to 10,000 feet. | May potentially occur in appropriate habitat. |
| *Jamesia americana* var. *rosea*<br>fivepetal (rosy-petalled) cliffbush | — | FSCC | 4.3 | May – September | Granitic or carbonate rocky soils in alpine boulder and rock field, Great Basin scrub, pinyon and juniper woodland, and subalpine coniferous forest from 6,600 to 12,400 feet. | May potentially occur in appropriate habitat. |
| *Kobresia myosuroides (= bellardii)*<br>seep kobresia | — | FSCC | 2B.2 | August | Alpine boulder and rock field on mesic soils, carbonate meadows and seeps, and subalpine coniferous forest from 5,000 to 10,900 feet. Only known from Mono County in California. | May potentially occur in appropriate habitat. |
| *Lupinus duranii*<br>Mono Lake lupine | — | FSCC | 1B.2 | May – August | Sparsely vegetated open pumice flats in loose sandy or gravelly soil in Great Basin scrub, subalpine coniferous, and upper montane coniferous forest from 6,500 to 9,900 feet. | May potentially occur in appropriate habitat. |
| *Lupinus lepidus* var. *culbertsonii*<br>Hockett Meadows lupine | — | — | 1B.3 | July – August | Meadows and seeps, and mesic, rocky soils in upper montane coniferous forest from 8,005 to 9,845 feet. | May potentially occur in appropriate habitat. |
| *Lupinus padre-crowleyi*<br>Father Crowley's lupine | SR | FSCC | 1B.2 | July – August | Decomposed granite soils in Great Basin scrub, riparian forest, riparian scrub, and upper montane coniferous forest from 7,215 to 13,125 feet. | May potentially occur in appropriate habitat. |
| *Meesia longiseta*<br>long seta hump moss | — | — | 2B.3 | N/A | Moss found in bogs, fens, meadows and seeps in upper mountain coniferous forest from 5,700 to 10,000 feet. | May potentially occur in appropriate habitat. |
| *Meesia uliginosa*<br>broad-nerved hump moss | — | — | 2B.2 | July – October (spores) | Grows in permanently wet, primarily spring-fed meadows and fens in montane to subalpine coniferous forest from 4,200 to 9,200 feet. | May potentially occur in appropriate habitat. |
| *Mentzelia torreyi*<br>Torrey's blazing star | — | FSCC | 2B.2 | June – August | Great Basin scrub, Mojavean desert scrub, and pinyon and juniper woodland from 3,835 to 9,300 feet. | May potentially occur in appropriate habitat. |
| *Monardella beneolens*<br>sweet-smelling monardella | — | FSCC | 1B.3 | June – September | Alpine boulder and rock field, subalpine coniferous forest, and upper montane coniferous forest from 8,120 to 11,485 feet. | May potentially occur in appropriate habitat. |
| *Parnassia parviflora*<br>small-flowered grass-of-Parnassus | — | — | 2B.2 | August – September | Wetlands, riparian areas, and rocky seeps in the high Sierra Nevada from 6,300 to 9,500 feet. | May potentially occur in appropriate habitat. |
| *Pedicularis crenulata*<br>scalloped-leaved lousewort | — | — | 2B.2 | June – July | Meadows and seeps, and wetland-riparian areas from 7,000 to 7,700 feet. | May potentially occur in appropriate habitat. |
| *Petrophytum (=Petrophyton) caespitosum* ssp. *acuminatum*<br>marble rockmat | — | FSCC | 1B.3 | August – September | Rocky crevices in lower montane coniferous forest and upper montane coniferous forest from 3,330 to 7,545 feet. | May potentially occur in appropriate habitat. |

| Scientific/Common Name | Federal/ State Status | Inyo National Forest Status | California Rare Plant Rank (CRPR) | Blooming Period/Fertile | Habitat | Likelihood for Occurrence |
|---|---|---|---|---|---|---|
| *Phacelia monoensis*<br>Mono County phacelia | — | FSCC | 1B.1 | May – July | Great Basin scrub and pinyon and juniper woodland from 6,230 to 9,515 feet. | May potentially occur in appropriate habitat. |
| *Physaria ludoviciana*<br>silver bladderpod | — | FSCC | 2B.2 | May – June | Great Basin scrub habitats. | May potentially occur in appropriate habitat. |
| *Pohlia tundrae*<br>tundra thread moss | — | — | 2B.3 | N/A | Alpine meadows and seeps from 8,888 to 9,900 feet. | May potentially occur in appropriate habitat. |
| *Polyctenium williamsiae*<br>Williams' combleaf | — | FSCC | 1B.2 | March – July | Great Basin scrub, marshes and swamps, pinyon and juniper woodland, playas, and vernal pools from 4,415 to 8,860 feet. | May potentially occur in appropriate habitat. |
| *Potamogeton praelongus*<br>white-stemmed pondweed | — | — | 2B.3 | July – August | Deep water in lakes, marshes, and swamps from 6,000 to 10,000 feet. | May potentially occur in appropriate habitat. |
| *Potamogeton robbinsii*<br>Robbins' pondweed | — | — | 2B.3 | July – August | Shallow to deep water of ponds, lakes, and slow-flowing rivers from 5,000 to 10,900 feet. | May potentially occur in appropriate habitat. |
| *Potentilla pulcherrima*<br>beautiful cinquefoil | — | FSCC | 2B.2 | July | Great basin scrub habitats. | May potentially occur in appropriate habitat. |
| *Ranunculus hydrocharoides*<br>frog's-bit buttercup | — | FSCC | 2B.1 | June – September | Freshwater marshes and swamps and sinks, flats, and lake margins from 3,700 to 9,000 feet. | May potentially occur in appropriate habitat. |
| *Sabulina stricta*<br>bog sandwort | — | — | 2B.3 | July – September | Granitic gravels, sandy wet spots, meadows and seeps, alpine areas from 8,000 to 13,000 feet. | May potentially occur in appropriate habitat. There is an occurrence approximately 0.5 mile south of Waugh Lake (CNDDB 2023). |
| *Salix brachycarpa* var. *brachycarpa*<br>short-fruited willow | — | — | 2B.3 | June – August | Subalpine forest, alpine fell-fields, and wetland or riparian areas, especially on limestone, from 4,900 to 8,200 feet. | May potentially occur in appropriate habitat. |
| *Sclerocactus polyancistrus*<br>redspined fishhook cactus | — | FSCC | 4.2 | April – July | Carbonate soils in Great Basin scrub, Joshua tree woodland, and Mojave desert scrub from 2,100 to 7,800 feet. | May potentially occur in appropriate habitat. |
| *Silene oregana*<br>Oregon campion | — | — | 2B.2 | July – September | Sagebrush scrub and subalpine conifer forest from 4,900 to 8,200 feet. | May potentially occur in appropriate habitat. |
| *Solorina spongiosa*<br>fringed chocolate chip lichen | — | FSCC | 2B.2 | N/A | Carbonate moss mats in meadows and seeps in subalpine coniferous forest. | May potentially occur in appropriate habitat. |
| *Sphaeromeria potentilloides* var. *nitrophila*<br>fivefinger chickensage (alkali tansy-sage) | — | FSCC | 2B.2 | June – July | Alkaline soils in meadows and seeps and playas from 7,000 to 8,000 feet. | May potentially occur in appropriate habitat. |
| *Tetradymia tetrameres*<br>dune horsebrush | — | FSCC | 2B.2 | August | Sandy soils in Great Basin scrub from 4,000 to 7,200 feet. | May potentially occur in appropriate habitat. |
| *Thelypodium integrifolium* ssp. *complanatum*<br>foxtail thelypodium | — | FSCC | 2B.2 | June – October | Alkaline or subalkaline, mesic soils in Great Basin scrub and meadows and seeps from 3,600 to 8,400 feet. | May potentially occur in appropriate habitat. |
| *Thelypodium milleflorum*<br>many-flowered theylopodium | — | FSCC | 2B.2 | April – June | Chenopod scrub and sandy soils in Great Basin scrub from 4,000 to 8,400 feet. | May potentially occur in appropriate habitat. |
| *Trichophorum pumilum*<br>little bulrush | — | FSCC | 2B.2 | August | Riverbanks and carbonate soils in bogs and fens, marshes and swamps, and riparian scrub from 9,500 to 10,900 feet. | May potentially occur in appropriate habitat. |

| Scientific/Common Name | Federal/ State Status | Inyo National Forest Status | California Rare Plant Rank (CRPR) | Blooming Period/Fertile | Habitat | Likelihood for Occurrence |
|---|---|---|---|---|---|---|
| *Trifolium bolanderi*<br>Bolander's clover | — | — | 1B.2 | June – August | Mesic soils in meadows and seeps and lower and upper montane coniferous forest from 6,700 to 8,700 feet. | May potentially occur in appropriate habitat. |
| *Trifolium dedeckerae (= kingii ssp. dedeckerae)*<br>Dedecker's clover | — | FSCC | 1B.3 | May – July | Granitic, rocky soils in pinyon and juniper woodland, lower and upper montane coniferous forest, and subalpine coniferous forest from 7,000 to 11,700 feet. | May potentially occur in appropriate habitat. |
| *Triglochin palustris*<br>marsh arrow-grass | — | — | 2B.3 | July – August | Meadows and seeps, freshwater marshes and swamps, and subalpine coniferous forest from 7,495 to 12,140 feet. | May potentially occur in appropriate habitat. |
| *Viola pinetorum* ssp. *grisea*<br>gray-leaved violet | — | — | 1B.2 | April – July | Meadows and seeps, subalpine coniferous forest, and upper montane coniferous forest from 5,000 to 11,400 feet. | May potentially occur in appropriate habitat. |
| *Viola purpurea* ssp. *aurea*<br>golden violet | — | FSCC | 2B.2 | April – June | Sandy slopes in sagebrush scrub and pinyon-juniper woodland from 3,200 to 8,200 feet. | May potentially occur in appropriate habitat. |
| **Unlikely to Occur in the FERC Project Boundary or within 1 Mile of the Boundary** | | | | | | |
| *Abronia alpina*<br>alpine sand verbena (Ramshaw Meadows abronia) | — | FSCC | 1B.1 | July – August | Meadows and seeps (granitic, gravelly margins) from 7,870 to 8,860 feet. Only known from the Ramshaw Meadows area of the Kern Plateau. | Unlikely to occur. The study area is outside the geographic range of the species. |
| *Allium atrorubens* var. *atrorubens*<br>Great Basin onion | — | FSCC | 2B.3 | May – June | Sagebrush scrub and pinyon-juniper woodland from 4,000 to 7,000 feet. | Unlikely to occur. The study area is outside the elevational range of the species. |
| *Astragalus cimae* var. *sufflatus*<br>inflated milk-vetch | — | FSCC | 1B.3 | April – June | Great Basin scrub, pinyon and juniper woodland from 4,920 to 6,810 feet. | Unlikely to occur. The study area is outside the elevational range of the species. |
| *Astragalus inyoensis*<br>Inyo milk-vetch | — | FSCC | 4.2 | May – June | Pinyon-juniper woodland from 5,000 to 8,900 feet. | Unlikely to occur. The Project vicinity does not support pinyon-juniper woodland habitat. |
| *Astragalus kentrophyta* var. *elatus*<br>spiny-leaved milk-vetch | — | FSCC | 2B.2 | June – September | Subalpine forest from 9,600 to 10,700 feet. | Unlikely to occur. The study area is outside the elevational range of the species. |
| *Astragalus lentiginosus* var. *kernensis*<br>Kern Plateau milk-vetch | — | FSCC | 1B.2 | June – July | Meadows and seeps, subalpine coniferous forest from 7,345 to 9,020 feet. Only known from the Kern Plateau and vicinity. | Unlikely to occur. The study area is outside the geographic range of the species. |
| *Astragalus ravenii*<br>Raven's milk-vetch | — | FSCC | 1B.3 | July – September | Alpine boulder and rock field, upper montane coniferous forest from 11,005 to 11,350 feet. | Unlikely to occur. The study area is outside the elevational range of the species. |
| *Astragalus subvestitus*<br>Kern County milk-vetch | — | FSCC | 4.3 | June – July | Found on sandy or gravelly substrates within meadows, Great Basin scrub, or pinyon-juniper woodland habitats from 7,700 to 9,200 feet. Only known from the Kern Plateau region on the Inyo National Forest. | Unlikely to occur. The study area is outside the geographic range of the species. |
| *Atriplex pusilla*<br>smooth saltbush | — | — | 2B.1 | June – September | Found on alkali soils in Great Basin scrub, meadows and seeps near hot springs from 4,300 to 6,700 feet. | Unlikely to occur. The study area is outside the elevational range of the species. |
| *Boechera pendulina*<br>rabbit-ear rockcress | — | FSCC | 2B.1 | April – June | Gravelly or rocky soils within Great Basin scrub or pinyon-juniper woodland habitats from 10,100 to 10,700 feet. | Unlikely to occur. The study area is outside the elevational range of the species. |
| *Boechera pinzliae*<br>Pinzl's rockcress | — | FSCC | 1B.3 | July | Gravelly granitic soil in alpine and subalpine areas in the White and Inyo Mountains from 9,800 to 11,200 feet. | Unlikely to occur. The study area is outside the elevational and geographic range of the species. |

| Scientific/Common Name | Federal/ State Status | Inyo National Forest Status | California Rare Plant Rank (CRPR) | Blooming Period/Fertile | Habitat | Likelihood for Occurrence |
|---|---|---|---|---|---|---|
| *Boechera shockleyi*<br>Shockley's rockcress | — | FSCC | 2B.2 | May – June | Carbonate or quartzite, rocky or gravelly soils in pinyon and juniper woodland from 2,870 to 7,580 feet. Only known from the White and Inyo Mountains. | Unlikely to occur. The study area is outside the geographic range of the species. |
| *Boechera (=Arabis) tiehmii*<br>Tiehm's rockcress | — | FSCC | 1B.3 | July – August | Rock outcrops, gravelly soil on windswept rocky ridges and in crevices in the high Sierra Nevada from 9,800 to 11,800 feet. | Unlikely to occur. The study area is outside the elevational range of the species. |
| *Botrychium minganense*<br>Mingan moonwort | — | FSCC | 4.2 | July – September (spores) | Meadows, marshes, bogs, and fens in lower and upper montane conifer forest from 4,500 to 7,000 feet. | Unlikely to occur. The study area is outside the elevational range of the species. |
| *Botrychium tunux*<br>moosewort | — | — | 2B.1 | August – September (spores) | Alpine boulder and rock field at approximately 10,005 feet. | Unlikely to occur. The study area is outside the elevational range of the species. |
| *Botrychium yaaxudakeit*<br>giant moonwort | — | — | 2B.1 | August (spores) | Alpine boulder and rock field (meadows) at approximately 10,500 feet. | Unlikely to occur. The study area is outside the elevational range of the species. |
| *Calochortus excavatus*<br>Inyo County star-tulip | — | FSCC | 1B.1 | April – July | Chenopod scrub, meadows and seeps from 3,770 to 6,560 feet. | Unlikely to occur. The study area is outside the elevational range of the species. |
| *Carex duriuscula*<br>spikerush sedge | — | FSCC | 2B.3 | July – August | Great Basin scrub and subalpine coniferous forest from 11,600 to 13,700 feet. | Unlikely to occur. The study area is outside the elevational range of the species. |
| *Carex tiogana*<br>Tioga Pass sedge | — | FSCC | 1B.3 | July – August | Coarse, wet, limey soil; subalpine to alpine meadows, seeps, and lake margins from 9,800 to 11,000 feet. | Unlikely to occur. The study area is outside the elevational range of the species. |
| *Chaetadelpha wheeleri*<br>Wheeler's dune-broom | — | FSCC | 2B.2 | April – September | Sandy substrates within dunes, Great Basin scrub, or Mojavean desert habitats from 2,650 to 6,400 feet. | Unlikely to occur. The study area is outside the elevational range of the species. |
| *Cladium californicum*<br>California sawgrass | — | — | 2B.2 | June – September | Meadows and seeps, marshes and swamps alkaline or freshwater from 195 to 5,250 feet. | Unlikely to occur. The study area is outside the elevational range of the species. |
| *Cordylanthus eremicus* ssp. *kernensis*<br>Kern Plateau bird's beak | — | FSCC | 1B.3 | July – September | Great Basin scrub, Joshua tree woodland, pinyon and juniper woodland, upper montane coniferous forest from 5,495 to 9,845 feet. Only known from the Kern Plateau and vicinity. | Unlikely to occur. The study area is outside the geographic range of the species. |
| *Crepis runcinata* ssp. *hallii*<br>Hall's meadow hawksbeard | — | FSCC | — | May – July | Mesic areas with alkaline soils within Mojavean desert or pinyon-juniper woodland habitats from 4,200 to 4,900 feet. | Unlikely to occur. The study area is outside the elevational range of the species. |
| *Cryptantha incana*<br>Tulare cyptantha | — | — | 1B.3 | June – August | Gravelly or rocky soils in lower montane coniferous forest from 4,690 to 7,055 feet. | Unlikely to occur. The study area is outside the elevational range of the species. |
| *Cuniculotinus (=Chrysothamnus) gramineus*<br>Panamint rock-goldenrod | — | FSCC | 2B.3 | June – August | Carbonate or rocky substrates within pinyon-juniper woodlands and subalpine coniferous forest habitats from 6,800 to 9,700 feet. Only known from the Inyo and Panamint mountains. | Unlikely to occur. The study area is outside the geographic range of the species. |
| *Dedeckera eurekensis*<br>July gold | SR | FSCC | 1B.3 | May – August | Carbonate substrates in Mojave and desert scrub from 3,985 to 7,220 feet | Unlikely to occur. No appropriate habitat is present in the Project vicinity. |
| *Draba californica*<br>California draba | — | FSCC | 4.2 | July – August | Meadows and seeps within alpine boulder and rock fields from 10,000 to 14,000 feet. | Unlikely to occur. The study area is outside the elevational range of the species. |
| *Draba monoensis*<br>White Mountains draba | — | FSCC | 1B.2 | August | Alpine boulder and rock field, meadows and seeps from 9,840 to 12,990 feet. | Unlikely to occur. The study area is outside the elevational range of the species. |

| Scientific/Common Name | Federal/ State Status | Inyo National Forest Status | California Rare Plant Rank (CRPR) | Blooming Period/Fertile | Habitat | Likelihood for Occurrence |
|---|---|---|---|---|---|---|
| *Draba sharsmithii*<br>Mt. Whitney draba | — | FSCC | 1B.3 | July – August | Alpine boulder and rock field, subalpine coniferous forest from 10,825 to 12,990 feet. | Unlikely to occur. The study area is outside the elevational range of the species. |
| *Elymus scribneri*<br>Scribner's wheat grass | — | — | 2B.3 | July – August | Alpine boulder and rock fields from 9,510 to 13,780 feet. | Unlikely to occur. The study area is outside the elevational range of the species. |
| *Eremothera boothii* ssp. *boothii*<br>Booth's evening-primrose | — | — | 2B.3 | April – September | Sandy flats and slopes in Joshua tree and pinyon/juniper woodland from 2,600 to 7,900 feet. | Unlikely to occur. No appropriate habitat is present in the Project vicinity. |
| *Eremothera boothii* ssp. *intermedia*<br>Booth's hairy evening-primrose | — | — | 2B.3 | June | Sandy soils in sagebrush scrub from 4,900 to 7,054 feet. | Unlikely to occur. The study area is outside the elevational range of the species. |
| *Ericameria gilmanii*<br>Gilman's goldenbush | — | FSCC | 1B.3 | August – September | Subalpine coniferous forest, upper montane coniferous forest from 6,885 to 11,155 feet. Only known from a single population in the White Mountains on the Inyo National Forest. | Unlikely to occur. The study area is outside the geographic range of the species. |
| *Erigeron compactus*<br>compact daisy | — | FSCC | 2B.3 | May – July | Rocky or gravelly substrates within pinyon-juniper woodland habitats from 4,300 to 9,700 feet. | Unlikely to occur. No appropriate habitat is present in the Project vicinity. |
| *Erigeron multiceps*<br>*Kern River daisy* | — | — | 1B.2 | June – September | Meadows and seeps, and openings in upper montane coniferous forest from 4,920 to 8,315 feet. Known only from the Kern Plateau. | Unlikely to occur. The study area is outside the geographic range of the species. |
| *Eriogonum alexanderae (=Eriogonum ochrocephalum* var. *ochrocephalum)*<br>Alexander's buckwheat | — | FSCC | 1B.1 | May – July | Shale or gravelly substrates within Great Basin scrub or pinyon-juniper woodland habitats. Known only between Potato Peak and Bodie Mountain. | Unlikely to occur. The study area is outside the geographic range of the species. |
| *Eriogonum wrightii* var. *olanchense*<br>Olancha Peak buckwheat | — | FSCC | 1B.3 | July – September | Alpine boulder and rock field and gravelly, rocky areas in subalpine coniferous forest from 10,695 to 11,600 feet | Unlikely to occur. The study area is outside the elevational range of the species. |
| *Erythranthe utahensis*<br>Utah monkeyflower | — | — | 2B.1 | April | Meadows and seeps, pinyon and juniper woodland from 2,000 to 6,560 feet. | Unlikely to occur. The study area is outside the elevational range of the species. |
| *Goodmania luteola*<br>yellow spinecape | — | FSCC | 4.2 | April – August | Alkaline or clay substrates within meadows, seeps, or playas within Mojavean desert scrub or valley/foothill grassland habitats from 70 to 7,400 feet. | Unlikely to occur. No appropriate habitat is present in the study area. |
| *Greeneocharis (=Cryptantha) circumscissa var. rosulata*<br>Rosetta cushion cryptantha | — | FSCC | 1B.2 | July – August | Alpine boulder and rock field, subalpine coniferous forest from 9,675 to 12,010 feet. | Unlikely to occur. The study area is outside the elevational range of the species. |
| *Grusonia pulchella*<br>beautiful cholla | — | FSCC | 2B.2 | May | Sandy substrates within desert dunes, Great Basin scrub, or Mojavean desert scrub habitats from 5,000 to 6,600 feet. | Unlikely to occur. The study area is outside the elevational range of the species. |
| *Hackelia sharsmithii*<br>Sharsmith's stickseed | — | FSCC | 2B.3 | July – September | Granitic or rocky substrates within alpine boulder/rock fields or subalpine coniferous forest habitats from 10,000 to 12,400 feet. | Unlikely to occur. The study area is outside the elevational range of the species. |
| *Hesperidanthus jaegeri*<br>Jaeger's hesperidanthus | — | FSCC | 1B.2 | May – July | Great Basin scrub, pinyon and juniper woodland, and subalpine coniferous forest from 7,000 to 9,185 feet. Known only from the Inyo Mountains. | Unlikely to occur. The study area is outside the geographic range of the species. |
| *Hordeum intercedens*<br>vernal barley | — | — | 3.2 | March – June | Coastal dunes, Coastal scrub, valley and foothill grassland (saline flats and depressions), vernal pools from 15 to 3,280 feet. | Unlikely to occur. The study area is outside the elevational range of the species. |

| Scientific/Common Name | Federal/ State Status | Inyo National Forest Status | California Rare Plant Rank (CRPR) | Blooming Period/Fertile | Habitat | Likelihood for Occurrence |
|---|---|---|---|---|---|---|
| *Horkelia hispidula*<br>White Mountains horkelia | — | FSCC | 1B.3 | June – August | Alpine dwarf scrub, Great Basin scrub, and subalpine coniferous forest from 9,840 to 11,155 feet. | Unlikely to occur. The study area is outside the elevational range of the species. |
| *Ivesia campestris*<br>field ivesia | — | FSCC | 1B.2 | May – August | Edges of meadows and seeps, subalpine coniferous forest, and upper montane coniferous forest from 6,500 to 11,400 feet. Endemic to the Kern Plateau. | Unlikely to occur. The study area is outside the geographic range of the species. |
| *Ivesia kingii* var. *kingii*<br>alkali ivesia | — | FSCC | 2B.2 | May – August | Mesic, alkaline, or clay soils in Great Basin scrub, meadows and seeps, and playas from 4,000 to 7,100 feet. | Unlikely to occur. The study area is outside the elevational range of the species. |
| *Ladeania lanceolata (=Psoralidium lanceolatum)*<br>lanceleaved scurf-pea | — | FSCC | 2B.3 | April – August | Sandy soils in Great Basin scrub from 4,000 to 8,400 feet. Only known east of Highway 395 in Mono County. | Unlikely to occur. The study area is outside the geographic range of the species. |
| *Lomatium foeniculaceum* ssp. *inyoense*<br>Inyo biscuitroot | — | FSCC | 4.3 | June – July | Carbonate soils in subalpine coniferous forest from 7,300 to 10,700 feet. Only known from the White and Inyo Mountains in California. | Unlikely to occur. The study area is outside the geographic range of the species. |
| *Lupinus gracilentus*<br>slender lupine | — | — | 1B.3 | July – August | Subalpine coniferous forest from 6,000 to 11,500 feet. Currently known only from the Yosemite Valley. | Unlikely to occur. The study area is outside the geographic range of the species. |
| *Mentzelia inyoensis*<br>Inyo blazing star | — | FSCC | 1B.1 | April – October | Rocky, carbonate soils in Great Basin scrub and pinyon and juniper woodland from 3,795 to 6,495 feet. | Unlikely to occur. The study area is outside the elevational range of the species. |
| *Oreocarya (=Cryptantha) roosiorum*<br>bristlecone cryptantha | SR | FSCC | 1B.2 | June – July | Carbonate, rocky soils in subalpine coniferous forest from 8,005 to 10,595 feet. Only known from the Inyo Mountains. | Unlikely to occur. The study area is outside the geographic range of the species. |
| *Oxytropis deflexa* var. *sericea*<br>blue pendant-pod oxytrope | — | FSCC | 2B.1 | June – August | Meadows and seeps and upper montane coniferous forest from 9,300 to 11,200 feet. Known only from the White Mountains. | Unlikely to occur. The study area is outside the geographic range of the species. |
| *Penstemon calcareus*<br>limestone beardtongue | — | FSCC | 1B.3 | April – May | Carbonate and rocky soils in Joshua tree woodland, Mojave desert scrub, and pinyon and juniper woodland from 3,500 to 6,800 feet. | Unlikely to occur. The study area is outside the elevational range of the species. |
| *Phacelia inyoensis*<br>Inyo phacelia | — | FSCC | 1B.2 | April – August | Alkaline meadow margins and desert scrub seeps from 3,000 to 10,500 feet. | Unlikely to occur. No appropriate habitat is present in the study area. |
| *Phacelia nashiana*<br>Charlotte's phacelia | — | FSCC | 1B.2 | March – June | Granitic, sandy soils in Joshua tree woodland, Mojave desert scrub, and pinyon and juniper woodland from 2,000 to 7,400 feet in elevation. | Unlikely to occur. No appropriate habitat is present in the study area. |
| *Physocarpus alternans*<br>Nevada ninebark | — | FSCC | 2B.3 | June – July | Rocky carbonate soils in pinyon and juniper woodland from 6,000 to 10,400 feet. | Unlikely to occur. No appropriate habitat is present in the Project vicinity. |
| *Plagiobothrys parishii*<br>Parish's popcornflower | — | FSCC | 1B.1 | March – June | Alkaline or mesic soils in Great Basin scrub and Joshua tree woodland from 2,460 to 4,595 feet. | Unlikely to occur. The study area is outside the elevational range of the species. |
| *Polemonium chartaceum*<br>Mason's sky pilot | — | FSCC | 1B.3 | June – August | Alpine boulder and rock field, subalpine coniferous forest from 10,790 to 14,010 feet. | Unlikely to occur. The study area is outside the elevational range of the species. |
| *Populus angustifolia*<br>narrow-leaved cottonwood | — | FSCC | 2B.2 | March – April | Riparian forests on the east slope of the Sierras and other mountain ranges from 4,000 to 6,000 feet. | Unlikely to occur. The study area is outside the elevational range of the species. |
| *Potentilla morefieldii*<br>Morefield's cinquefoil | — | FSCC | 1B.3 | July – September | Carbonate substrates in alpine boulder and rock field from 10,710 to 13,125 feet. | Unlikely to occur. The study area is outside the elevational range of the species. |

| Scientific/Common Name | Federal/ State Status | Inyo National Forest Status | California Rare Plant Rank (CRPR) | Blooming Period/Fertile | Habitat | Likelihood for Occurrence |
|---|---|---|---|---|---|---|
| *Puccinellia simplex*<br>California alkali grass | — | — | 1B.2 | March – May | Alkaline, vernally mesic areas in chenopod scrub, meadows and seeps, valley and foothill grassland, and vernal pools from 5 to 3,050 feet. | Unlikely to occur. The study area is outside the elevational range of the species. |
| *Salix nivalis*<br>snow willow | — | — | 2B.3 | June – July | Alpine cirques from 10,000 to 11,500 feet. | Unlikely to occur. The study area is outside the elevational range of the species. |
| *Sibaropsis hammittii*<br>Hammitt's clay-cress | — | — | 1B.2 | March – April | Openings in chaparral and valley and foothill grassland from 2,360 to 3,495 feet. | Unlikely to occur. The study area is outside the elevational range of the species. |
| *Sphenopholis obtusata*<br>prairie wedge grass | — | FSCC | 2B.2 | April – July | Mesic soils in cismontane woodland and meadows and seeps from 1,000 to 6,700 feet. | Unlikely to occur. The study area is outside the elevational range of the species. |
| *Stipa divaricata*<br>small-flowered ricegrass | — | FSCC | 2B.3 | June – September | Gravelly or carbonate soils in pinyon and juniper woodland from 2,300 to 9,900 feet. | Unlikely to occur. No appropriate habitat is present in the Project vicinity. |
| *Strepthantus gracilis*<br>alpine jewelflower | — | FSCC | 1B.3 | July – August | Granitic, rocky soils in subalpine coniferous forest and upper montane coniferous forest from 9,300 to 11,700 feet. Only known from the Kings-Kern Divide at the intersection of Tulare, Fresno, and Inyo counties. | Unlikely to occur. The study area is outside the geographic range of the species. |
| *Streptanthus howellii*<br>Howell’s jewelflower | — | — | 1B.2 | July – August | Serpentinite and rocky soils in lower montane coniferous forest from 1,000 to 4,920 feet. | Unlikely to occur. The study area is outside the elevational range of the species. |
| *Streptanthus oliganthus*<br>masonic mountain jewelflower | — | FSCC | 1B.2 | June – July | Volcanic or granitic soils in pinyon-juniper woodland from 6,600 to 10,200 feet. | Unlikely to occur. No appropriate habitat is present in the Project vicinity. |
| *Stuckenia filiformis* ssp. *alpina*<br>slender-leaved pondweed | — | — | 2B.2 | May – July | Shallow, clear water of freshwater wetlands, lakes, and drainage channels from 900 to 7,100 feet. | Unlikely to occur. The study area is outside the elevational range of the species. |
| *Stylocline masonii*<br>Mason's neststraw | — | — | 1B.1 | March – May | Sandy soils in chenopod scrub and pinyon and juniper woodland from 325 to 3,935 feet. | Unlikely to occur. The study area is outside the elevational range of the species. |
| *Taraxacum ceratophorum*<br>horned dandelion | — | FSCC | 2B.1 | June – July | Carbonate soils in alpine boulder and rock fields, meadows and seeps, and mesic valley and foot hill grassland from 9,600 to 12,100 feet. | Unlikely to occur. The study area is outside the elevational range of the species. |
| *Townsendia leptotes*<br>slender townsendia | — | FSCC | 2B.3 | June – August | Alpine boulder and rock fields from 10,900 to 12,700 feet. | Unlikely to occur. The study area is outside the elevational range of the species. |
| *Transberingia bursifolia* ssp. *virgata (=Halimolobos virgata)*<br>virgate halimolobos | — | FSCC | 2B.3 | July | Meadows and seeps and pinyon and juniper woodland from 6,600 to 10,000 feet. Known only from the Inyo and White mountains. | Unlikely to occur. The study area is outside the geographic range of the species. |

*Sources: CNDDB 2020, SCE 2018, SCE 2020*

LEGEND:

<u>Federal Status</u>
FC = Candidate Species
FE = Federal Endangered
FT = Federal Threatened
FSCC = Inyo National Forest Service Species of Conservation Concern

State Status
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)

### Table 8.5-3. Whitebark Pine Populations Identified within the FERC Project Boundary

| Scientific Name | Common Name | Population ID | Area | | Number of Individuals/Percent Cover | | Associated Vegetation Alliance |
|---|---|---|---|---|---|---|---|
| | | | Acres | Square Feet | Confirmed Whitebark Pines | Unknown Five-needle Pines[1] | |
| **Rush Meadows Dam Area** | | | | | | | |
| *Pinus albicaulis* | Whitebark pine | PIAL 1 | 19.52 | 850,313 | 658 | 801 | Lodgepole Pine, Subalpine Conifer |
| | | PIAL 2 | 0.69 | 29,924 | 6 | 3 | Subalpine Conifer |
| | | PIAL 3 | 1.18 | 51,224 | 5 | 14 | Subalpine Conifer |
| | | PIAL 4 | 0.09 | 3,781 | 1 | 1 | Subalpine Conifer |
| | | PIAL 5 | 1.07 | 46,419 | 29 | 19 | Lodgepole Pine, Subalpine Conifer |
| | | PIAL 6 | 0.15 | 6,722 | 2 | 3 | Alpine Grasses and Forbs |
| | | PIAL 7 | 0.05 | 2,150 | 1 | 1 | Willow (Shrub) |
| | | PIAL 8 | 0.10 | 4,295 | 6 | 3 | Subalpine Conifer |
| | | PIAL 9 | 0.17 | 7,206 | 1 | 3 | Willow (Shrub) |
| *Pinus spp.* | Unknown five-needle pine | U5NP 1 | 0.03 | 1,331 | 0 | 2 | Subalpine Conifer |
| | | U5NP 2 | 0.04 | 1,821 | 0 | 1 | Barren |
| | | U5NP 3 | 0.05 | 2,333 | 0 | 4 | Subalpine Conifer |
| **Rush Creek Below Rush Meadows Dam** | | | | | | | |
| *Pinus albicaulis* | Whitebark pine | PIAL 10 | 0.11 | 4,666 | 12 | 9 | Willow (Shrub) |
| | | PIAL 11 | 0.03 | 1,317 | 2 | 5 | Willow (Shrub) |
| | | PIAL 12 | 1.89 | 82,219 | 20 | 180 | Lodgepole Pine |
| | | PIAL 13 | 0.20 | 8,802 | 3 | 5 | Lodgepole Pine, Willow (Shrub) |
| | | PIAL 14 | 0.01 | 402 | 1 | 0 | Lodgepole Pine |
| | | PIAL 15 | 0.21 | 9,296 | 4 | 3 | Lodgepole Pine, Willow (Shrub) |
| | | PIAL 16 | 0.04 | 1,877 | 2 | 0 | Subalpine Conifer |
| | | PIAL 17 | 0.20 | 8,724 | 1 | 8 | Lodgepole Pine, Willow (Shrub) |
| | | PIAL 18 | 0.35 | 15,175 | 13 | 12 | Lodgepole Pine, Willow (Shrub) |
| | | PIAL 19 | 0.02 | 884 | 2 | 1 | Lodgepole Pine, Subalpine Conifer |
| | | PIAL 20 | 0.04 | 1,525 | 1 | 3 | Lodgepole Pine |
| | | PIAL 21 | 0.33 | 14,272 | 6 | 7 | Lodgepole Pine |
| | | PIAL 22 | 0.14 | 5,924 | 3 | 2 | Lodgepole Pine |
| | | PIAL 23 | 0.02 | 893 | 1 | 0 | Lodgepole Pine |
| | | PIAL 24 | 1.09 | 47,497 | 6 | 15 | Lodgepole Pine |
| | | PIAL 25 | 0.02 | 808 | 1 | 2 | Lodgepole Pine |
| | | PIAL 26 | 0.19 | 8,161 | 10 | 40 | Lodgepole Pine |
| | | PIAL 27 | 0.64 | 28,078 | 12 | 45 | Lodgepole Pine, Subalpine Conifer |

| Scientific Name | Common Name | Population ID | Area | | Number of Individuals/Percent Cover | | Associated Vegetation Alliance |
|---|---|---|---|---|---|---|---|
| | | | Acres | Square Feet | Confirmed Whitebark Pines | Unknown Five-needle Pines[1] | |
| *Pinus spp.* | Unknown five-needle pine | U5NP 4 | 0.01 | 566 | 0 | 3 | Lodgepole Pine, Willow (Shrub) |
| | | U5NP 5 | 0.05 | 2,342 | 0 | 3 | Lodgepole Pine, Willow (Shrub) |
| | | U5NP 6 | 0.004 | 179 | 0 | 1 | Lodgepole Pine |
| | | U5NP 7 | 0.01 | 376 | 0 | 2 | Lodgepole Pine |
| | | U5NP 8 | 0.03 | 1,054 | 0 | 3 | Lodgepole Pine, Subalpine Conifer |
| **Gem Dam Area** | | | | | | | |
| *Pinus albicaulis* | Whitebark pine | PIAL 28 | 3.50 | 152,443 | 44 | 65 | Lodgepole Pine, Subalpine Conifer, Alpine Mixed Scrub |
| | | PIAL 29 | 2.17 | 94,313 | 5 | 7 | Subalpine Conifer |
| | | PIAL 30 | 7.13 | 310,555 | 132 | 216 | Subalpine Conifer, |
| | | PIAL 31 | 7.38 | 321,508 | 48 | 92 | Lodgepole Pine, Subalpine Conifer, Low Sagebrush, |
| | | PIAL 32 | 1.43 | 62,472 | 66 | 66 | Subalpine Conifer |
| | | PIAL 33 | 0.21 | 9,361 | 10 | 9 | Subalpine Conifer |
| | | PIAL 34 | 1.48 | 64,350 | 10 | 11 | Subalpine Conifer |
| | | PIAL 35 | 0.54 | 23,400 | 4 | 8 | Low Sagebrush, Curlleaf Mountain Mahogany |
| | | PIAL 36 | 1.32 | 57,345 | 54 | 56 | Subalpine Conifer |
| | | PIAL 37 | 1.04 | 45,130 | 9 | 18 | Subalpine Conifer |
| *Pinus spp.* | Unknown five-needle pine | U5NP 9 | 0.54 | 23,535 | 0 | 11 | Barren |
| | | U5NP 10 | 0.22 | 9,616 | 0 | 2 | Curlleaf Mountain Mahogany |
| **Agnew Dam Area** | | | | | | | |
| *Pinus albicaulis* | Whitebark pine | PIAL 38 | 0.86 | 37,277 | 3 | 19 | Lodgepole Pine |
| *Pinus spp.* | Unknown five-needle pine | U5NP 11 | 0.81 | 35,179 | 0 | 14 | Subalpine Conifer |
| **Total Trees in Study Area** | | | | | | | |
| *Pinus albicaulis* | Whitebark pine | – | 55.57 | 2,420,709 | 1,194 | | – |
| *Pinus spp.* | Unknown five-needle pine | – | 57.30 | 2,495,869 | 1,798 | | – |

[1] Five-needle pine trees missing conclusive features for identification (i.e., mature bark and cones) were classified as “unknown five-needle pines” consistent with INF guidance.

**Table 8.5-4 Non-Native Invasive Plant Populations within the FERC Project Boundary**

| Project Facility or Feature (Population ID)[1] | Scientific Name | Common Name | Treatment Strategy | Infestation Level[1] | Survey Date | Area | |
|---|---|---|---|---|---|---|---|
| | | | | | | Square Feet | Acres |
| **Rush Meadows Dam Area** | | | | | | | |
| Rush Meadows Dam | *Bromus tectorum* | Cheatgrass | 3 | Low | 8/10/2023 | 1 | <0.01 |
| **Gem Dam Area** | | | | | | | |
| Gem Boat Dock | *Bromus tectorum* | Cheatgrass | 3 | Low | 9/16/2023 | 746 | 0.02 |
| Gem Lake 1 | *Rumex crispus* | Curly dock | 4 | Low | 9/15/2023 | 108,967 | 2.50 |
| Gem Lake 2 | *Rumex crispus* | Curly dock | 4 | Low | 9/15/2023 | 553,635 | 12.71 |
| Gem Lake 3 | *Rumex crispus* | Curly dock | 4 | Low | 9/15/2023 | 35,285 | 0.81 |
| Gem Dam to Agnew Junction Penstock 1 | *Bromus tectorum* | Cheatgrass | 3 | Low | 7/20/2023 | 23,705 | 0.54 |
| Gem Dam to Agnew Junction Penstock 1 | *Verbascum thapsus* | Common Mullein | 4 | Low | 7/20/2023 | 12 | <0.01 |
| Gem Dam to Agnew Junction Penstock 1 | *Bromus tectorum* | Cheatgrass | 3 | Low | 7/20/2023 | 18,049 | 0.41 |
| Gem Dam to Agnew Junction Penstock 1 | *Bromus tectorum* | Cheatgrass | 3 | Low | 7/20/2023 | 17,499 | 0.40 |
| Gem Dam to Agnew Junction Penstock 1 | *Bromus tectorum* | Cheatgrass | 3 | Low | 7/20/2023 | 24,635 | 0.57 |
| Gem Dam to Agnew Junction Penstock 1 | *Bromus tectorum* | Cheatgrass | 3 | Low | 7/20/2023 | 8,551 | 0.20 |
| **Agnew Dam Area** | | | | | | | |
| Agnew Lake 1 | *Cirsium vulgare* | Bull thistle | 3 | Low | 9/10/2023 | 303,474 | 6.97 |
| | *Rumex crispus* | Curly dock | 4 | Low | 9/10/2023 | | |
| | *Verbascum thapsus* | Common mullein | 4 | Moderate | 9/10/2023 | | |
| Agnew Lake 2 | *Rumex crispus* | Curly dock | 4 | Low | 9/10/2023 | 107,676 | 2.47 |
| | *Bromus tectorum* | Cheatgrass | 3 | Low | 9/10/2023 | | |
| Agnew Lake 3 | *Rumex crispus* | Curly dock | 4 | Low | 9/10/2023 | 34,488 | 0.79 |
| | *Verbascum thapsus* | Common mullein | 4 | Moderate | 9/10/2023 | | |
| Agnew Lake 4 | *Bromus tectorum* | Cheatgrass | 3 | Moderate | 9/10/2023 | 33,370 | 0.77 |
| Agnew Lake 5 | *Verbascum thapsus* | Common mullein | 4 | Low | 9/10/2023 | 44,530 | 1.02 |
| | *Bromus tectorum* | Cheatgrass | 3 | Low | 9/10/2023 | | |
| Agnew Dam | *Verbascum thapsus* | Common mullein | 4 | Moderate | 7/20/2023; 9/10/2023 | 181,219 | 4.16 |
| | *Rumex crispus* | Curly dock | 4 | Low | 9/10/2023 | | |
| | *Bromus tectorum* | Cheatgrass | 3 | Low | 9/10/2023 | | |
| Agnew Tram 1 | *Bromus tectorum* | Cheatgrass | 3 | Moderate | 7/19/2023; 7/20/2023; 9/9/2023; 9/10/2023 | 108,654 | 2.49 |
| Agnew Tram 2 | *Bromus tectorum* | Cheatgrass | 3 | Low | 9/9/2023 | 854 | 0.02 |

| Project Facility or Feature (Population ID)[1] | Scientific Name | Common Name | Treatment Strategy | Infestation Level[1] | Survey Date | Area | |
|---|---|---|---|---|---|---|---|
| | | | | | | Square Feet | Acres |
| Agnew Tram 3 | *Bromus tectorum* | Cheatgrass | 3 | Low | 7/19/2023 | 10,567 | 0.24 |
| | *Taraxacum officinale* | Common dandelion | 4 | Moderate | 7/19/2023; 9/9/2023 | | |
| | *Verbascum thapsus* | Common Mullein | 4 | Moderate | 7/19/2023; 9/9/2023 | | |
| Agnew Tram 4 | *Bromus tectorum* | Cheatgrass | 3 | Low | 7/19/2023 | 21,846 | 0.50 |
| Agnew Tram 5 | *Bromus tectorum* | Cheatgrass | 3 | Low | 7/19/2023 | 28,733 | 0.66 |
| Agnew Tram 6 | *Bromus tectorum* | Cheatgrass | 3 | Moderate | 7/18/2023; 9/9/2023 | 10,777 | 0.25 |
| | *Cirsium vulgare* | Bull thistle | 3 | Low | 7/18/2023 | | |
| | *Melilotus albus* | White sweetclover | 3 | Moderate | 9/9/2023 | | |
| | *Verbascum thapsus* | Common mullein | 4 | Low | 9/9/2023 | | |
| Agnew Tram 7 | *Bromus tectorum* | Cheatgrass | 3 | High | 9/8/2023 | 4 | <0.01 |
| Agnew Tram 8[3] | Unknown Melilotus spp | No species ID | 3 | Low | 9/9/2023 | 1 | <0.01 |
| Agnew Tram 9 | *Bromus tectorum* | Cheatgrass | 3 | Low | 9/9/2023 | 4 | <0.01 |
| Powerline to Agnew Dam 1 | *Bromus tectorum* | Cheatgrass | 3 | Low | 9/9/2023 | 16 | <0.01 |
| Powerline to Agnew Dam 2 | *Bromus tectorum* | Cheatgrass | 3 | Low | 7/19/2023 | 36,750 | 0.84 |
| Powerline to Agnew Dam 3 | *Bromus tectorum* | Cheatgrass | 3 | Moderate | 9/8/2023 | 561 | 0.01 |
| Powerline to Agnew Dam 4 | *Bromus tectorum* | Cheatgrass | 3 | Low | 7/18/2023 | 6,290 | 0.14 |
| **Rush Creek Powerhouse Area** | | | | | | | |
| Rush Creek Powerhouse 1 | *Bromus tectorum* | Cheatgrass | 3 | Moderate | 9/9/2023 | 12266 | 0.28 |
| Rush Creek Powerhouse 2 | *Tragopogon dubius* | Yellow salsify | 4 | Low | 7/18/2023 | 10 | <0.01 |
| Rush Creek Powerhouse 3 | *Bromus tectorum* | Cheatgrass | 3 | Low | 9/8/2023 | 1 | <0.01 |
| Rush Creek Powerhouse 4 | *Bromus tectorum* | Cheatgrass | 3 | Moderate | 9/8/2023 | 10 | 0.16 |
| Rush Creek Powerhouse 5 | *Bromus tectorum* | Cheatgrass | 3 | Low | 7/18/2023 | 99 | <0.01 |
| Rush Creek Powerhouse 6 | *Bromus tectorum* | Cheatgrass | 3 | Moderate | 9/8/2023 | 4 | <0.01 |
| Rush Creek Powerhouse 7 | *Bromus tectorum* | Cheatgrass | 3 | Low | 7/18/2023 | 30 | 0.16 |
| Rush Creek Powerhouse 8 | *Bromus tectorum* | Cheatgrass | 3 | Low | 9/8/2023 | 4 | <0.01 |
| Rush Creek Powerhouse 9 | *Bromus tectorum* | Cheatgrass | 3 | Low | 9/9/2023 | 4 | <0.01 |
| Rush Creek Powerhouse 10 | *Bromus tectorum* | Cheatgrass | 3 | Low | 9/9/2023 | 9 | <0.01 |
| Rush Creek Powerhouse 11 | *Bromus tectorum* | Cheatgrass | 3 | Low | 9/8/2023 | 10 | <0.01 |
| Rush Creek Powerhouse 12 | *Bromus tectorum* | Cheatgrass | 3 | Low | 9/9/2023 | 7064 | 0.16 |
| Switchyard 1 | *Bromus tectorum* | Cheatgrass | 3 | Low | 7/18/2023 | 601 | 0.01 |
| | *Spergularia rubra* | Red sandspurry | 4 | Low | 7/18/2023 | | |
| | *Trifolium repens* | White clover | 4 | Low | 7/18/2023 | | |

| Project Facility or Feature (Population ID)[1] | Scientific Name | Common Name | Treatment Strategy | Infestation Level[1] | Survey Date | Area | |
|---|---|---|---|---|---|---|---|
| | | | | | | Square Feet | Acres |
| Switchyard 2 | *Bromus tectorum* | Cheatgrass | 3 | Low | 7/18/2023 | 14,206 | 0.33 |
| | *Melilotus albus* | White sweetclover | 3 | Low | 9/8/2023 | | |
| | *Verbascum thapsus* | Common mullein | 4 | Low | 9/8/2023 | | |
| Garage and Pump House | *Bromus tectorum* | Cheatgrass | 3 | Low | 9/7/2023 | 11,685 | 0.27 |
| | *Melilotus albus* | White sweetclover | 3 | Low | 7/18/2023 | | |
| | *Rumex crispus* | Curly dock | 4 | Low | 7/17/2023 | | |
| | *Taraxacum officinale* | Common dandelion | 4 | Low | 7/18/2023 | | |
| | *Tragopogon dubius* | Yellow salsify | 4 | Low | 9/7/2023 | | |
| | *Verbascum thapsus* | Common mullein | 4 | Low | 9/7/2023 | | |
| | *Trifolium repens* | White clover | 4 | Low | 7/17/2023 | | |
| Warehouse and Dock | *Bromus tectorum* | Cheatgrass | 3 | Low | 7/18/2023 | 6,322 | 0.15 |
| Machine Shop | *Bromus tectorum* | Cheatgrass | 3 | Low | 9/7/2023 | 3,292 | 0.08 |
| | *Melilotus albus* | White sweetclover | 3 | Moderate | 9/7/2023; 9/8/2023 | | |
| | *Taraxacum officinale* | Common dandelion | 4 | Moderate | 7/17/2023; 9/8/2023 | | |
| | *Tragopogon dubius* | Yellow salsify | 4 | Moderate | 9/7/2023 | | |
| | *Verbascum thapsus* | Common mullein | 4 | Moderate | 9/7/2023; 9/8/2023 | | |
| HWY 158 | *Taraxacum officinale* | Common dandelion | 4 | Low | 7/17/2023 | 17,532 | 0.40 |
| | *Tragopogon dubius* | Yellow salsify | 4 | Low | 7/17/2023 | | |
| | *Verbascum thapsus* | Common mullein | 4 | Low | 7/17/2023 | | |
| Cottage and Woodshed | *Bromus tectorum* | Cheatgrass | 3 | Low | 7/18/2023; 9/8/2023 | 27,226 | 0.63 |
| | *Cirsium vulgare* | Bull thistle | 3 | Low | | | |
| | *Saponaria officinalis* | Soapwort | 2 | Moderate | 9/8/2023 | | |
| | *Taraxacum officinale* | Common dandelion | 4 | Low | 9/8/2023 | | |
| | *Tragopogon dubius* | Yellow salsify | 4 | Low | 7/18/2023 | | |
| | *Trifolium repens* | White clover | 4 | Low | 7/18/2023 | | |
| | *Verbascum thapsus* | Common mullein | 4 | Low | 7/18/2023 | | |
| Access Road | *Bromus tectorum* | Cheatgrass | 3 | Low | 7/18/2023 | 5,786 | 0.13 |
| | *Melilotus albus* | White sweetclover | 3 | Low | 7/18/2023 | | |
| | *Taraxacum officinale* | Common dandelion | 4 | Low | 7/18/2023 | | |
| | *Verbascum thapsus* | Common mullein | 4 | Low | 7/18/2023 | | |
| | *Trifolium repens* | White clover | 4 | Low | 7/18/2023 | | |
| Bridge | *Taraxacum officinale* | Common dandelion | 4 | Low | 9/8/2023 | 22,914 | 0.53 |
| | *Verbascum thapsus* | Common mullein | 4 | Low | 9/8/2023 | | |

| Project Facility or Feature (Population ID)[1] | Scientific Name | Common Name | Treatment Strategy | Infestation Level[1] | Survey Date | Area | |
|---|---|---|---|---|---|---|---|
| | | | | | | Square Feet | Acres |
| Rush Creek and South Rush Creek channel upstream and downstream of State Route 158 crossing | *Bromus tectorum* | Cheatgrass | 3 | Low | 7/17/2023 | 6,982 | 0.16 |
| | *Cirsium vulgare* | Bull thistle | 3 | Low | 9/7/2023 | | |
| | *Polygonum aviculare* | Prostrate knotweed | 4 | Moderate | 9/7/2023 | | |
| | *Salsola tragus* | Russian thistle | 3 | High | 9/7/2023 | | |
| | *Spergularia rubra* | Red sandspurry | 4 | Moderate | 9/7/2023 | | |
| | *Tragopogon dubius* | Yellow salsify | 4 | Low | 7/17/2023 | | |
| | *Verbascum thapsus* | Common mullein | 4 | Low | 9/7/2023 | | |
| South Rush Creek Cottage | *Bromus tectorum* | Cheatgrass | 3 | Moderate | 9/8/2023 | 135,842 | 3.12 |
| | *Cirsium vulgare* | Bull thistle | 3 | Low | 9/7/2023 | | |
| | *Centaurea stoebe* | Spotted knapweed | 1 | Low | 9/9/2023 | | |
| | *Rumex crispus* | Curly dock | 4 | Low | 9/7/2023 | | |
| | *Polygonum aviculare* | Prostrate knotweed | 4 | Low | 9/8/2023 | | |
| | *Tragopogon dubius* | Yellow salsify | 4 | Moderate | 9/8/2023 | | |
| | *Verbascum thapsus* | Common mullein | 4 | Moderate | 9/7/2023; 9/8/2023; 9/9/2023 | | |

[1] **Inyo NF Treatment Strategies**

| | | |
|---|---|---|
| 1 | Eradicate: | Annually treat and monitor the infestation with the goal of complete elimination of the species. |
| 2 | Control: | Treat and monitor a portion of the infestations each year, focusing on reducing the acreage and percent cover over time. |
| 3 | Contain: | Treat leading edge or new satellite infestations, or where concurrent with high-value resources. |
| 4 | Limited/No Treatment: | Limited to site-specific restoration projects or no treatment efforts at this time. |

**Table 8.5-5. Special-Status Terrestrial Wildlife Species Known or Potentially Occurring within the FERC Project Boundary**

| Scientific/Common Name | Federal Status | Forest Service Status | State Status | Habitat | Likelihood for Occurrence |
|---|---|---|---|---|---|
| **Known to Occur or Critical Habitat is Present in the FERC Project Boundary** | | | | | |
| *Danaus plexippus*<br>Monarch butterfly | FC | — | — | Overwintering populations occur in coastal California. In late-February or March, monarchs will disperse from wintering areas to interior California. Breeding occurs on milkweed (*Asclepias* spp.) which occur in short and tall grass prairies, livestock pastures, agricultural margins, roadsides, wetland and riparian areas, sandy areas, gardens, open forests, and woodlands. | **Known to occur within the FERC Project boundary.**<br>Observed migrating near Waugh Lake and Gem Lake during technical studies implemented in 2023. No milkweeds were observed in the Project area during TERR 1 technical studies, so the Project area does not contain suitable breeding habitat for this species. Flowering plants in the Project area provide suitable foraging habitat for the species during their migration to wintering habitat on the coast. |
| *Rana sierrae*<br>Sierra Nevada yellow-legged frog | FE | — | ST | Streams, lakes, and ponds in montane riparian, lodgepole pine, subalpine conifer, and wet meadow habitats. Breeds in shallow water in low gradient perennial streams and lakes. Known at elevations ranging from 4,500 to 12,000 feet. | **Critical Habitat is present in the FERC Project Boundary.** Critical Habitat Unit 3/Subunit 3E (Evolution/Leconte) (USFWS 2016) encompasses Waugh Lake and Gem Lake (and Rush Creek between the two lakes). Refer to Map 8.5-6 for the location of the Critical Habitat.<br>The CNDDB query yielded four records within 1 mile of the FERC Project boundary:<br>• A 1993 record approximately 0.5 mile east of the Rush Creek Powerhouse in the Reversed Peak Study Area. Revisited in 2003 but no individuals were found.<br>• A 2010 record approximately 1 mile west of the western point of Waugh Lake in a tributary stream. Several adult SNYLF and tadpoles were also observed at this location in 2023 by REC-1 survey crews.<br>• A 2010 record approximately 0.25 mile south of Waugh Lake in a tributary stream.<br>• A 2013 record approximately 1 mile south of Waugh Lake in a tributary stream and associated alpine lakes.<br>The NRIS query yielded 98 records within 1 mile of the FERC Project boundary between 2000 and 2010 (Forest Service 2017b). These records are located in the same general vicinity as the CNDDB records.<br>There are five known breeding populations within 1 mile of the FERC Project boundary (CDFW 2016). |
| *Anaxyrus canorus*<br>Yosemite toad | FT8.5,<br>Table 8.5.6 | — | CSC | Montane meadows and forest borders; breeds in shallow pools, at lake margins, or in pools of quiet streams at elevations ranging from 6,400 to 11,300 feet. | **Critical Habitat is present in the FERC Project boundary.** Critical Habitat Unit 5 (Tuolumne Meadows/Cathedral) (USFWS 2016) encompasses Waugh Lake and Rush Creek downstream of Rush Meadows Dam. Refer to Map 8.5-6 for the location of the Critical Habitat.<br>The NRIS query yielded three records within 1 mile of the FERC Project boundary:<br>• A 2002 record from adjacent to a tributary stream upstream of the western Waugh Lake.<br>• Two 2003 records approximately 1 mile south of Waugh Lake within a large meadow system.<br>There are no known breeding populations within 1 mile of the FERC Project boundary (CDFW 2016). |
| *Aquila chrysaetos*<br>golden eagle | Eagle Act | — | CFP (nesting and wintering) | Grasslands and early successional stages of forest and shrub habitats for foraging at elevations up to 11,500 feet. Secluded cliffs with overhanging ledges or large trees in open areas with unobstructed view for nesting. | **Known to Occur within the FERC Project boundary.**<br>Observations of golden eagles in the vicinity of Silver Lake were reported by agencies and members of the TERR 2 Technical Working Group (Linda Coffin, pers. comm).<br>In addition, USFWS reported nests in the vicinity of Mono Craters and Bald Mountain (USFWS 2023). All nest occurrences are more than 4 miles from the study area. |

| Scientific/Common Name | Federal Status | Forest Service Status | State Status | Habitat | Likelihood for Occurrence |
|---|---|---|---|---|---|
| *Haliaeetus leucocephalus*<br>bald eagle | Eagle Act | FSCC | SE, CFP | Year-round resident in ice-free regions of California. Foraging areas include regulated and unregulated rivers, reservoirs, lakes, estuaries, and coastal marine ecosystems. Majority of bald eagles in California breed near reservoirs and nests are usually located within 1 mile of foraging habitat. Nests are typically placed in the branches of large conifer trees within dense stands of trees (Jackman and Jenkins 2004). | **Known to occur within the FERC Project boundary**.<br>• Observed flying over the Agnew Lake dam during monitoring conducted in the Project vicinity (Phase I) (SCE 2017).<br>• A subadult was observed flying over Waugh Lake during pre-construction surveys conducted at Rush Meadows Dam (Phase II) (SCE 2018).<br>During technical studies conducted in 2023:<br>• One adult was observed perched in a large Jeffrey pine (*Pinus jeffreyi*) on the southern end of Silver Lake on multiple dates;<br>• One sub-adult was observed on a large pine (*Pinus* spp.) south of Rush Creek, near Gem Lake;<br>• One adult was observed gliding along the northern ridge of Gem Dam.<br>• One adult was observed perched in a pine along the southern shoreline of Gem Lake.<br>• One sub-adult was observed flying over Waugh Lake.<br>One adult bald eagle was observed chasing an osprey on the north shoreline of Gem Lake. |
| *Selasphorus calliope*<br>Calliope hummingbird | BCC | — | — | Prefers coniferous forests and mountain meadow habitats for breeding. In the Sierra Nevada, it typically nests above 4,000 feet elevation. Typically nests in lodgepole pine or aspen, immediately beneath live branches, and typically in riparian areas. Migrates and spend winter in central and southern Mexico. | **Known to Occur within the FERC Project boundary.**<br>One individual was observed in willow habitats along Rush Creek above Silver Lake during technical studies implemented in 2023. |
| *Setophaga petechia*<br>yellow warbler | — | — | SSC (nesting) | Usually arrives in California in April, and migrates by October. Breeds in riparian woodlands from coastal and desert lowlands at elevations up to 8,000 feet in the Sierra Nevada. Also breeds in montane chaparral, open ponderosa pine, and mixed conifer habitats with substantial amounts of brush. | **Known to occur within the FERC Project boundary.**<br>During technical studies completed in 2023:<br>• An adult male was heard singing in willows (*Salix* spp.) south of Silver Lake and later detected by sight.<br>• Four individuals were observed in the vicinity of Silver Lake.<br>Two individuals were observed along Rush Creek downstream of Silver Lake. |
| *Haemorhous cassinii*<br>Cassin's finch | BCC | — | — | A common montane resident from 4,200 to 8,000 feet in elevation. Prefers tall, open coniferous forests, in lodgepole pine, red fir, and subalpine conifer habitats, especially for breeding. Most numerous near wet meadows and grassy openings; also frequents semiarid forests. | **Known to occur in the FERC Project boundary.**<br>During technical studies completed in 2023 :<br>• A male and a female were observed foraging along the edge of a grassland in the Rush Creek Powerhouse area;<br>• An adult male was observed in a lodgepole pine (*Pinus contorta*) forest near the Frontier Pack Station (east of Rush Meadows Dam).<br>• Six individuals were observed near Rush Creek west of Waugh Lake.<br>An adult male was observed along Rush Creek below Agnew Dam. |

| Scientific/Common Name | Federal Status | Forest Service Status | State Status | Habitat | Likelihood for Occurrence |
|---|---|---|---|---|---|
| **May Potentially Occur in the FERC Project Boundary or within 1 Mile of the Boundary** | | | | | |
| *Colias behrii*<br>Sierra sulphur butterfly | — | FSCC | — | Endemic to the Sierra Nevada from Tuolumne County south to Tulare County. Found in alpine and subalpine meadows above 9,000 feet. Found in association with *Vaccinium* sp. and *Gentiana newberryi* host plants (Forest Service 2018). | May potentially occur in appropriate habitat. |
| *Euphydryas editha monoensis*<br>Mono Lake checkerspot butterfly | — | FSCC | — | The Mono checkerspot occurs on the east side of the Sierra Nevada in meadows and conifer forests, and Mono County is the center of its distribution (Forest Service 2018). | May potentially occur in appropriate habitat. |
| *Speyeria nokomis apacheana*<br>apache fritillary butterfly | — | FSCC | — | Moist meadows, seeps, marshes, and streams in the eastern Sierra Nevada. Specific to the host plant *Viola nephropylla,* and is threatened by encroachment of non-native species such as *Cirsium vulgare* into meadow habitats (Forest Service 2018). | May potentially occur in appropriate habitat. |
| *Accipiter gentilis*<br>northern goshawk | — | — | CSC (nesting) | Middle to high elevation, mature, dense conifer forests for foraging and nesting. Casual in foothills during winter, northern deserts in pinyon-juniper woodland, and low elevation riparian habitats. | May potentially occur in appropriate habitat. |
| *Falco peregrinus anatum*<br>American peregrine falcon | BCC | — | — | Very uncommon breeding resident and uncommon as a migrant. Breeds in woodlands, forests, coastal habitats, and riparian areas near wetlands, lakes, rivers, or other water on high cliffs, banks, dunes, or mounds. Active nesting sites are known along the coast, in the Sierra Nevada, and in the mountains of northern California. Migrants occur along the coast and the western Sierra Nevada in spring and fall. | May potentially occur in appropriate habitat. |
| *Asio flammeus*<br>short-eared owl | BCC | — | CSC (nesting) | Open areas with few trees, such as annual and perennial grasslands, prairies, dunes, meadows, irrigated lands, saline and fresh emergent wetlands. Needs elevated sites for perching and dense vegetation for roosting. | May potentially occur in appropriate habitat. |
| *Asio otus*<br>long-eared owl | BCC | — | CSC (nesting) | Found in dense riparian habitat or other thickets in foothills and mountains with small, densely canopied trees for roosting and nesting. More common in Great Basin regions of California. | May potentially occur in appropriate habitat. |
| *Psiloscops flammeolus*<br>flammulated owl | BCC | — | — | Summer resident in coniferous habitats from ponderosa pine to red fir forests from 6,000 to 10,000 feet in elevation; prefers low to intermediate canopy closure. Breeds in the North Coast and Klamath Ranges, Sierra Nevada, and in suitable habitats in mountains in southern California. | May potentially occur in appropriate habitat. |
| *Cypseloides niger*<br>black swift | BCC | — | CSC (nesting) | Nests in moist crevices or caves, or on cliffs near waterfalls in deep canyons at elevations ranging from 6,000 to 11,000 feet. Forages widely over many habitats; seems to avoid arid regions. Known from the high elevations of the Sierra National Forest. | May potentially occur in appropriate habitat. |
| *Melanerpes lewis*<br>Lewis's woodpecker | BCC | — | — | Breeds east of the Sierra Nevada crest in a cavity excavated in sycamore, cottonwood, oak, or conifer trees. Winter resident in open oak savannas, broken deciduous and coniferous habitats with sufficient supply of acorns and insects. | May potentially occur in appropriate habitat. |

| Scientific/Common Name | Federal Status | Forest Service Status | State Status | Habitat | Likelihood for Occurrence |
|---|---|---|---|---|---|
| *Empidonax traillii brewsteri*<br>little willow flycatcher | — | FSCC | SE | Summer resident in wet meadow and montane riparian habitats at 2,000 to 8,000 feet in the Sierra Nevada. Most often occurs in broad, open river valleys or large mountain meadows with lush growth of shrubby willows. Requires meadows at least 1 acre in size for breeding, prefers meadows larger than 10 acres (Green et al. 2003). | May potentially occur in appropriate habitat.<br>The CNDDB query yielded one record outside the study area, but within 1 mile of the boundary:<br>• One territorial male was observed singing in June 1982 about 0.5 mile east of the Rush Creek Powerhouse. Point counts conducted in this area between 1998–2003 did not detect any individuals.<br>The NRIS query yielded two records within 1 mile of the boundary.<br>• One male was observed in June 1982 across Highway 158 in a meadow near the Rush Creek Powerhouse.<br>Another male was observed in June 1982 approximately 1 mile northeast of the Rush Creek Powerhouse. |
| *Contopus cooperi*<br>olive-sided flycatcher | BCC | — | CSC | Uncommon to common, summer resident in a wide variety of forest and woodland habitats. Nesting habitats include mixed conifer, montane hardwood-conifer, Douglas-fir, redwood, red fir, and lodgepole pine forests from 3,000 to 9,000 feet in elevation. | May potentially occur in appropriate habitat. |
| *Sorex lyelli*<br>Mt. Lyell shrew | — | — | CSC | Riparian habitats within high montane and cold steppe communities of the eastern slopes of the Sierra Nevada in the vicinity of Yosemite National Park. Uses logs, stumps, and other surface objects for cover. | May potentially occur in appropriate habitat. |
| *Antrozous pallidus*<br>Pallid bat | — | — | CSC | Grasslands, shrublands, woodlands, and forests from sea level to 10,000 feet in elevation. Typically, day-roosts in caves, crevices, or mines. Night roosts are in more open areas. Requires open habitat for foraging. Pallid bat hibernates in winter. Maternal colonies form in April. | May potentially occur in appropriate habitat. |
| *Corynorhinus townsendii*<br>Townsend's big-eared bat | — | — | CSC | Found in all but alpine and subalpine habitats; most abundant in mesic habitats up to 6,000 feet in elevation. Requires caves, mines, tunnels, buildings, or other man-made structures for roosting. Hibernates October through April. Locally migratory only. Extremely sensitive to disturbance and may abandon a roost if disturbed. The Inyo National Forest is known to provide hibernacula, but likely does not support maternity roosts because of its high elevation (Forest Service 2018). | May potentially occur in appropriate habitat. |
| *Euderma maculatum*<br>Spotted bat | — | — | CSC | Ranges from arid deserts and grasslands through mixed conifer forests up to elevations of 10,600 feet in southern California. Prefers sites with adequate roosting habitat, such as cliffs. Often limited by the availability of cliff habitat. Feeds over water and along marshes. Capable of torpor and may hibernate. May make seasonal movements from high elevations in summer to lower elevations in autumn. | May potentially occur in appropriate habitat. |

| Scientific/Common Name | Federal Status | Forest Service Status | State Status | Habitat | Likelihood for Occurrence |
|---|---|---|---|---|---|
| *Ovis canadensis sierrae*<br>Sierra Nevada bighorn sheep | FE | — | SE, CFP | Lives on steep, rugged slopes in the eastern Sierra Nevada in shrub, grassland, montane chaparral, subalpine conifer, or riparian habitats. | May potentially migrate through the study area.<br>**Critical habitat is present outside the study area, but within 1 mile of the FERC Project boundary.**<br>Critical Habitat Unit 2 (Mount Gibbs) is present within 1 mile of the FERC Project boundary but does not overlap the boundary (USFWS 2008b). Refer to Map 8.5-6 for the location of the Critical Habitat.<br>In addition, the Cathedral Range Herd Unit (CDFW 2015), is located approximately 1.2 mile east of the FERC Project boundary.<br>There are no known occurrences of this species in the FERC Project boundary or within 1 mile of the boundary. Collared individuals of the Mt. Gibbs herd commonly spend most of the year in alpine habitats and make seasonal movements between Mt. Gibbs and Mt. Lewis, approximately 10 miles north of the Project area (CDFW 2021). However, movements have been recorded between the Mount Gibbs herd and the Central recovery unit south of the Project area, and between the Mt. Gibbs herd unit and the Cathedral Range Herd Unit to the east of the Project area (CDFW 2018b). Therefore, there is some potential that individuals may migrate or disperse through the Project (USFWS 2007). |
| *Lepus americanus tahoensis*<br>Sierra Nevada snowshoe hare | — | — | CSC | Found at upper elevations in the Cascades and Sierra Nevada. Found primarily in montane riparian habitats with thickets of alder and willow, in stands of young conifers interspersed with chaparral, and on edges of meadows. | May potentially occur in appropriate habitat. |
| *Lepus townsendii townsendii*<br>Western white-tailed jackrabbit | — | — | CSC | Open areas with scattered shrubs in sagebrush, subalpine conifer, juniper, alpine dwarf-shrub, and perennial grassland habitats in the high eastern Sierra. Also uses low sagebrush, wet meadow, and early successional stages of various conifer habitats. Moves seasonally to lower elevations in the winter. | May potentially occur in appropriate habitat. |
| *Aplodontia rufa californica*<br>Sierra Nevada mountain beaver | — | — | CSC | Dense riparian and open brushy stages of most forest types at elevations ranging from 3,900 to 10,100 feet in elevation. Deep, friable soils are required for burrowing along cool, moist microclimates. Line in burrows located in or near deep soils near streams and springs. Typical habitat in the Sierra is montane riparian. | May potentially occur in appropriate habitat. |
| *Vulpes vulpes necator*<br>Sierra Nevada red fox (Sierra Nevada Distinct Population Segment [DPS]) | FE | — | ST | The current range of the Sierra Nevada DPS of the Sierra Nevada red fox runs southeast along the Sierra crest from just south of Highway 88 to a few miles north of Kings Canyon National Park (USFWS 2021). Inhabits sub-alpine and high-elevation conifer areas including high-elevation meadows, rocky areas, scrub vegetation and open whitebark pine and lodgepole pine forest. Typically found between 8,100 and 11,600 feet in elevation.<br>USFWS has not proposed to designate Critical Habitat for this species. | May potentially occur in appropriate habitat.<br>Sierra Nevada red foxes have been detected on CDFW's Alpine Mesocarnivore survey grids in the vicinity of the Rush Creek Project between 2019 and 2023. The nearest observations are two 2019 camera trap observations southwest of Waugh Lake near Rogers Lake and Marie Pass (Hatfield et al. 2021, 2023; Julia Lawson, pers. comm.) |
| *Gulo gulo luscus*<br>North American wolverine – Contiguous U.S. DPS | FT | — | ST, CFP | No breeding populations have been identified in California (USFWS 2023b). Wolverines require large territories in inaccessible landscapes at high elevation, access to seasonally varied food resources, physical/structural features (e.g., talus slopes, rugged terrain) for breeding, and habitats characterized by the presence of persistent spring snow (of greater than or equal to 1 meter on May 1). Occurs in Sierra Nevada at elevations ranging from 4,300 to 10,800 feet. Majority of recorded sightings are found above 8,000 feet in elevation.<br>USFWS has not proposed to designate Critical Habitat for this species. | May potentially occur in appropriate habitat.<br>Multiple sightings of a wolverine on the Inyo National Forest in Mono and Inyo counties were confirmed by CDFW in 2023 (CDFW 2023c). Another sighting was confirmed in Yosemite National Park in Tuolumne County (CDFW 2023c). The nearest known detection of wolverine was from the north shore of Thousand Islands Lakes, just south of the Project area (Julia Lawson, pers. comm.). |

| Scientific/Common Name | Federal Status | Forest Service Status | State Status | Habitat | Likelihood for Occurrence |
|---|---|---|---|---|---|
| *Martes caurina sierrae*<br>Sierra marten | — | FSCC | — | Martens are known from the high elevation forested plant communities. Optimal habitats are various mixed evergreen forests with more than 40% crown closure and large trees and snags for den sites. Most commonly found in red fir and lodgepole pine forests between 4,000 and 10,600 feet elevation. | May potentially occur in appropriate habitat. |
| *Taxidea taxus*<br>American badger | — | — | CSC | Occurs throughout most of the state in areas with dry, friable soils. It is most abundant in drier open stages of most shrub, forest, and herbaceous habitats up to 12,000 feet in elevation. | May potentially occur in appropriate habitat. |
| *Bassariscus astutus*<br>ringtail | — | — | CFP | Found in most forest and shrub habitats in close association with rock and/or riparian areas, usually not more than 0.6 mile from water. Dens in hollow trees, snags, or other cavities. Found from seal level up to 8,800 feet. | May potentially occur in appropriate habitat. |
| **Unlikely to Occur in the FERC Project Boundary or within 1 Mile of the Boundary** | | | | | |
| *Euphilotes battoides mazourka*<br>square dotted blue | — | FSCC | — | Only known from badger flat adjacent to Mazourka peak from about 8,000 to 13,000 feet in elevation. | Unlikely to occur.<br>The study area is outside the geographic range of this species. |
| *Plebejus icarioides inyo*<br>Boisduval's blue | — | FSCC | — | Restricted to the Inyo Mountains around elevations of 9,000 feet. | Unlikely to occur.<br>The study area is outside the geographic range of this species. |
| *Plebulina emigdionis*<br>San Emigdio blue | — | FSCC | — | Found in southern California as far north as Inyo County, in desert shrubland and chaparral habitats and dry river courses and intermittent stream sides as well as adjacent flats. | Unlikely to occur.<br>The study area is within Mono County, which is outside of the geographical range of this species. |
| *Tuberochernes aalbui*<br>a cave obligate pseudoscorpion | — | FSCC | — | Only known from one location in Poleta Cave in the Inyo-White Mountains in Inyo County, California (Forest Service 2018b). | Unlikely to occur.<br>The study area is outside the geographic range of this species. |
| *Actinemys marmorata*<br>northwestern pond turtle | FPT | — | SSC | Found in perennial wetlands and slow-moving creeks and ponds with overhanging vegetation up to 6,500 feet in elevation in the Sierra Nevada (USFWS 2023d). It prefers suitable basking sites, such as logs and rocks, above the waterline. | Unlikely to occur.<br>The study area is outside the elevation range of this species. |
| *Batrachoseps campi*<br>Inyo Mountain slender salamander | — | FSCC | CSC | This species' distribution is limited to the west and east slopes of the Inyo Mountains. Only known from 15 locations in the Inyo Mountains. Inhabits very dry mountain ranges typically in the immediate vicinity of springs, seeps, and their associated riparian growth where there is a small area of suitable habitat surrounded by inhospitable desert terrain. They are found in damp soil under rocks or in humid crevices, not in open water. Found at elevations from 1,800 to 8,600 feet (Calherps 2020). | Unlikely to occur.<br>The study area is outside the geographic range of this species. |
| *Batrachopseps robsutus*<br>Kern Plateau slender salamander | — | FSCC | — | The distribution of this species is limited to the Kern Plateau of the southeastern Sierra in Kern County from 5,580 to 9,2000 feet in elevation and also in the Scodie mountains (Calherps 2020). | Unlikely to occur.<br>The study area is outside the geographic range of this species. |
| *Anaxyrus exsul*<br>black toad | — | FSCC | CT, CPF | The distribution of this species is limited to the Deep Springs Valley between the White and Inyo Mountains in Inyo County CA at elevations ranging from 4,900 to 5,600 feet (Calherps 2020). | Unlikely to occur.<br>The study area is outside the geographic range of this species. |
| *Buteo swainsoni*<br>Swainson's hawk | BCC | — | CT (nesting) | Uncommon breeding resident and migrant in the Central Valley, Klamath Basin, Northeastern Plateau, Lassen County, and Mojave Desert. Riparian woodlands, juniper-sage flats, and oak woodlands for nesting. Grasslands and agricultural areas for foraging. | Unlikely to occur.<br>The Project does not contain suitable habitat for this species. |

| Scientific/Common Name | Federal Status | Forest Service Status | State Status | Habitat | Likelihood for Occurrence |
|---|---|---|---|---|---|
| *Circus cyaneus*<br>northern harrier | — | — | CSC (nesting) | Occurs in a variety of habitats at elevations up to 10,000 feet. Forages in open areas such as meadows, wetlands, and grasslands. Breeding habitat is up to 5,700 feet in the Sierra Nevada, in areas with shrubby vegetation near foraging habitat. | Unlikely to occur.<br>The study area is outside the breeding (nesting) elevation range of this species. |
| *Centrocercus urophasianus*<br>greater sage-grouse - Bi-State DPS | — | — | CSC | Found in sagebrush, perennial grasslands, wet meadows, and desert scrub from 4,000 to over than 9,000 feet in the eastern Sierra Nevada. | Unlikely to occur.<br>No appropriate habitat is present in the study area. Specifically:<br>• Primarily associated with sagebrush habitats with greater than 10% canopy cover. Sagebrush scrub habitat in the Project vicinity is sparse and has a canopy cover of less than 10%.<br>• Species is unlikely to occur west of Highway 395 (CDFW 2008).<br>No known occurrences of greater sage-grouse in the Project vicinity. The nearest known occurrence is approximately 24 miles southeast of the Project vicinity. |
| *Dendragapus fuliginosa howardi*<br>Mt. Pinos sooty grouse | — | FSCC | CSC | Restricted to the Southern Sierra Nevada and the Piute and Tehachapi mountains, Mt. Pinos/Mt. Able, and Frasier Mountain. | Unlikely to occur.<br>The study area is outside the geographic range of this species. |
| *Strix nebulosa*<br>great gray owl | — | FSCC | CE (nesting) | Nests in old growth coniferous forests and forages in montane meadows. Distribution includes high elevations of the western slope Sierra Nevada and Cascade ranges, from 2,100 to 8,100 feet in elevation (Wu et al. 2016). | Unlikely to occur.<br>The study area is outside the typical elevation range of this species and the Project vicinity does not provide suitable habitat. |
| *Coccyzus americanus occidentalis*<br>Yellow-billed cuckoo – Western DPS | FT | — | SE | Breeds and forages in riparian areas with low woody vegetation in lowland California, especially willow-cottonwood habitat. Currently known from the Sacramento River Valley and the South Fork of the Kern River (USFWS 2021b). USFWS has designated critical habitat for this species. The Project area is outside critical habitat. | Unlikely to occur.<br>The study area is outside the geographic range of this species. |
| *Strix occidentalis occidentalis*<br>California spotted owl | BCC | FSCC | CSC | Dense, old growth, multi-layered mixed conifer, redwood, Douglas-fir, and oak woodland habitats in the western slope of the Sierra Nevada, from sea level to elevations of approximately 7,600 feet. | Unlikely to occur.<br>The study area is outside the geographic range of this species. |
| *Empidonax traillii adastus*<br>willow flycatcher | — | FSCC | — | Found in the Great Basin and central Rocky Mountains south to Utah and Colorado. Found in a variety of shrubby habitats, but particularly montane riparian habitat with extensive growth of willows. | Unlikely to occur.<br>The study area is outside the geographic range of this species. |
| *Xanthocephalus xanthocephalus*<br>yellow-headed blackbird | — | — | CSC | Breeds and forages east of the Sierra Nevada in fresh emergent wetland with dense vegetation and deep water, often along borders of lakes or ponds. Winters in the Central Valley. | Unlikely to occur.<br>The Project does not contain suitable habitat for this species. |
| *Eumops perotis californicus*<br>western mastiff bat | — | — | CSC | Found in variety of habitats including desert scrub, chaparral, oak woodland, ponderosa pine, meadows and mixed conifer forests up to 4,600 feet in elevation. Distribution is likely limited by availability of significant rock features offering suitable roosting habitat. | Unlikely to occur.<br>The study area is outside the elevational range of this species. |
| *Brachylagus idahoensis*<br>pygmy rabbit | — | — | CSC | Associated with tall, dense, large-shrub stages of big sagebrush, greasewood, and rabbitbrush in Modoc, Lassen, and Mono counties. | Unlikely to occur.<br>Big sagebrush scrub within the Project vicinity is sparsely distributed and does not represent suitable habitat for this species. |

| Scientific/Common Name | Federal Status | Forest Service Status | State Status | Habitat | Likelihood for Occurrence |
|---|---|---|---|---|---|
| *Pekania* [=Martes] *pennanti*<br>fisher – Southern Sierra Nevada Distinct Population Segment [DPS] | FE | FSCC | ST | Large areas of mature, dense forest red fir, lodgepole pine, ponderosa pine, mixed conifer, and Jeffery pine forests with snags and greater than 50% canopy closure. Known from elevations of 4,000 to 8,000 feet. | Unlikely to occur.<br>The study area is outside the geographic range of this species. The only population of fishers known on the Inyo National Forest occurs on the Kern Plateau along the boundary of the Sequoia National Forest (Forest Service 2018). |
| *Ovis canadensis nelsoni*<br>Nelson desert bighorn sheep | — | FSCC | CFP | Found in Mojave desert mountains from southeastern Mono County south to Imperial County. Only known from the White Mountains within the Inyo National Forest (Forest Service 2018). | Unlikely to occur.<br>The study area is outside the geographic range of this species. |

LEGEND:

Federal Status
BCC = Birds of Conservation Concern
Eagle Act = Bald and Golden Eagle Protection Act
FC = Federal Candidate Species
FE = Federal Endangered
FPD = Federal Proposed for Delisting
FPT, FPE = Federal Proposed Threatened/Endangered

Forest Service Status
FSCC = Inyo National Forest Species of Conservation Concern

State Status
CFP = California Fully Protected
CSC = California Species of Special Concern
SCT, SCE = State Candidate Threatened/Endangered
SE = California Endangered
ST = California Threatened

**Table 8.5-6. Game Species Potentially Occurring within the FERC Project Boundary or within 1 Mile of the FERC Project Boundary**

| Species | Status | Habitat | General Season | Bag Limit | Possession Limit | Hunting Restrictions[1] |
|---|---|---|---|---|---|---|
| **Resident Game Birds** | | | | | | |
| sooty grouse (*Dendragapus fuliginosus*) | — | Uncommon to common permanent resident at middle to high elevations. Occurs in open, medium to mature aged stands of fir, Douglas-fir, and other conifer habitats, interspersed with medium to large openings, and available water. | General: September 9–October 9<br>Archery Only: August 19–September 8<br>Falconry: August 19–February 29 | 2 sooty grouse per day | Triple the daily bag limit | Hunting license is required. No use of motor vehicles to drive birds toward target. No use of mammal (or imitation) as blind. No take of nests or eggs. No use of practice dogs on birds outside of season. Must use ten-gauge shotgun or smaller, and no shot size larger than ball bearing. |
| mountain quail (*Oreortyx pictus*) | — | Common to uncommon resident, found typically in most major montane habitats of the state. Found seasonally in open, brushy stands of conifer and deciduous forest, woodland, and chaparral. | Zone Q1: September 9–October 20 | 10 per day | Triple the daily bag limit | |
| California quail (*Callipepla californica*) | — | Common, permanent resident of low and middle elevations. Found in shrub, scrub, and brush, open stages of conifer and deciduous habitats, and margins of grasslands and croplands. | Zone Q1: October 21–January 28 | | | |
| white-tailed ptarmigan (*Lagopus leucura*) | — | Permanent resident of high elevations on or above the tree line in areas of boulders, snowfields, rock slides, and meadows. In winter, frequents brushy areas. | General and Archery: September 9–17<br>Falconry: August 19–February 29 | 2 per day | 2 per season | |
| **Migratory Game Birds** | | | | | | |
| Canada goose (*Branta canadensis*) | — | Common resident and migrant, found throughout the state in fresh emergent wetlands, estuarine, lacustrine, and riverine habitats, ponds, pastures, croplands, and urban parks. | Early Season (Large only): September 30–October 2<br>Regular Season: October 21–January 28 | 30 per day | Triple the daily bag limit | Hunting license and state duck tag are required. Must use ten-gauge shotgun or smaller, and shot must be non-lead and non-toxic. Electronically-operated calling or sound-reproducing devices are prohibited. No use of practice dogs on birds outside of season. No take of nests or eggs. |
| mallard (*Anas platyrhynchos*) | — | Common resident and migrant, found throughout the state in fresh emergent wetlands, estuarine, lacustrine, and riverine habitats, ponds, pastures, croplands, and urban parks. | October 21–January 31 | 7 per day (no more than 2 females) | | |
| bufflehead (*Bucephala clangula*) | — | Uncommon to locally common east of the Sierra Nevada crest. Breeds in tree cavities near lakes and ponds bordered by open forest. | | 7 per day | | |
| common merganser (*Mergus merganser*) | — | Uncommon to locally common resident and migrant on lakes, ponds, and large streams of the Coast, Klamath, Cascade, and Sierra Nevada Ranges. | | | | |
| wood duck (*Aix sponsa*) | — | Common resident and migrant, found throughout the state in wetlands, swamps, freshwater marshes, beaver ponds, and streams of all sizes. | | | | |
| Green-winged teal (*Anas crecca*) | — | Common resident and migrant, found throughout the state in river deltas, forest wetlands, grassland and sedge meadows, beaver ponds, streams, potholes, lakes, and human-made wetlands. Winter in shallow wetlands, riparian sloughs, and rice fields. | | | | |
| American coot (*Fulica americana*) | — | Common resident and migrant, found throughout the state in a wide variety of freshwater wetlands where there are heavy stands of emergent aquatic vegetation along the shore and some depth of water where the emergent vegetation is present. | | 25 per day | | |

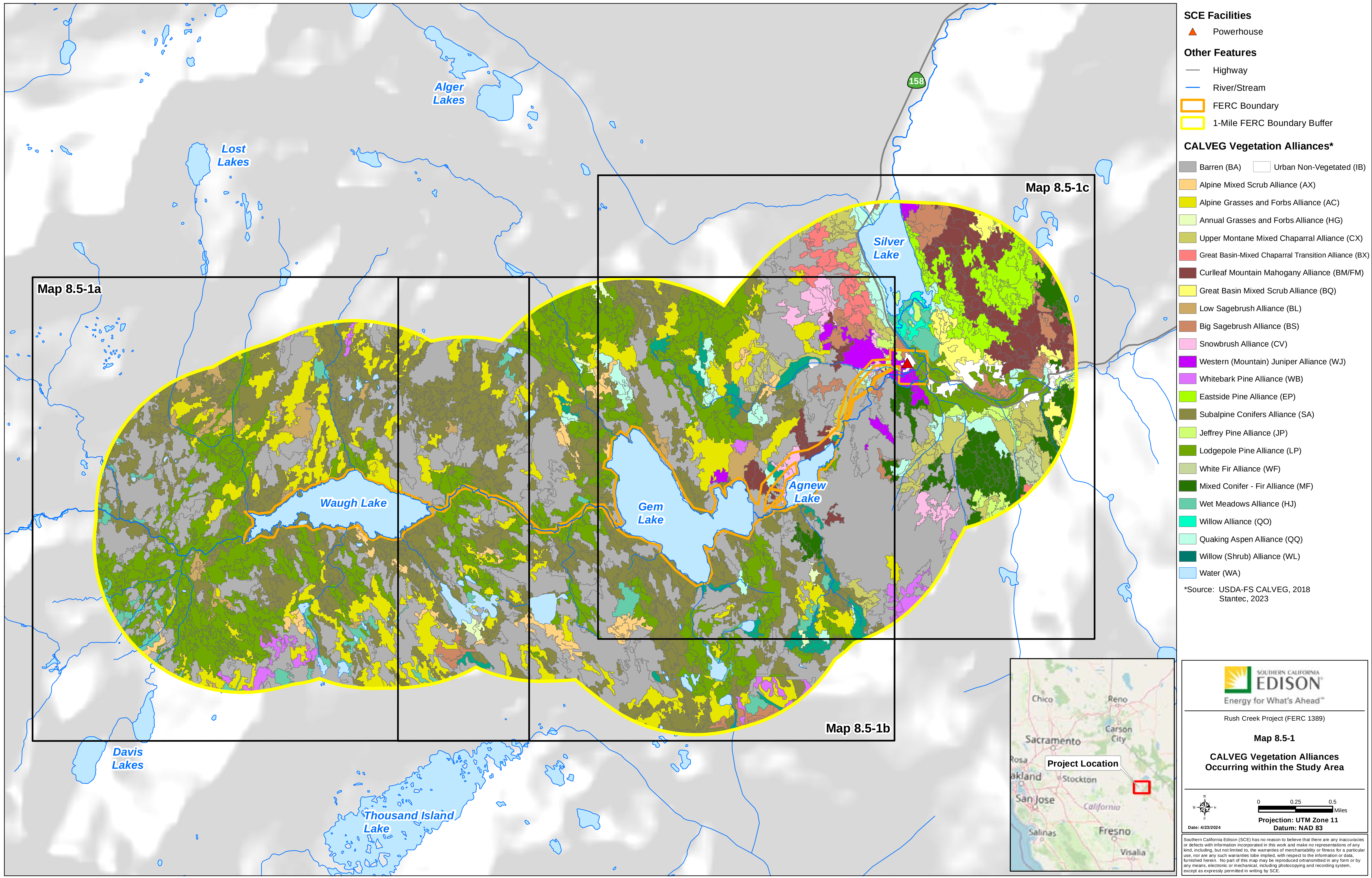
| Species | Status | Habitat | General Season | Bag Limit | Possession Limit | Hunting Restrictions[1] |
|---|---|---|---|---|---|---|
| mourning dove (*Zenaida macroura*) | — | Open woodlands, grasslands, croplands, open hardwood, hardwood-conifer, riparian, low elevation conifer, and deserts all provide adequate habitat. Requires a nearby water source. | September 1–15 and November 11–December 25 | 15 doves | Triple the daily bag limit | Hunting license and state duck tag are required. No use of motor vehicles to drive birds toward target. No use of mammal (or imitation) as blind. No take of nests or eggs. No use of practice dogs on birds outside of season. Must use ten-gauge shotgun or smaller, and no shot size larger than BB. |
| American crow (*Corvus brachyrhynchos*) | — | Occurs in valley and foothill hardwood and hardwood-conifer, valley foothill riparian, annual and perennial grasslands, orchard-vineyards, croplands, pasture, and urban habitats. A summer resident of higher elevations. | December 2–April 3 | 24 | Double the daily bag | May be only taken by landowners or tenants when crows are committing depredations or concentrated in such numbers and manner as to constitute a health hazard or other nuisance. May only be taken by firearm, bow and arrow, falconry, or by toxicants approved by the Department of Food and Agriculture for the specific purpose of taking crows. It is unlawful to offer any prize or other inducement as a reward for the taking of crows in a contest, tournament, or derby. |
| **Mammals** | | | | | | |
| Nuttall's cottontail (*Silvilagus nuttalii*) | — | This species is considered resident small game under the California Fish and Wildlife Code. Found on the east slope of the Sierra Nevada and the cascades. Prefers rocky, sage-covered hills and canyons, montane riparian, and subalpine conifer habitats from 4,500 to 10,500 feet in elevation. | General: July 1–January 31<br>Falconry Only: February 1–March 21 | 5 per day | 10 | Hunting license is required. May use shotguns, bow and arrow, air rifles, pistols. Must use ten-gauge shotgun or smaller, and no shot size larger than BB. Coursing dogs may be used to take rabbits. |
| western white-tailed jackrabbit (*Lepus townsendii townsendii*) | CSC | This species is considered resident small game under the California Fish and Wildlife Code. Open areas with scattered shrubs in sagebrush, subalpine conifer, juniper, alpine dwarf-shrub, and perennial grassland habitats in the high eastern Sierra. Also uses low sagebrush, wet meadow, and early successional stages of various conifer habitats. Moves seasonally to lower elevations in the winter. | Open all year | No limit | No limit | |
| black-tailed jackrabbit (*Lepus californicus*) | — | This species is considered resident small game under the California Fish and Wildlife Code. Found in a variety of habitats throughout the state, particularly in grasslands and desert-shrub areas on open, early stages of forests and chaparral. | | | | |
| American beaver (*Castor canadensis*) | — | This species is considered a furbearing mammal under the California Fish and Wildlife code. Found in streams, ponds, and lake margins in the Central Valley, foothills, and mountains of California. | November 1–March 31 | No limit | No limit | Hunting license is required. May use firearms, bow and arrow, and approved traps with trapping permit. Dogs permitted. |

| Species | Status | Habitat | General Season | Bag Limit | Possession Limit | Hunting Restrictions[1] |
|---|---|---|---|---|---|---|
| gray fox (*Urocyon cinereoargenteus*) | — | This species is considered a furbearing mammal under the California Fish and Wildlife code.<br>Uncommon to common permanent resident of low to middle elevations throughout most of the state. Frequents most shrublands, valley foothill riparian, montane riparian, and brush stages of many deciduous and conifer forest and woodland habitats. Also found in meadows and cropland areas. Suitable habitat consists of shrublands, brushy and open-canopied forests, interspersed with riparian areas, providing water. | November 24–last day of February | No limit | No limit | Hunting license is required. May use firearms, bow and arrow, and approved traps with trapping permit. Dogs permitted. |
| Raccoon (Procyon lotor) | — | This species is considered a furbearing mammal under the California Fish and Wildlife Code.<br>Widespread, common to uncommon permanent resident throughout most of the state. Occurs in all habitats except alpine and desert types without water; marginal in Great Basin shrub types. Most abundant in riparian and wetland areas at low to middle elevations. | November 16–March 31 | No limit | No limit | Hunting license is required. May use firearm, bow and arrow, or with the use of dogs, or traps in accordance with trapping regulations. When taking raccoon after dark, pistols and rifles not larger than 22 caliber rimfire and shoguns using shot no larger than No. BB are the only firearms which may be used during this night period. Dogs may permitted to pursue raccoons in the course of breaking, training or practicing dogs. |
| American mink (*Mustela vison*) | — | This species is considered a furbearing mammal under the California Fish and Wildlife Code.<br>Uncommon permanent resident, generally occurring in the northern half of the state. Semiaquatic, inhabiting most aquatic habitats, including some coastal areas. Occurs at elevation up to about 9,000 feet. | November 16–March 31 | No limit | No limit | Hunting license is required. May use firearms, bow and arrow, and approved traps with trapping permit. |
| American badger (*Taxidea taxus*) | CSC | This species is considered a furbearing mammal under the California Fish and Wildlife Code.<br>Occurs throughout most of the state in areas with dry, friable soils. It is most abundant in drier open stages of most shrub, forest, and herbaceous habitats up to 12,000 feet in elevation. | November 16–last day of February | No limit | No limit | |
| black bear (*Ursus americanus*) | — | This species is considered a big game mammal under the California Fish and Wildlife Code.<br>Widespread, common to uncommon resident occurring from sea level to high mountain regions. Occurs in fairly dense, mature stands of many forest habitats, and feeds in a variety of habitats including brushy stands of forest, valley foothill riparian, and wet meadow. | Opens with deer season – December 7 or 31 or until 1,700 bears are harvested. | 1 adult/season/tag | 1 adult/season/tag | Requires hunting license and hunting tags. May use approved rifles, bow and arrow, and approved shotguns. Cubs and females accompanied by cubs may not be taken. |
| mule deer (*Odocoileus hemionus*) | — | This species is considered a big game mammal under the California Fish and Wildlife Code. | The season in zone X-9a shall open on the third Saturday in September and extend for 24 consecutive days. | 1 buck (forked horn or better)/tag | 1 buck (forked horn or better)/tag | Requires hunting license and hunting tags. May use approved rifles, bow and arrow, approved shotguns, and crossbows. Only bucks with antlers with demonstrable forks (or greater) may be taken. |

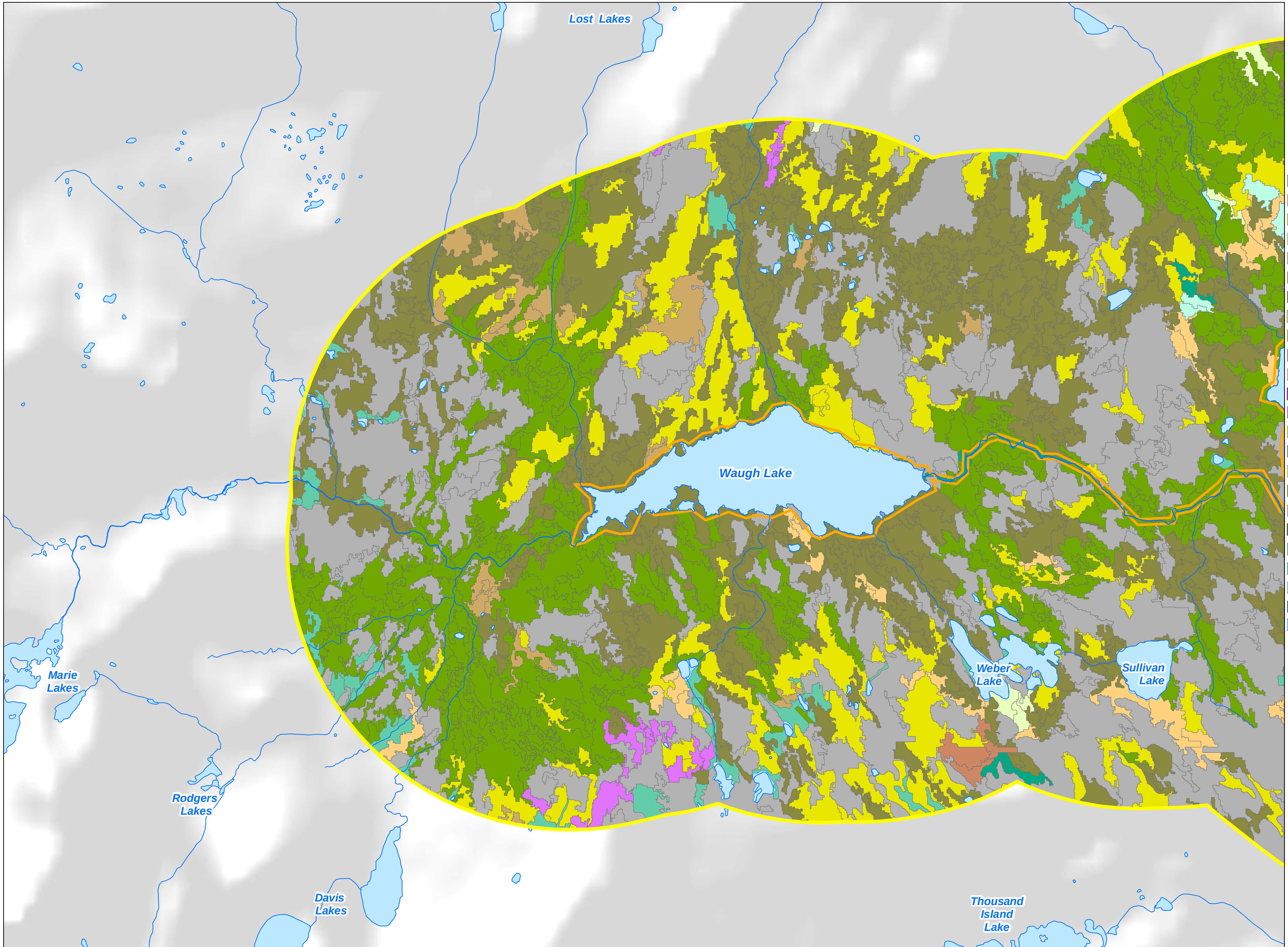
Notes: CSC = California Species of Special Concern

1 Beginning July 1, 2019, non-lead ammunition is required when taking any wildlife with a firearm anywhere in California.

# MAPS




C:\GIS\237800343\map\Rush Creek\TerrestrialMaps\SCE_RUSH_CREEK_CALVEG_1mile_Buff_Index_17i11i_05.mxd




**SCE Facilities**

- Powerhouse

**Other Features**

- Highway
- River/Stream
- FERC Boundary
- 1-Mile FERC Boundary Buffer

**CALVEG Vegetation Alliances***

- Barren (BA)
- Urban Non-Vegetated (IB)
- Alpine Mixed Scrub Alliance (AX)
- Alpine Grasses and Forbs Alliance (AC)
- Annual Grasses and Forbs Alliance (HG)
- Upper Montane Mixed Chaparral Alliance (CX)
- Great Basin-Mixed Chaparral Transition Alliance (BX)
- Curlleaf Mountain Mahogany Alliance (BM/FM)
- Great Basin Mixed Scrub Alliance (BQ)
- Low Sagebrush Alliance (BL)
- Big Sagebrush Alliance (BS)
- Snowbrush Alliance (CV)
- Western (Mountain) Juniper Alliance (WJ)
- Whitebark Pine Alliance (WB)
- Eastside Pine Alliance (EP)
- Subalpine Conifers Alliance (SA)
- Jeffrey Pine Alliance (JP)
- Lodgepole Pine Alliance (LP)
- White Fir Alliance (WF)
- Mixed Conifer - Fir Alliance (MF)
- Wet Meadows Alliance (HJ)
- Willow Alliance (QO)
- Quaking Aspen Alliance (QQ)
- Willow (Shrub) Alliance (WL)
- Water (WA)

*Source: USDA-FS CALVEG, 2018
Stantec, 2023

SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead

Rush Creek Project (FERC 1389)

**Map 8.5-1a**

**CALVEG Vegetation Alliances Occurring within the Study Area**

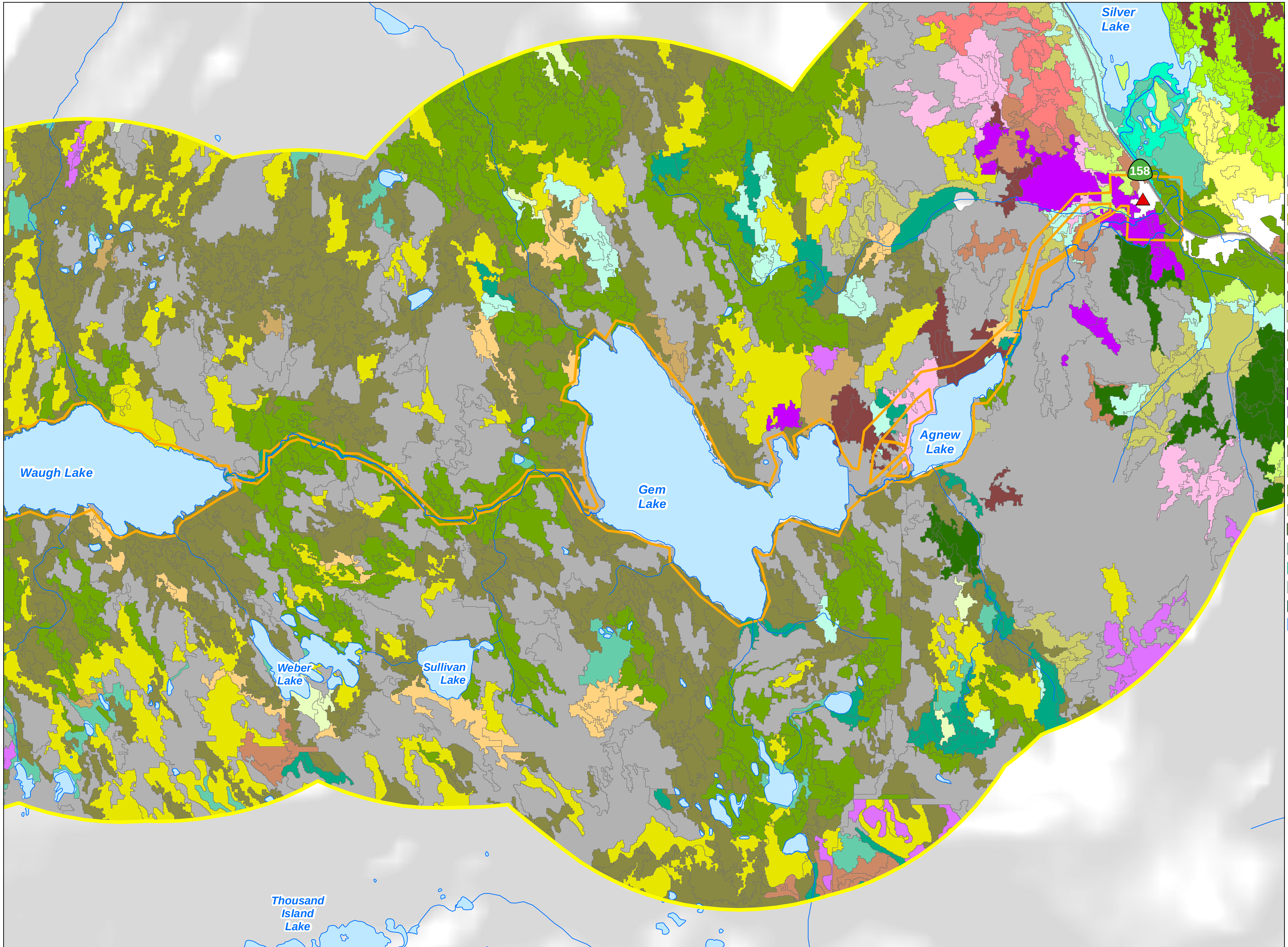
0 500 1,000 2,000 Feet

Date: 4/23/2024

**Projection: UTM Zone 11**
**Datum: NAD 83**



C:\GIS\237800343\map\Rush Creek\TerrestrialMaps\SCE_RUSH_CREEK_CALVEG_1mile_Buff_Sheets_17i11i_05.mxd




**SCE Facilities**

Powerhouse

**Other Features**

Highway

River/Stream

FERC Boundary

1-Mile FERC Boundary Buffer

**CALVEG Vegetation Alliances***

Barren (BA)
Urban Non-Vegetated (IB)
Alpine Mixed Scrub Alliance (AX)
Alpine Grasses and Forbs Alliance (AC)
Annual Grasses and Forbs Alliance (HG)
Upper Montane Mixed Chaparral Alliance (CX)
Great Basin-Mixed Chaparral Transition Alliance (BX)
Curlleaf Mountain Mahogany Alliance (BM/FM)
Great Basin Mixed Scrub Alliance (BQ)
Low Sagebrush Alliance (BL)
Big Sagebrush Alliance (BS)
Snowbrush Alliance (CV)
Western (Mountain) Juniper Alliance (WJ)
Whitebark Pine Alliance (WB)
Eastside Pine Alliance (EP)
Subalpine Conifers Alliance (SA)
Jeffrey Pine Alliance (JP)
Lodgepole Pine Alliance (LP)
White Fir Alliance (WF)
Mixed Conifer - Fir Alliance (MF)
Wet Meadows Alliance (HJ)
Willow Alliance (QO)
Quaking Aspen Alliance (QQ)
Willow (Shrub) Alliance (WL)
Water (WA)

*Source: USDA-FS CALVEG, 2018
Stantec, 2023

SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead

Rush Creek Project (FERC 1389)

**Map 8.5-1b**

**CALVEG Vegetation Alliances Occurring within the Study Area**

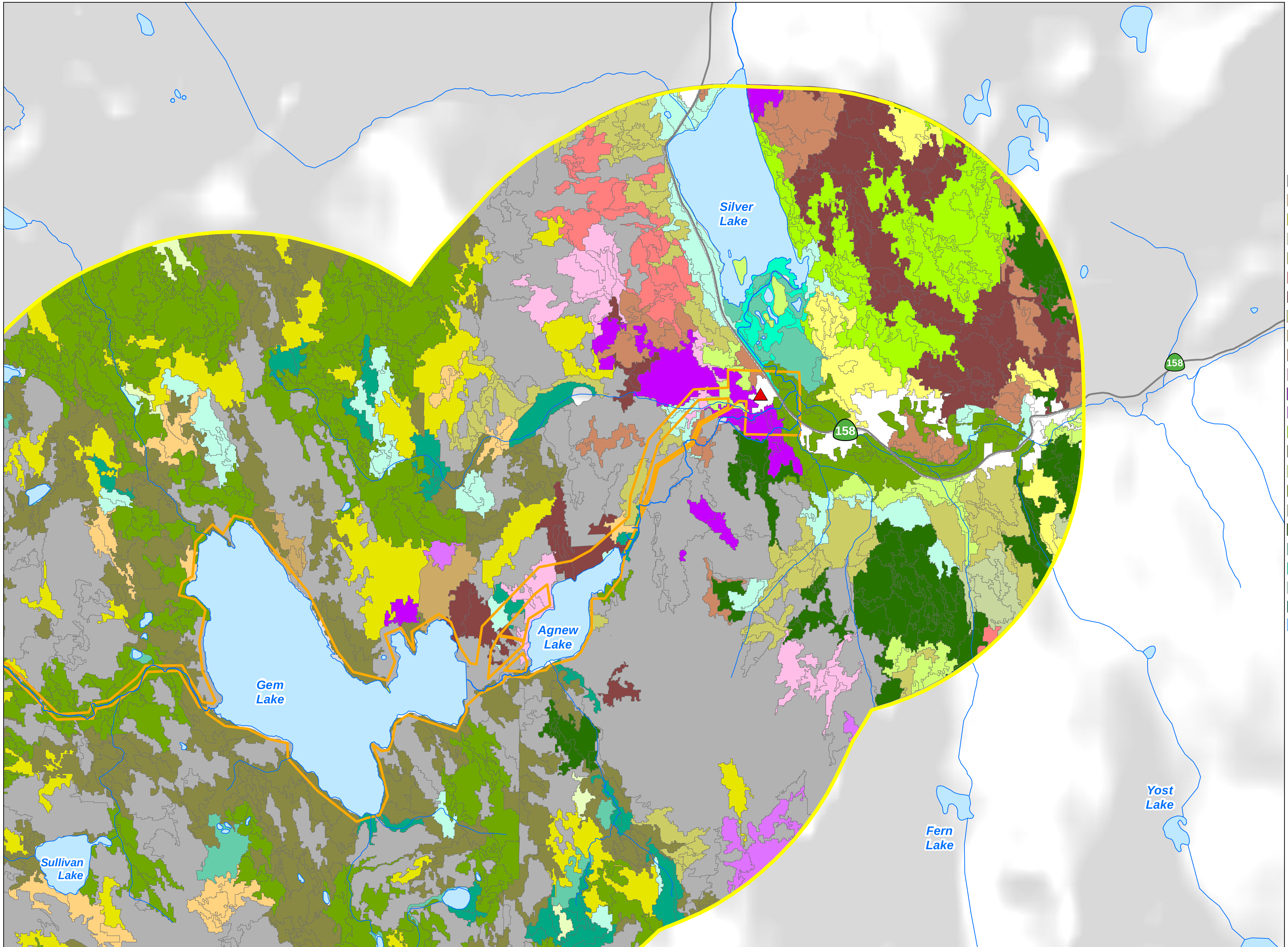
0 500 1,000 2,000 Feet

Date: 4/23/2024

**Projection: UTM Zone 11**
**Datum: NAD 83**



C:\GIS\237800343\map\Rush Creek\TerrestrialMaps\SCE_RUSH_CREEK_CALVEG_1mile_Buff_Sheets_17i11i_05.mxd




**SCE Facilities**

Powerhouse

**Other Features**

Highway

River/Stream

FERC Boundary

1-Mile FERC Boundary Buffer

**CALVEG Vegetation Alliances***

Barren (BA)
Urban Non-Vegetated (IB)
Alpine Mixed Scrub Alliance (AX)
Alpine Grasses and Forbs Alliance (AC)
Annual Grasses and Forbs Alliance (HG)
Upper Montane Mixed Chaparral Alliance (CX)
Great Basin-Mixed Chaparral Transition Alliance (BX)
Curlleaf Mountain Mahogany Alliance (BM/FM)
Great Basin Mixed Scrub Alliance (BQ)
Low Sagebrush Alliance (BL)
Big Sagebrush Alliance (BS)
Snowbrush Alliance (CV)
Western (Mountain) Juniper Alliance (WJ)
Whitebark Pine Alliance (WB)
Eastside Pine Alliance (EP)
Subalpine Conifers Alliance (SA)
Jeffrey Pine Alliance (JP)
Lodgepole Pine Alliance (LP)
White Fir Alliance (WF)
Mixed Conifer - Fir Alliance (MF)
Wet Meadows Alliance (HJ)
Willow Alliance (QO)
Quaking Aspen Alliance (QQ)
Willow (Shrub) Alliance (WL)
Water (WA)

*Source: USDA-FS CALVEG, 2018
Stantec, 2023

SOUTHERN CALIFORNIA EDISON®
Energy for What's Ahead℠

Rush Creek Project (FERC 1389)

**Map 8.5-1c**

**CALVEG Vegetation Alliances Occurring within the Study Area**

N S W E

0 500 1,000 2,000 Feet

**Date: 4/23/2024**

**Projection: UTM Zone 11**
**Datum: NAD 83**



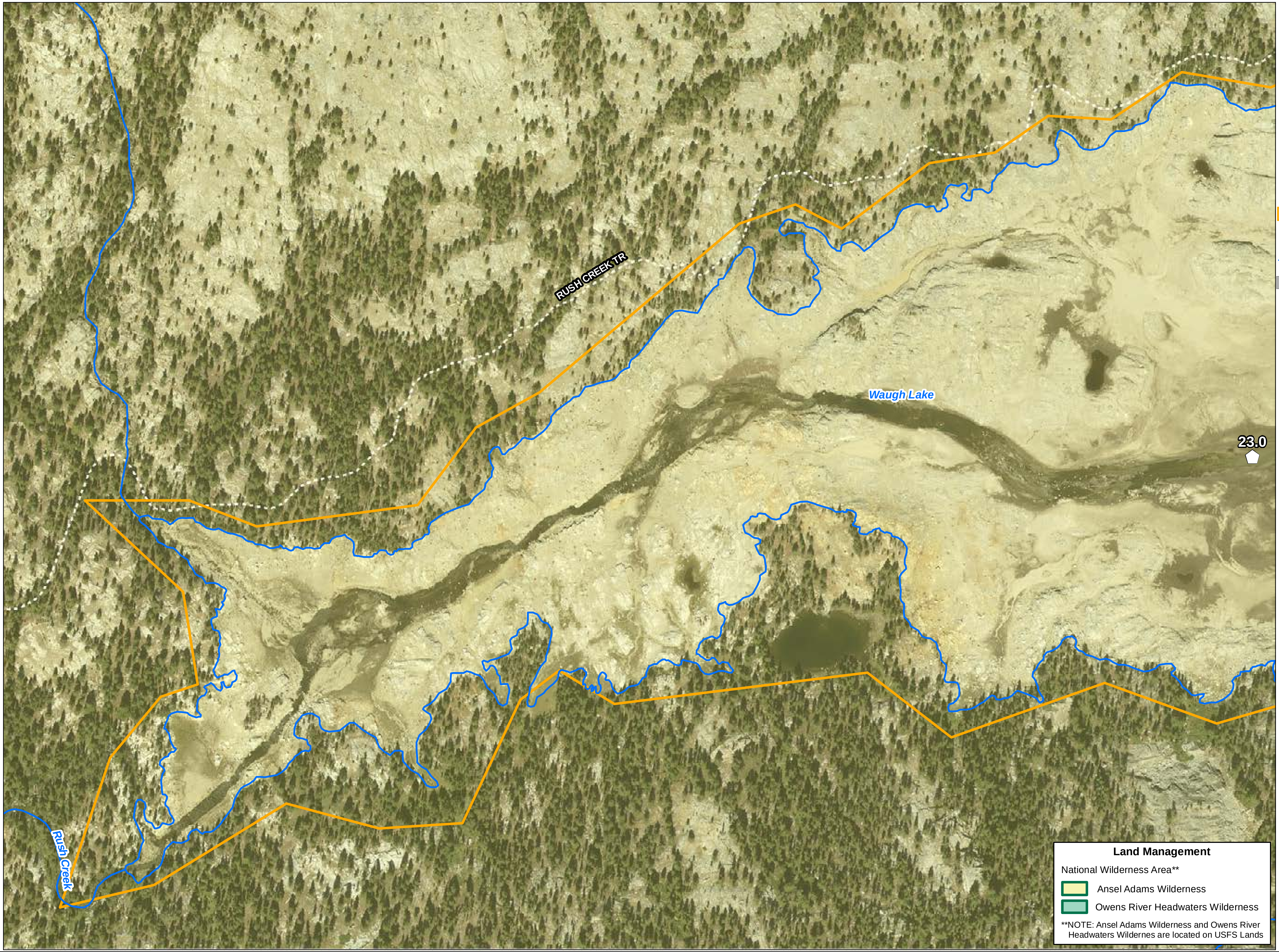
C:\GIS\237800343\map\Rush Creek\TerrestrialMaps\SCE_RUSH_CREEK_CALVEG_1mile_Buff_Sheets_17i11i_05.mxd

# CONFIDENTIAL INFORMATION

The following maps are being withheld from public disclosure in accordance with applicable regulations. It contains details on the locations of special-status biological resources and qualifies as Confidential Information (18 Code of Federal Regulations § 385.1112). Disclosure of such information could be harmful to these resources. To further understand the Federal Energy Regulatory Commission's regulations regarding confidential filings, visit: https://www.ferc.gov/foia.

**Maps 8.5-2a–i Special-Status Plants within the FERC Project Boundary (Confidential)**

Maps 8.5-2a–i 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.




**SCE Facilities**

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

**Other Features**

- Watercourse
- Water Body
- Non-Project Trail

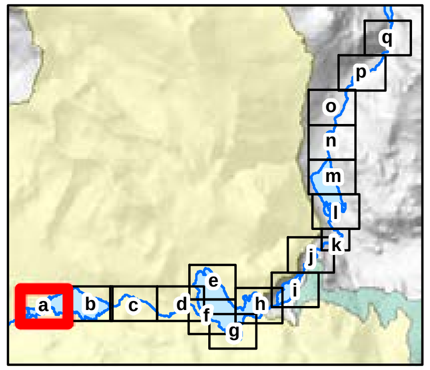
**General Sampling Locations**

- Riparian Sampling Sites

**Non-Native Invasive Plants**

- 1 Species Present
- 2-3 Species Present
- 4-5 Species Present
- 6+ Species Present

Population ID Example = "Gem Lake 1." Refer to Table 1-4 for more detailed information on each population.




**Land Management**

National Wilderness Area**

- Ansel Adams Wilderness
- Owens River Headwaters Wilderness

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

SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead

Rush Creek Project (FERC 1389)

**Map 8.5-3a**

**Non-Native Invasive Plant Species Occurring within the FERC Project Boundary and Vicinity**

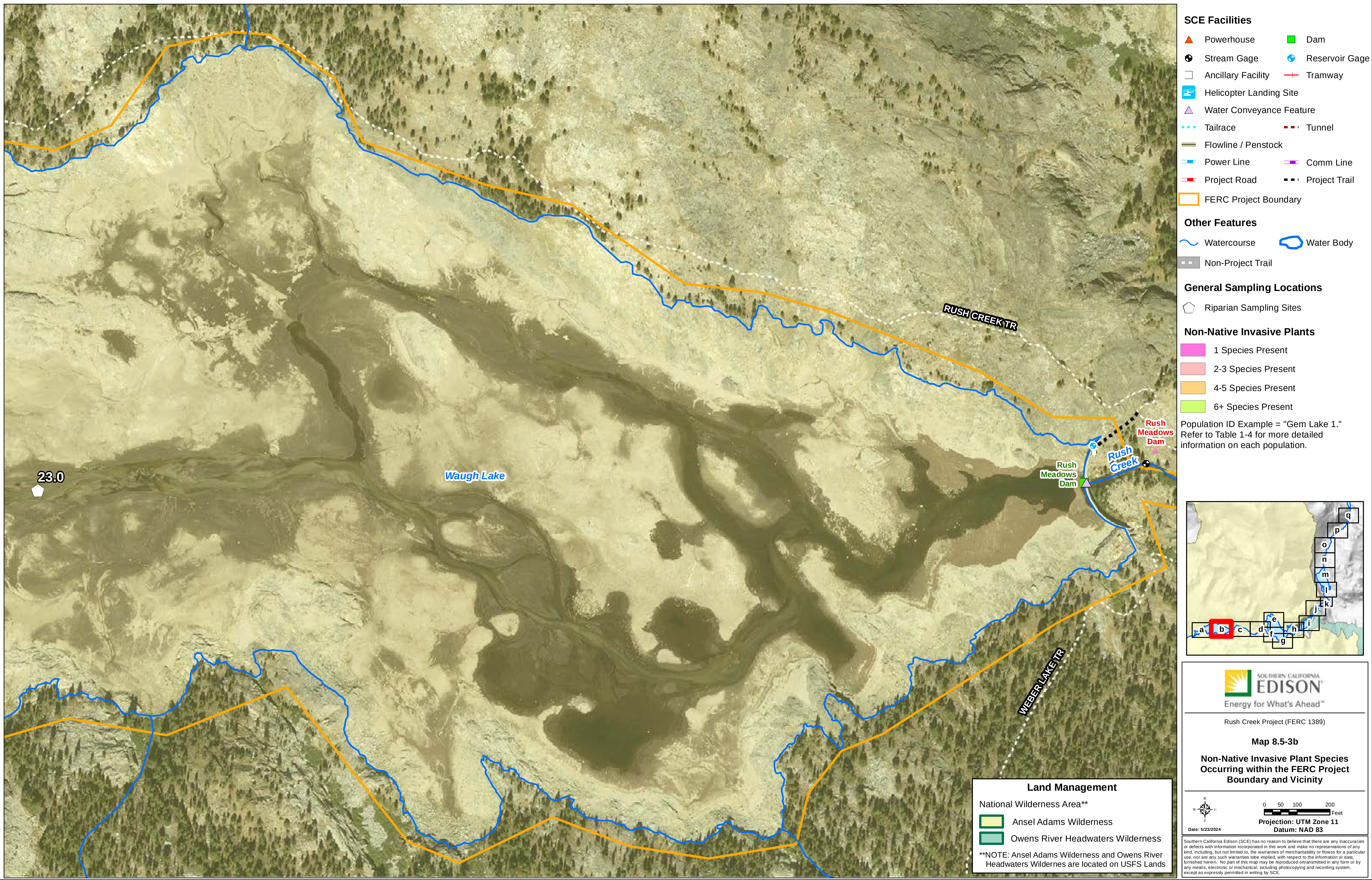
0 50 100 200 Feet

**Projection: UTM Zone 11**
**Datum: NAD 83**

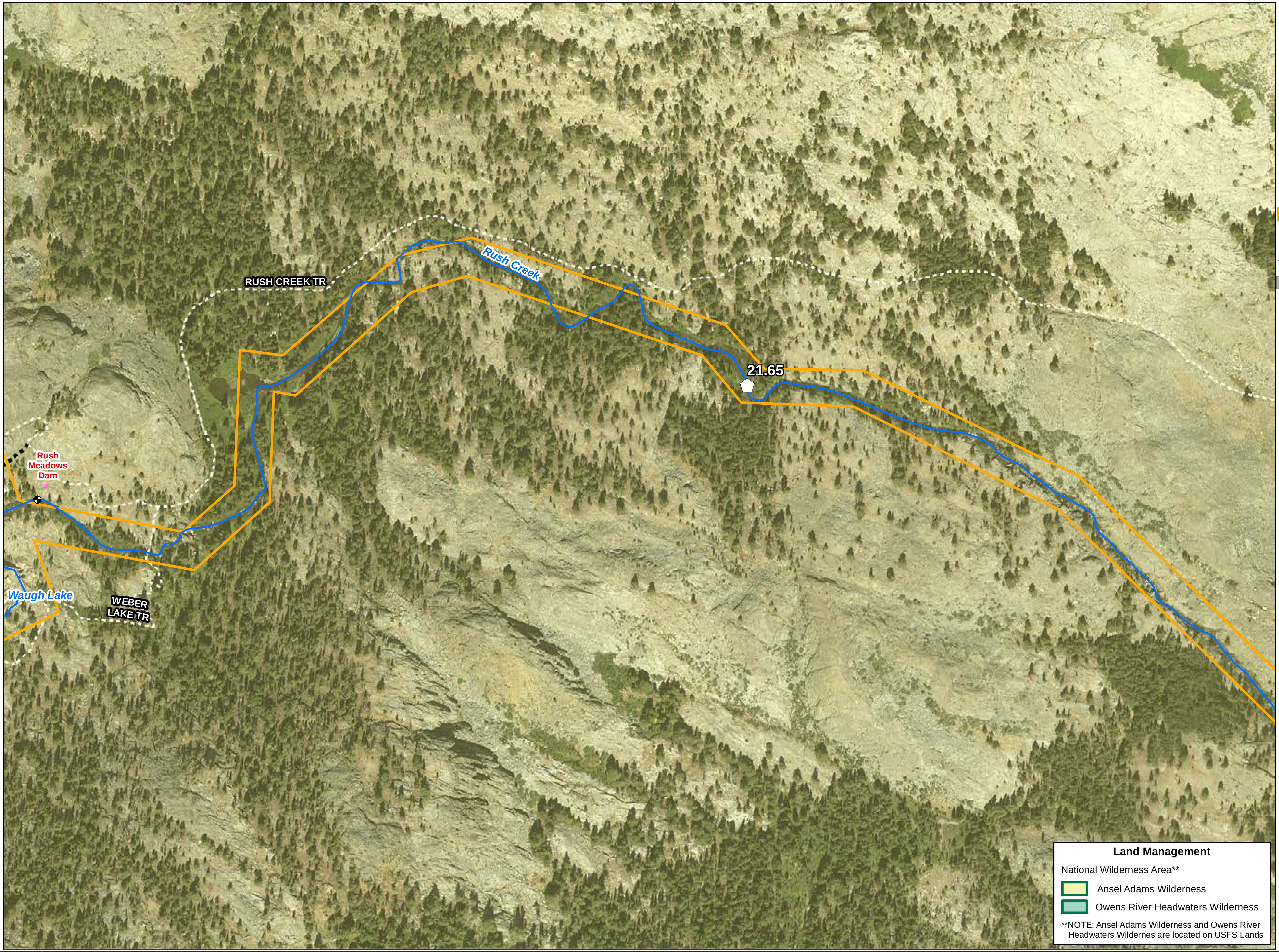
**Date: 5/23/2024**



C:\GIS\237800343\map\Rush Creek\TerrestrialMaps\SCE_RUSH_CREEK_NNIPlants_17i11i_03.mxd




C:\GIS\237800343\map\Rush Creek\TerrestrialMaps\SCE_RUSH_CREEK_NNIPlants_17i11i_03.mxd




**SCE Facilities**

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

**Other Features**

- Watercourse
- Water Body
- Non-Project Trail

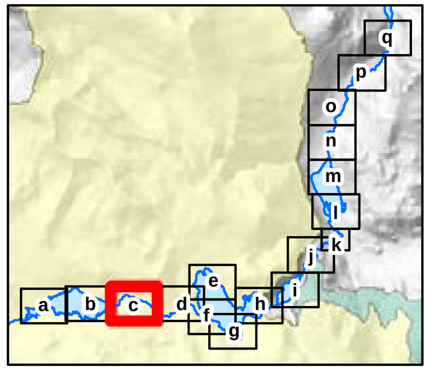
**General Sampling Locations**

- Riparian Sampling Sites

**Non-Native Invasive Plants**

- 1 Species Present
- 2-3 Species Present
- 4-5 Species Present
- 6+ Species Present

Population ID Example = "Gem Lake 1." Refer to Table 1-4 for more detailed information on each population.




SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead℠

Rush Creek Project (FERC 1389)

**Map 8.5-3c**

**Non-Native Invasive Plant Species Occurring within the FERC Project Boundary and Vicinity**

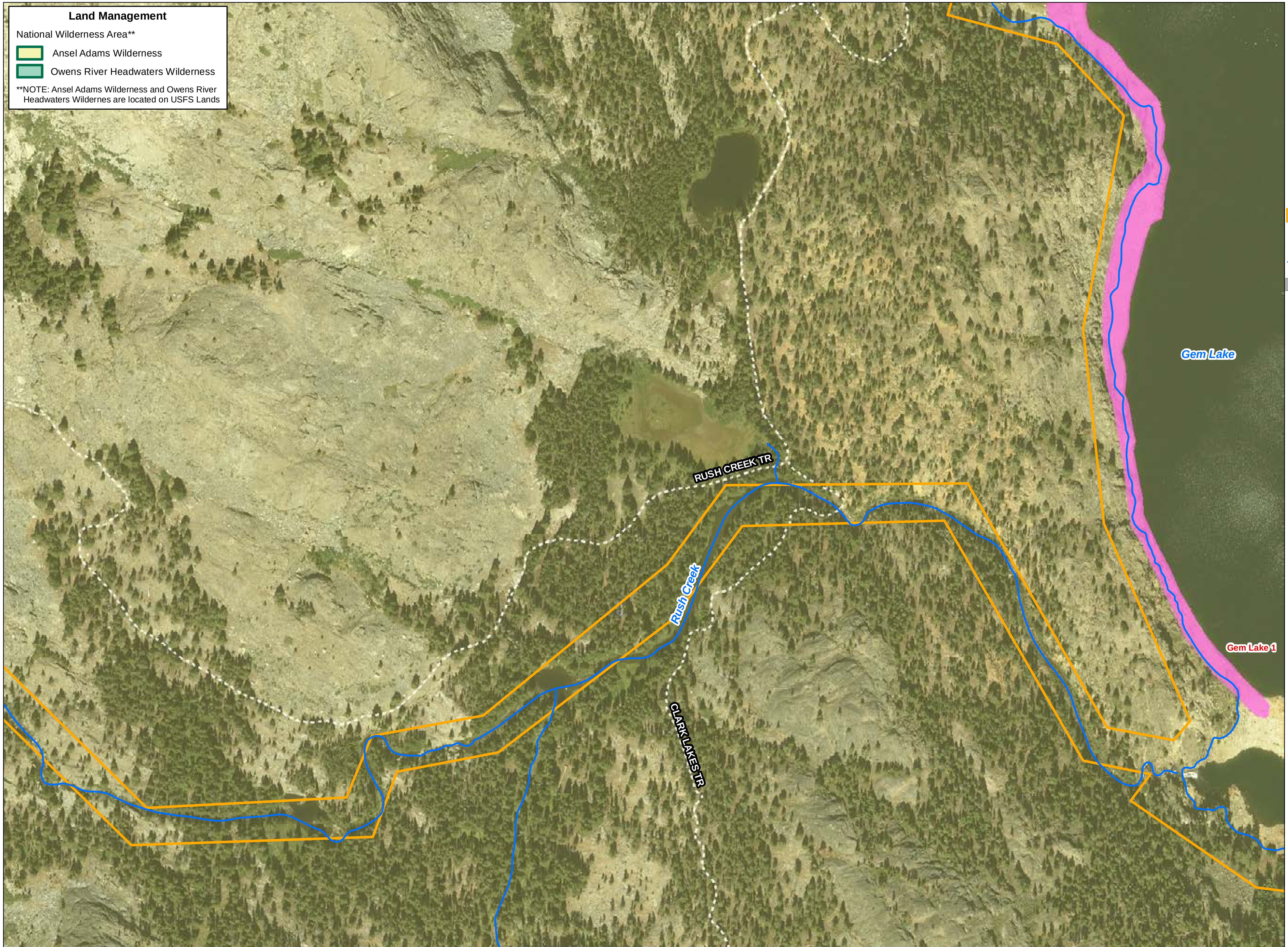
0 50 100 200 Feet

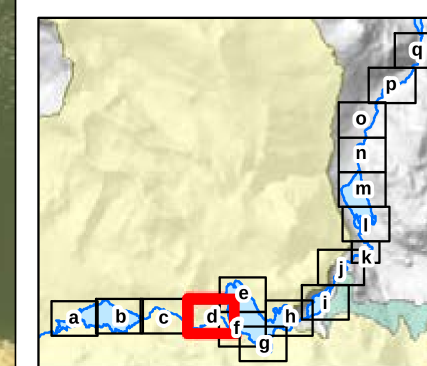
**Projection: UTM Zone 11**
**Datum: NAD 83**

**Date: 5/23/2024**



C:\GIS\237800343\map\Rush Creek\TerrestrialMaps\SCE_RUSH_CREEK_NNIPlants_17i11i_03.mxd




SCE Facilities

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

Other Features

- Watercourse
- Water Body
- Non-Project Trail

General Sampling Locations

- Riparian Sampling Sites

Non-Native Invasive Plants

- 1 Species Present
- 2-3 Species Present
- 4-5 Species Present
- 6+ Species Present

Population ID Example = "Gem Lake 1." Refer to Table 1-4 for more detailed information on each population.

SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead℠

Rush Creek Project (FERC 1389)

**Map 8.5-3d**

**Non-Native Invasive Plant Species Occurring within the FERC Project Boundary and Vicinity**

Date: 5/23/2024

0 50 100 200 Feet

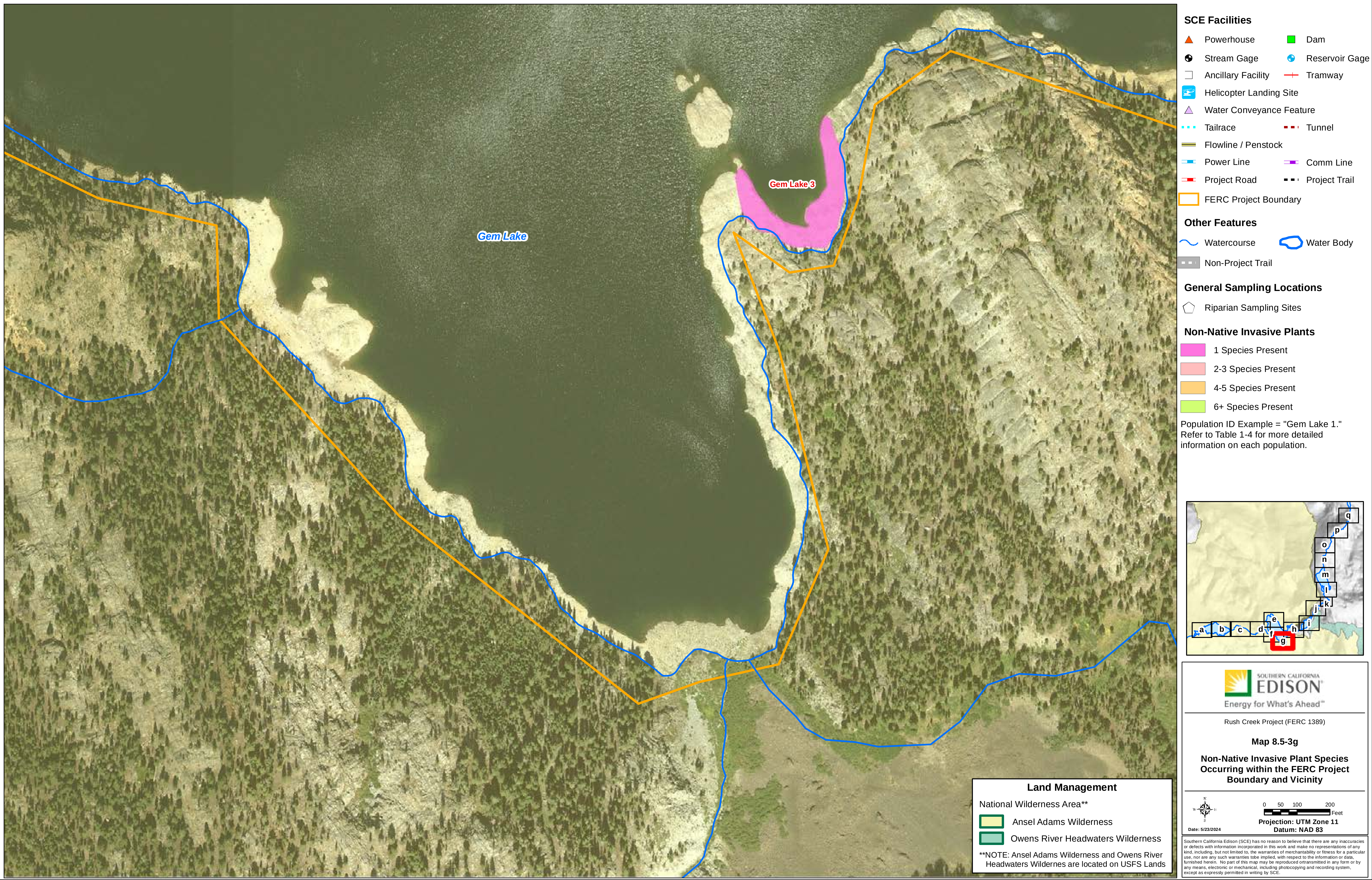
**Projection: UTM Zone 11**
**Datum: NAD 83**



C:\GIS\237800343\map\Rush Creek\TerrestrialMaps\SCE_RUSH_CREEK_NNIPlants_17i11i_03.mxd

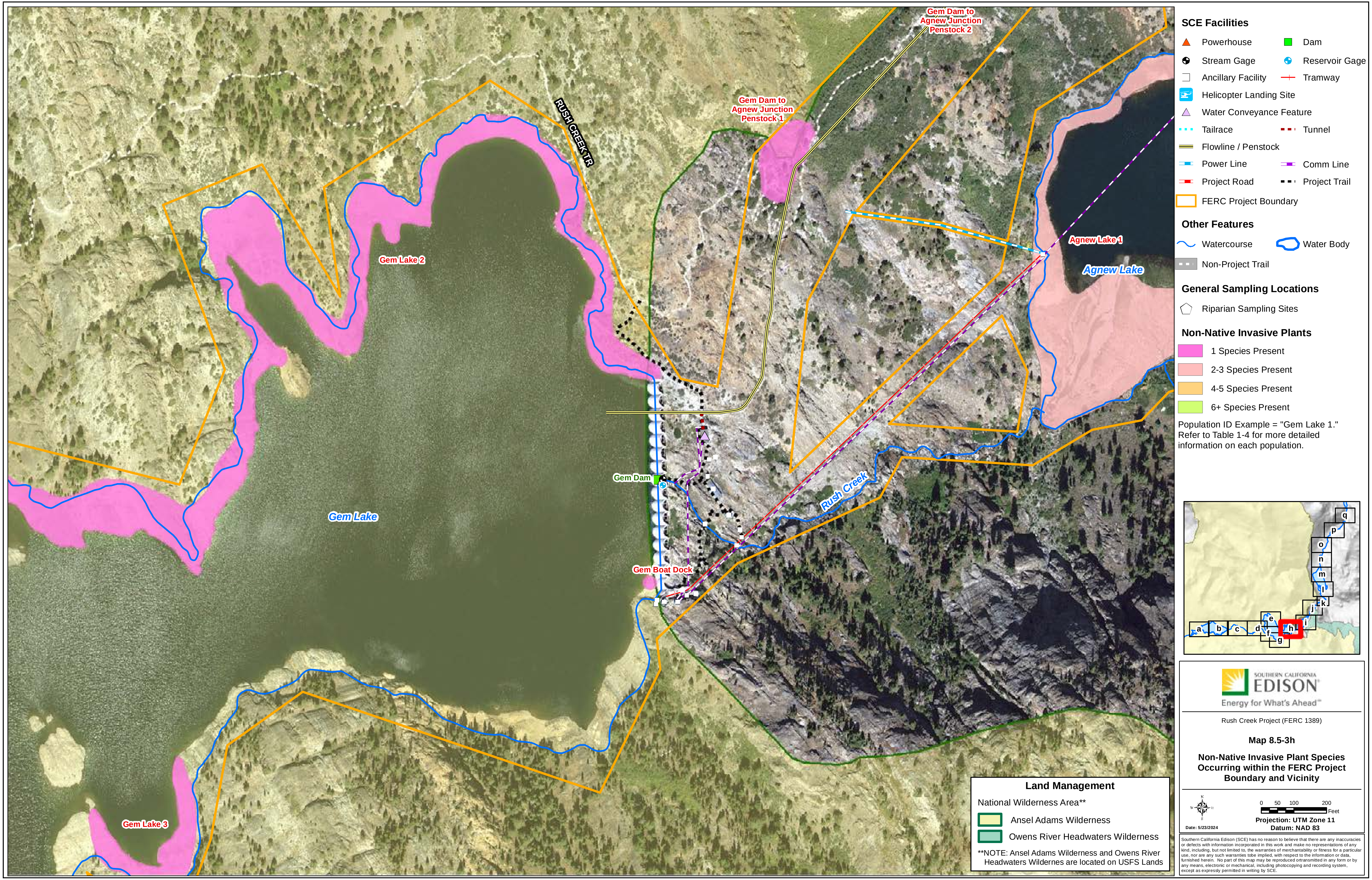

C:\GIS\237800343\map\Rush Creek\TerrestrialMaps\SCE_RUSH_CREEK_NNIPlants_17i11i_03.mxd


C:\GIS\237800343\map\Rush Creek\TerrestrialMaps\SCE_RUSH_CREEK_NNIPlants_17i11i_03.mxd

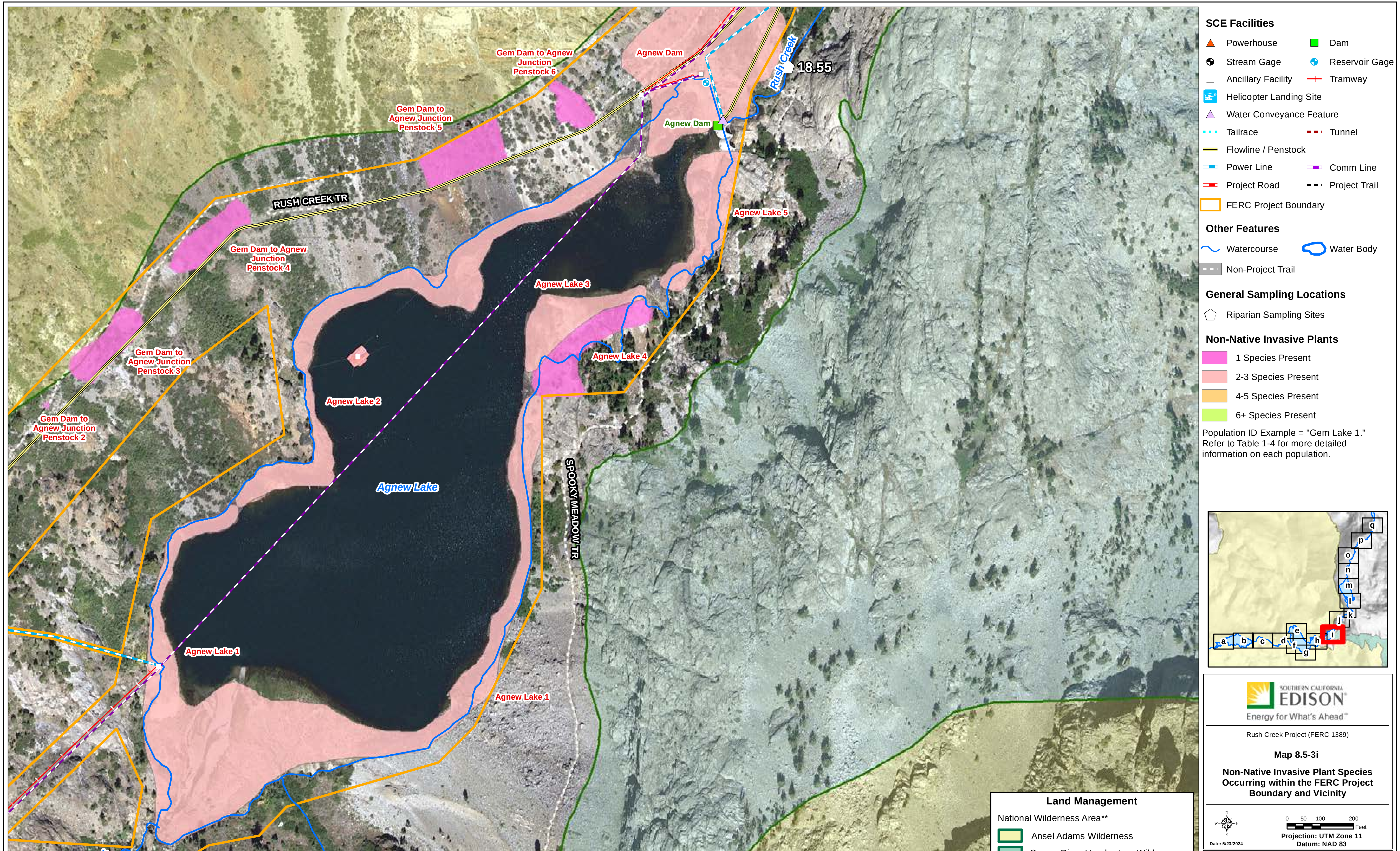





C:\GIS\237800343\map\Rush Creek\TerrestrialMaps\SCE_RUSH_CREEK_NNIPlants_17i11i_03.mxd



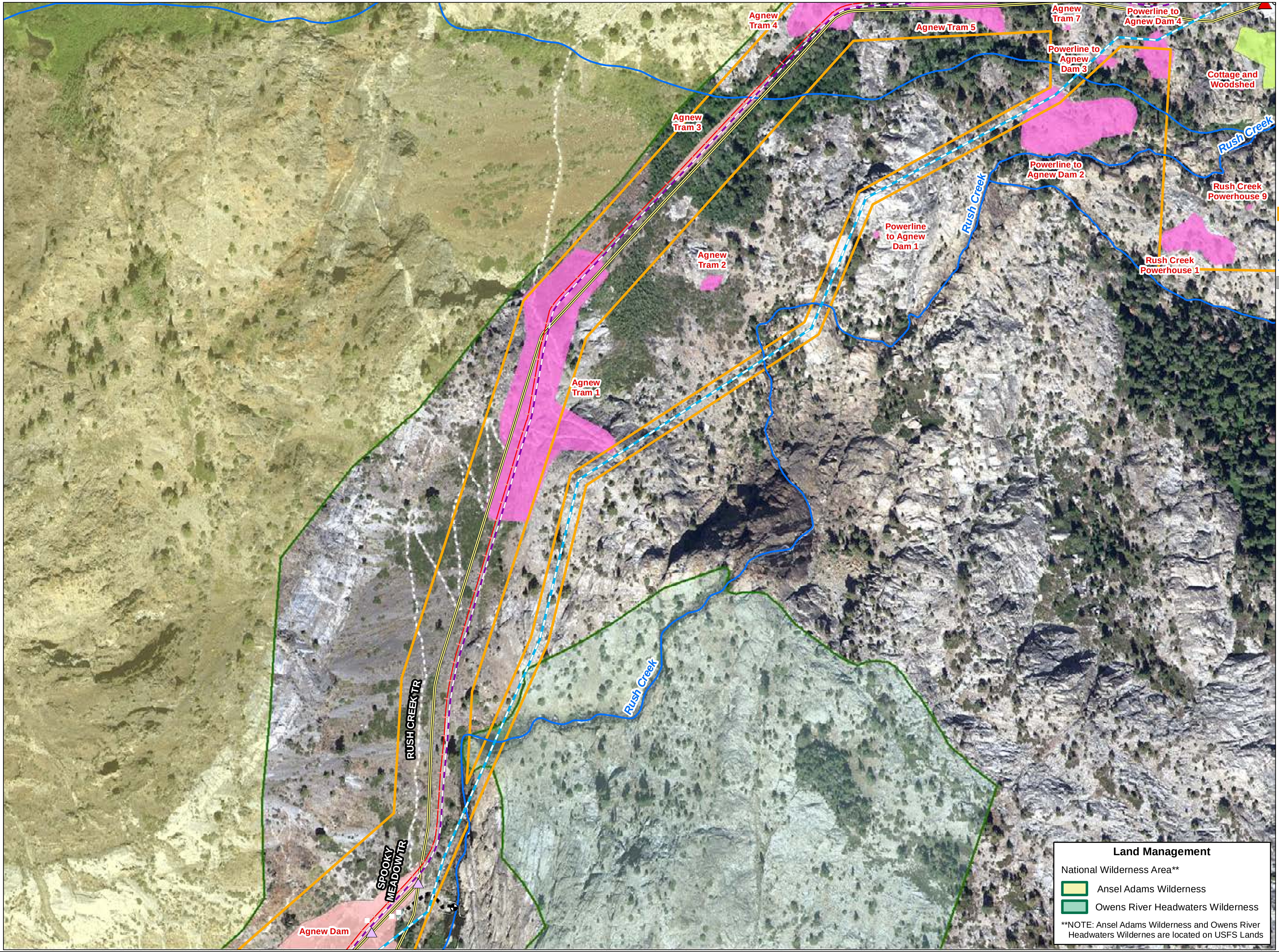

C:\GIS\237800343\map\Rush Creek\TerrestrialMaps\SCE_RUSH_CREEK_NNIPlants_17i11i_03.mxd








C:\GIS\237800343\map\Rush Creek\TerrestrialMaps\SCE_RUSH_CREEK_NNIPlants_17i11i_03.mxd




### SCE Facilities

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

### Other Features

- Watercourse
- Water Body
- Non-Project Trail

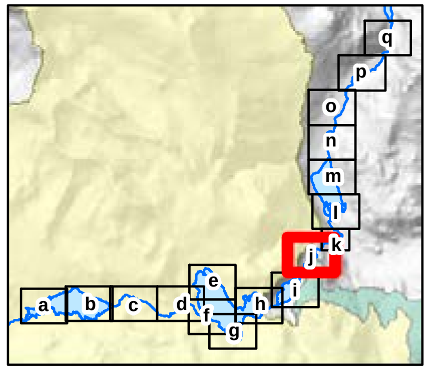
### General Sampling Locations

- Riparian Sampling Sites

### Non-Native Invasive Plants

- 1 Species Present
- 2-3 Species Present
- 4-5 Species Present
- 6+ Species Present

Population ID Example = "Gem Lake 1." Refer to Table 1-4 for more detailed information on each population.




SOUTHERN CALIFORNIA EDISON

Energy for What's Ahead℠

Rush Creek Project (FERC 1389)

**Map 8.5-3j**

**Non-Native Invasive Plant Species Occurring within the FERC Project Boundary and Vicinity**

N S W E

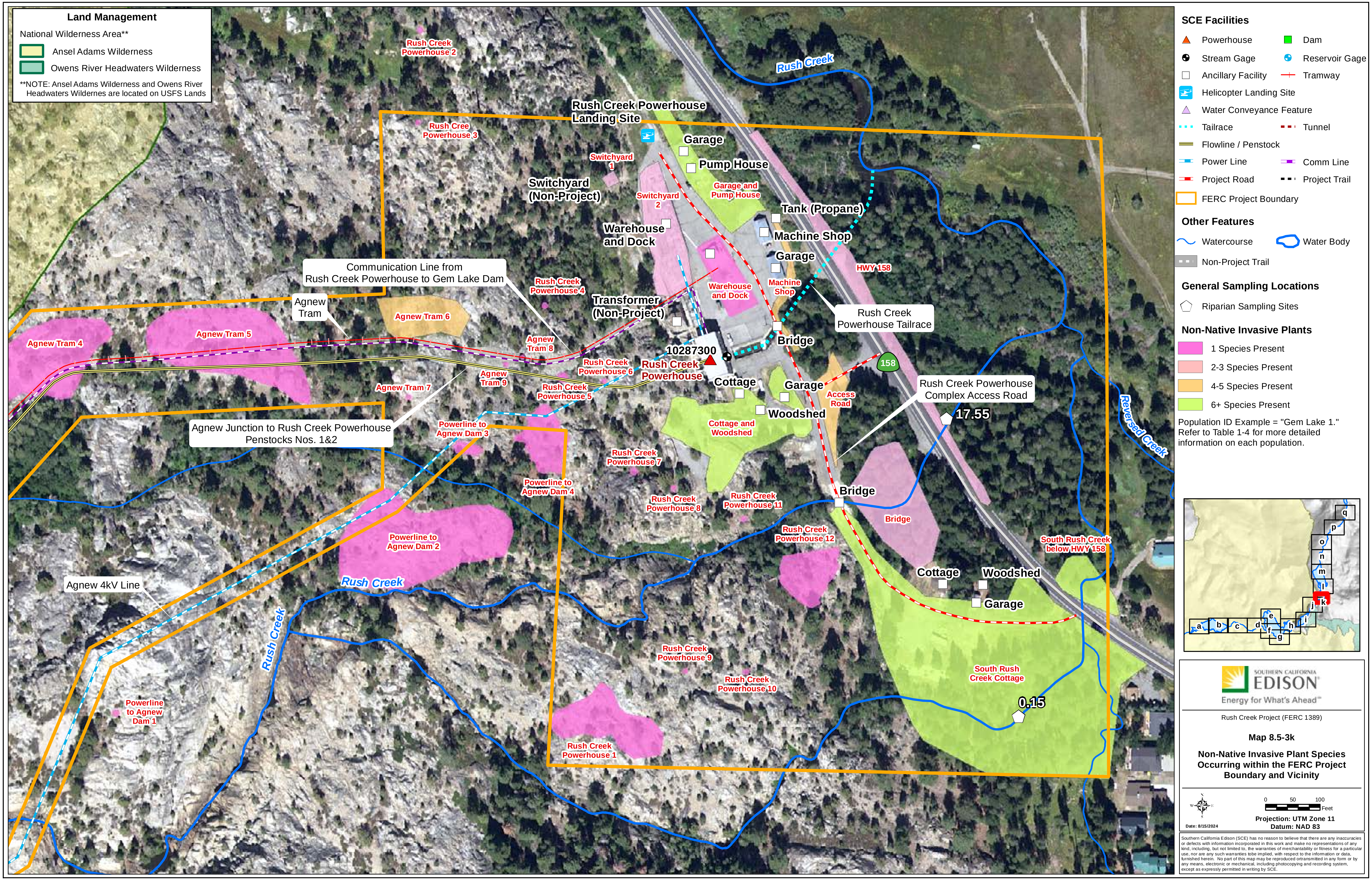
0 50 100 200 Feet

Date: 5/23/2024

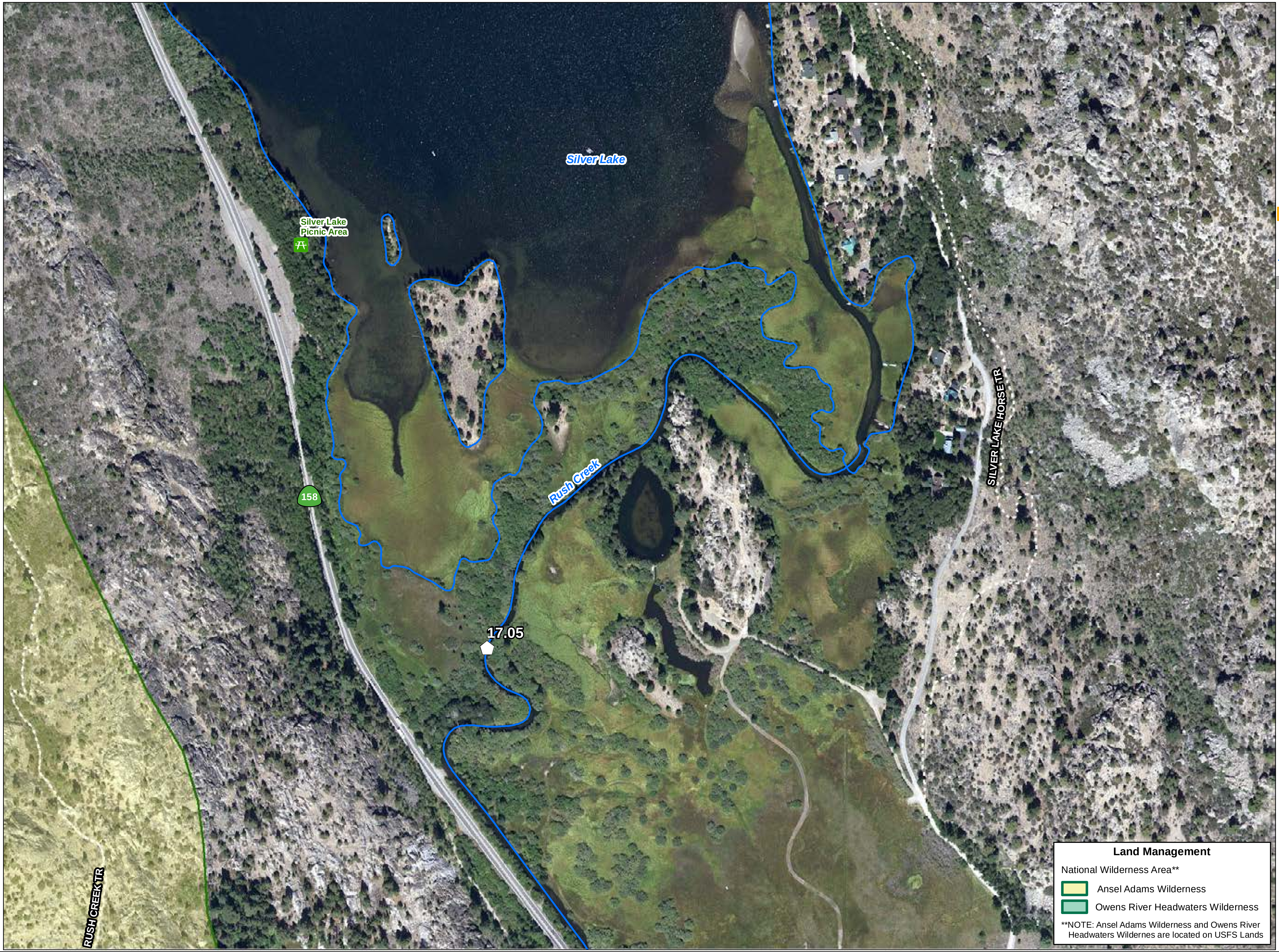
**Projection: UTM Zone 11**
**Datum: NAD 83**



C:\GIS\237800343\map\Rush Creek\TerrestrialMaps\SCE_RUSH_CREEK_NNIPlants_17i11i_03.mxd




C:\GIS\237800343\map\Rush Creek\TerrestrialMaps\SCE_RUSH_CREEK_NNIPlants_PHSiteDetails_17i11i_01.mxd




**SCE Facilities**

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

**Other Features**

- Watercourse
- Water Body
- Non-Project Trail

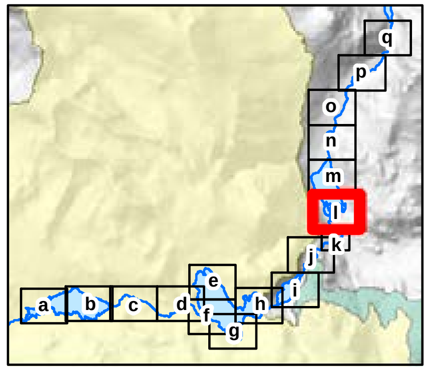
**General Sampling Locations**

- Riparian Sampling Sites

**Non-Native Invasive Plants**

- 1 Species Present
- 2-3 Species Present
- 4-5 Species Present
- 6+ Species Present

Population ID Example = "Gem Lake 1."
Refer to Table 1-4 for more detailed information on each population.




SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead

Rush Creek Project (FERC 1389)

**Map 8.5-3l**

**Non-Native Invasive Plant Species Occurring within the FERC Project Boundary and Vicinity**

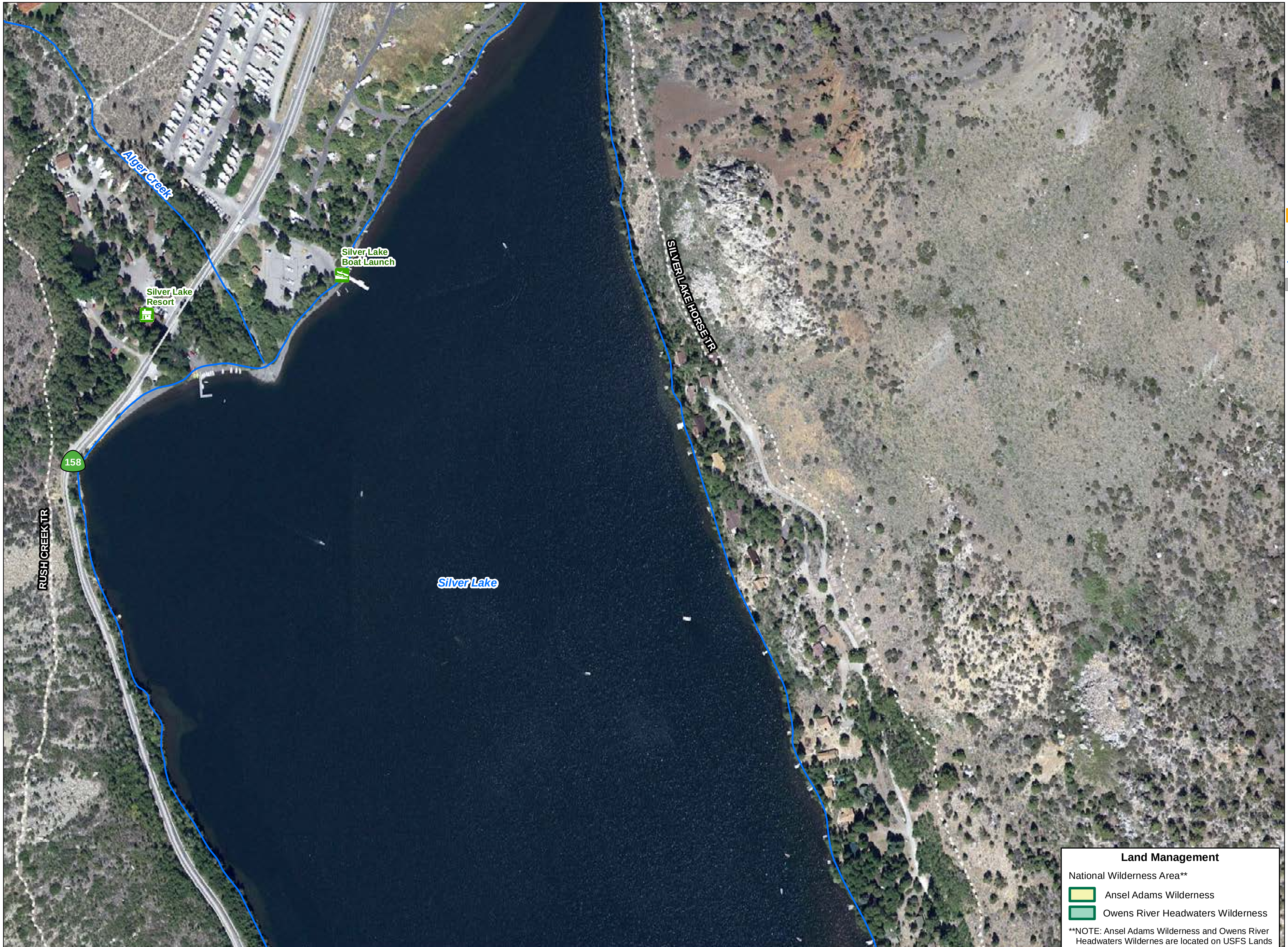
0 50 100 200 Feet

**Date: 5/23/2024**

**Projection: UTM Zone 11**
**Datum: NAD 83**



C:\GIS\237800343\map\Rush Creek\TerrestrialMaps\SCE_RUSH_CREEK_NNIPlants_17i11i_03.mxd




**Land Management**

National Wilderness Area**

- Ansel Adams Wilderness
- Owens River Headwaters Wilderness

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

### SCE Facilities

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

### Other Features

- Watercourse
- Water Body
- Non-Project Trail

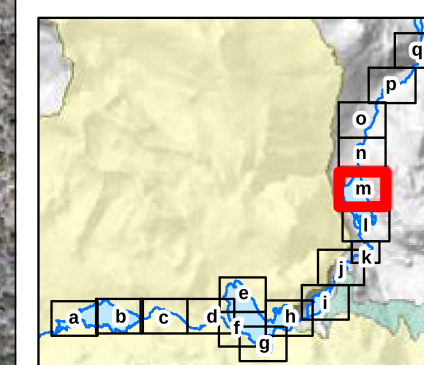
### General Sampling Locations

- Riparian Sampling Sites

### Non-Native Invasive Plants

- 1 Species Present
- 2-3 Species Present
- 4-5 Species Present
- 6+ Species Present

Population ID Example = "Gem Lake 1." Refer to Table 1-4 for more detailed information on each population.




SOUTHERN CALIFORNIA EDISON

Energy for What's Ahead℠

Rush Creek Project (FERC 1389)

**Map 8.5-3m**

**Non-Native Invasive Plant Species Occurring within the FERC Project Boundary and Vicinity**

N W E S

0 50 100 200 Feet

Date: 5/23/2024

**Projection: UTM Zone 11**
**Datum: NAD 83**



C:\GIS\237800343\map\Rush Creek\TerrestrialMaps\SCE_RUSH_CREEK_NNIPlants_17i11i_03.mxd


**Land Management**

National Wilderness Area**

- Ansel Adams Wilderness
- Owens River Headwaters Wilderness

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

**SCE Facilities**

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

**Other Features**

- Watercourse
- Water Body
- Non-Project Trail

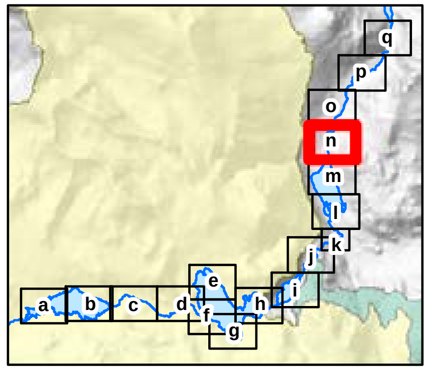
**General Sampling Locations**

- Riparian Sampling Sites

**Non-Native Invasive Plants**

- 1 Species Present
- 2-3 Species Present
- 4-5 Species Present
- 6+ Species Present

Population ID Example = "Gem Lake 1." Refer to Table 1-4 for more detailed information on each population.




SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead℠

Rush Creek Project (FERC 1389)

**Map 8.5-3n**

**Non-Native Invasive Plant Species Occurring within the FERC Project Boundary and Vicinity**

0 50 100 200 Feet

Date: 5/23/2024

**Projection: UTM Zone 11**
**Datum: NAD 83**



C:\GIS\237800343\map\Rush Creek\TerrestrialMaps\SCE_RUSH_CREEK_NNIPlants_17i11i_03.mxd


### Land Management

National Wilderness Area**

- Ansel Adams Wilderness
- Owens River Headwaters Wilderness

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

### SCE Facilities

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

### Other Features

- Watercourse
- Water Body
- Non-Project Trail

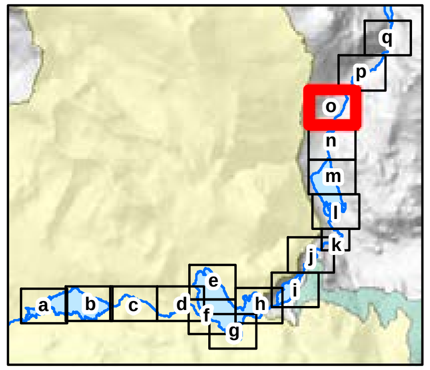
### General Sampling Locations

- Riparian Sampling Sites

### Non-Native Invasive Plants

- 1 Species Present
- 2-3 Species Present
- 4-5 Species Present
- 6+ Species Present

Population ID Example = "Gem Lake 1."
Refer to Table 1-4 for more detailed information on each population.




SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead℠

Rush Creek Project (FERC 1389)

**Map 8.5-3o**

**Non-Native Invasive Plant Species Occurring within the FERC Project Boundary and Vicinity**

N S W E

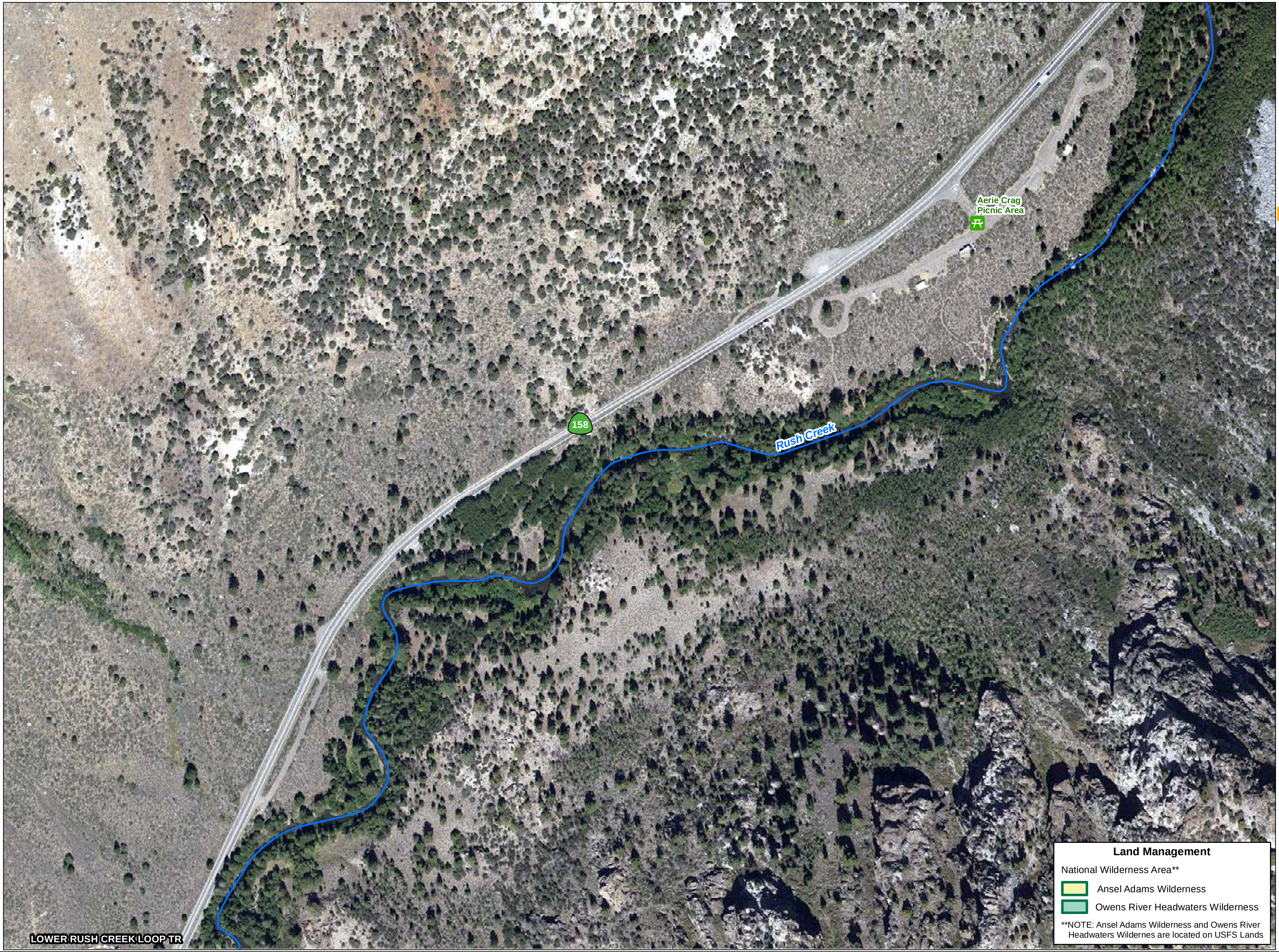
0 50 100 200 Feet

Date: 5/23/2024

**Projection: UTM Zone 11**
**Datum: NAD 83**



C:\GIS\237800343\map\Rush Creek\TerrestrialMaps\SCE_RUSH_CREEK_NNIPlants_17i11i_03.mxd




**SCE Facilities**

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

**Other Features**

Watercourse
Water Body
Non-Project Trail

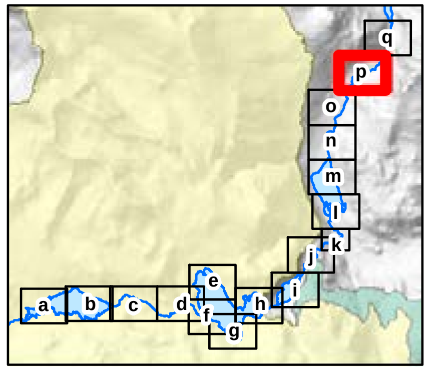
**General Sampling Locations**

Riparian Sampling Sites

**Non-Native Invasive Plants**

1 Species Present
2-3 Species Present
4-5 Species Present
6+ Species Present

Population ID Example = "Gem Lake 1." Refer to Table 1-4 for more detailed information on each population.




SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead℠

Rush Creek Project (FERC 1389)

**Map 8.5-3p**

**Non-Native Invasive Plant Species Occurring within the FERC Project Boundary and Vicinity**

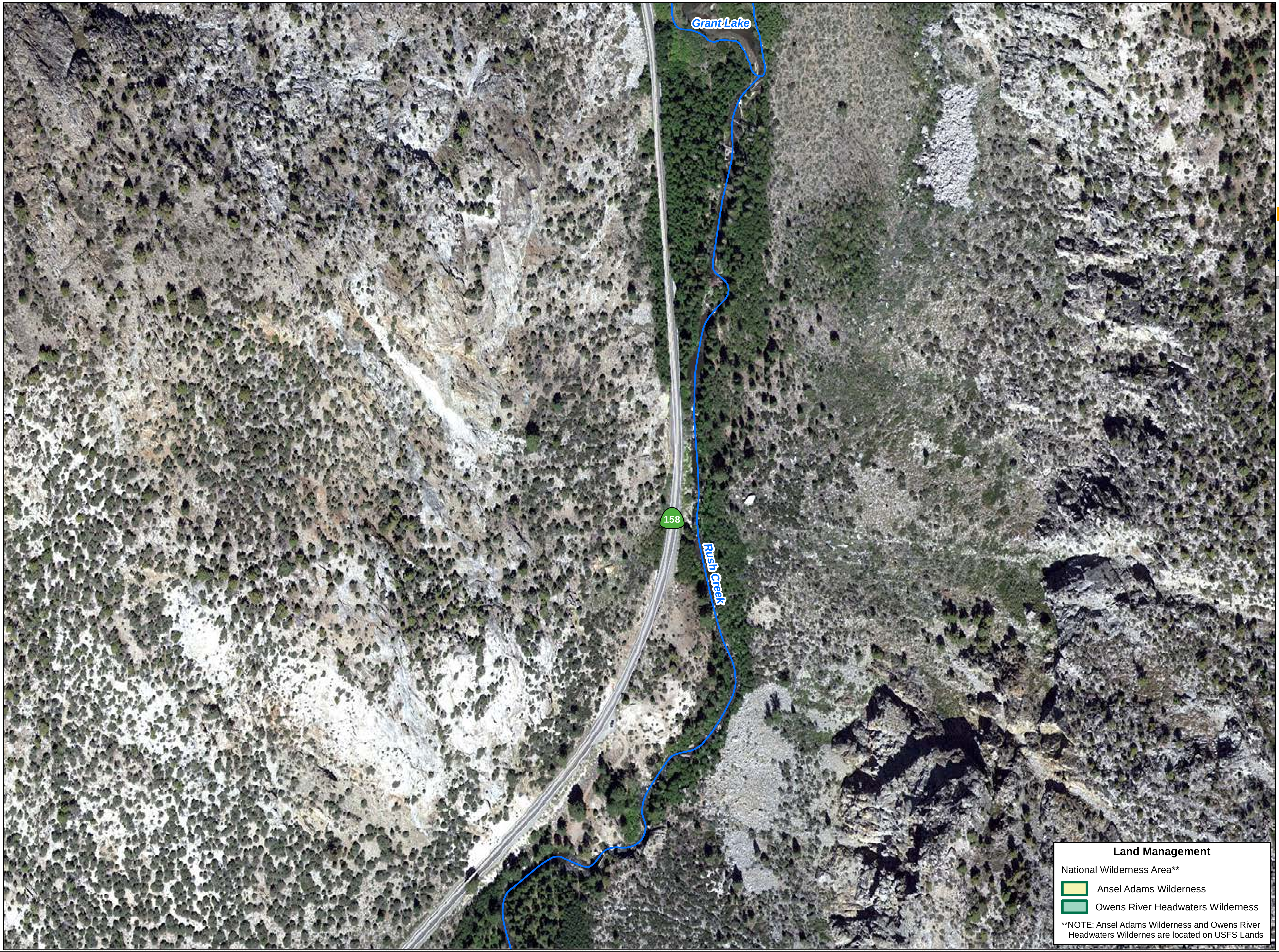
Date: 5/23/2024

0 50 100 200 Feet

**Projection: UTM Zone 11**
**Datum: NAD 83**



C:\GIS\237800343\map\Rush Creek\TerrestrialMaps\SCE_RUSH_CREEK_NNIPlants_17i11i_03.mxd




**SCE Facilities**

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

**Other Features**

- Watercourse
- Water Body
- Non-Project Trail

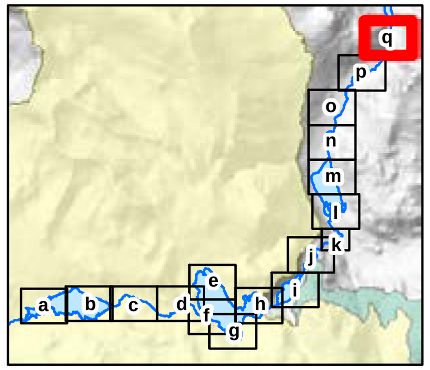
**General Sampling Locations**

- Riparian Sampling Sites

**Non-Native Invasive Plants**

- 1 Species Present
- 2-3 Species Present
- 4-5 Species Present
- 6+ Species Present

Population ID Example = "Gem Lake 1."
Refer to Table 1-4 for more detailed information on each population.




SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead℠

Rush Creek Project (FERC 1389)

**Map 8.5-3q**

**Non-Native Invasive Plant Species Occurring within the FERC Project Boundary and Vicinity**

0 50 100 200 Feet

**Date: 5/23/2024**

**Projection: UTM Zone 11**
**Datum: NAD 83**



C:\GIS\237800343\map\Rush Creek\TerrestrialMaps\SCE_RUSH_CREEK_NNIPlants_17i11i_03.mxd

# CONFIDENTIAL INFORMATION

The following map is being withheld from public disclosure in accordance with applicable regulations. It contains details on the locations of special-status biological resources and qualifies as Confidential Information (18 Code of Federal Regulations § 385.1112). Disclosure of such information could be harmful to these resources. To further understand the Federal Energy Regulatory Commission's regulations regarding confidential filings, visit: https://www.ferc.gov/foia.

**Map 8.5-4 Special-Status Terrestrial Wildlife Species within the FERC Project Boundary or within 1 Mile of the FERC Project Boundary (Confidential)**

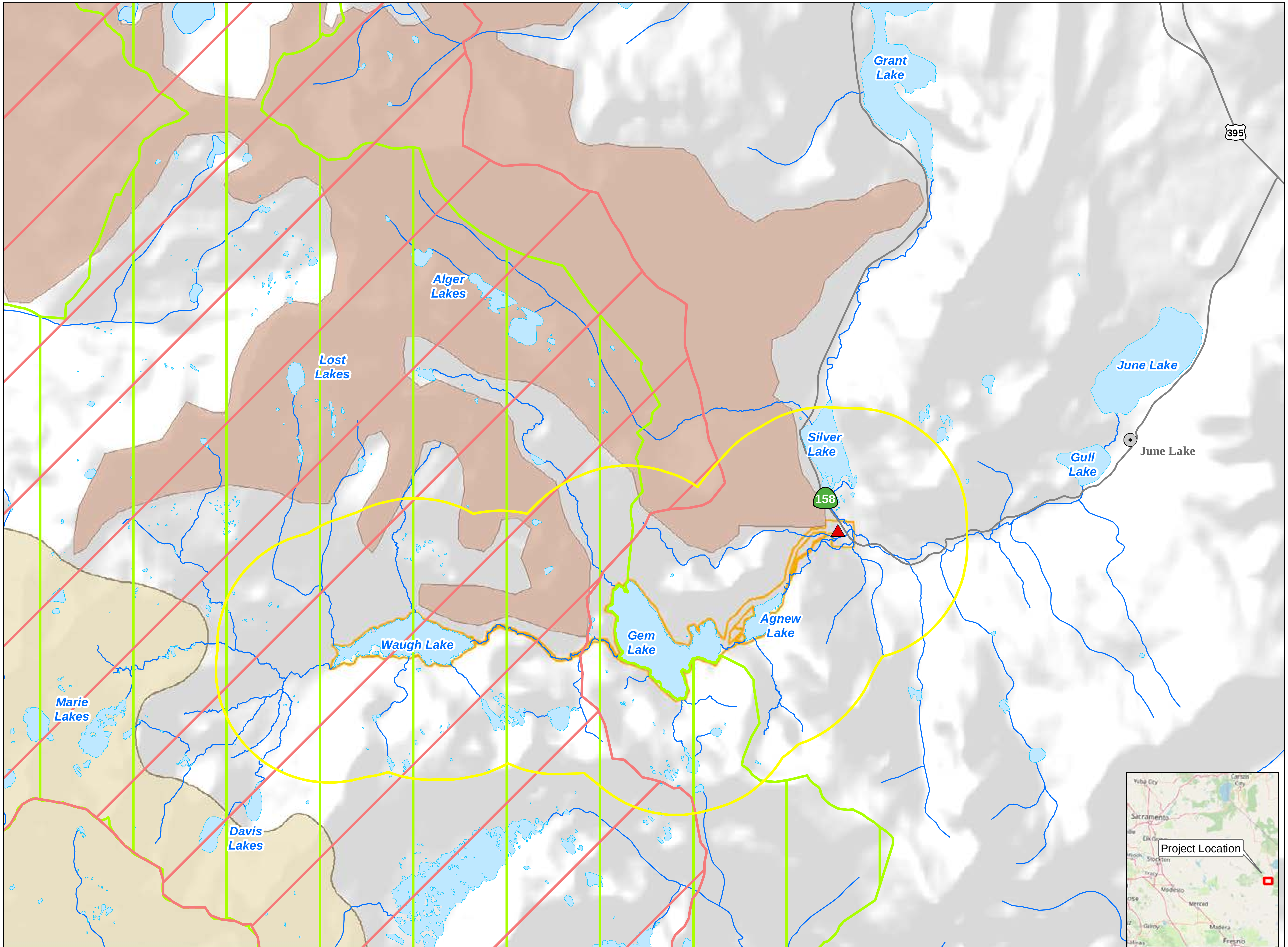
Map 8.5-4 will not be distributed to the general public. Documents containing Confidential Information may be requested by entities and organizations with jurisdiction over these resources. To request copies, please contact Matthew Woodhall, SCE Relicensing Project Manager at (909) 362-1764 or matthew.woodhall@sce.com.

# CONFIDENTIAL INFORMATION

The following map is being withheld from public disclosure in accordance with applicable regulations. It contains details on the locations of special-status biological resources and qualifies as Confidential Information (18 Code of Federal Regulations § 385.1112). Disclosure of such information could be harmful to these resources. To further understand the Federal Energy Regulatory Commission's regulations regarding confidential filings, visit: https://www.ferc.gov/foia.

**Map 8.5-5 Special-Status Aquatic Amphibians within the FERC Project Boundary or within 1 Mile of the FERC Project Boundary (Confidential)**

Map 8.5-5 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.




**SCE Facilities**

Powerhouse

**Other Features**

Highway

River/Stream

Lake/Reservoir

FERC Boundary

1-Mile FERC Boundary Buffer

**Final Critical Habitat***

Sierra Nevada Yellow-Legged Frog[1]

Yosemite Toad

Sierra Nevada Bighorn Sheep

*Source: U.S. Fish and Wildlife Service (2016)

[1]The U.S. Fish and Wildlife Service Critical Habitat data layer for Sierra Nevada Yellow-Legged Frog has been modified to exclude Gem Lake, consistent with the Final Rule (FR, Vol. 81, No. 16, pp. 59072)

**Recently Designated Sierra Nevada Bighorn Sheep Herd Units**

Cathedral Range Herd Unit

Rush Creek Project (FERC 1389)

**Map 8.5-6**

**Location of Critical Habitat and Sierra Nevada Bighorn Sheep Herd Units within the FERC Project Boundary or within 1 Mile of the Boundary**

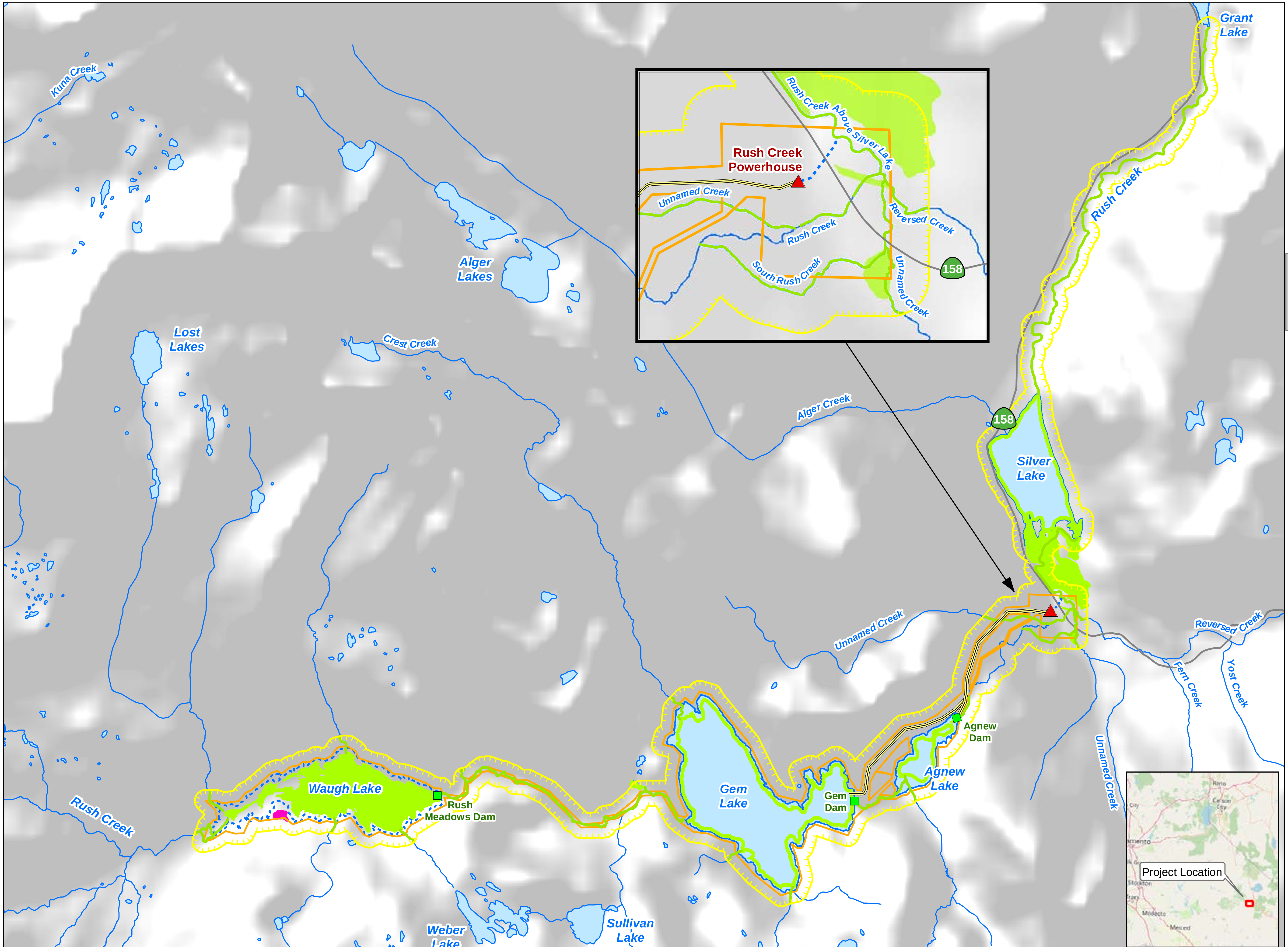
0 0.5 1 Miles

Date: 5/7/2024

**Projection: UTM Zone 11**
**Datum: NAD 83**



C:\GIS\237800343\map\Rush Creek\TerrestrialMaps\SCE_RUSH_CREEK_Critical_Habitat_1mile_Buffer_17i11i_04.mxd




**SCE Facilities**

- Dam
- Powerhouse
- Flowline / Penstock
- Tailrace

**Other Features**

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

**Field Assessed SNYLF Habitat***

- Potential Breeding Habitat
- Potential Non-breeding Habitat
- Study Area Boundary

* Refer to Table AQ 7-3 for a complete list of PCEs by feature

SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead℠

Rush Creek Project (FERC 1389)

**Map 8.5-7**

**Potential SNYLF Habitat within the Study Area - Overview Map**

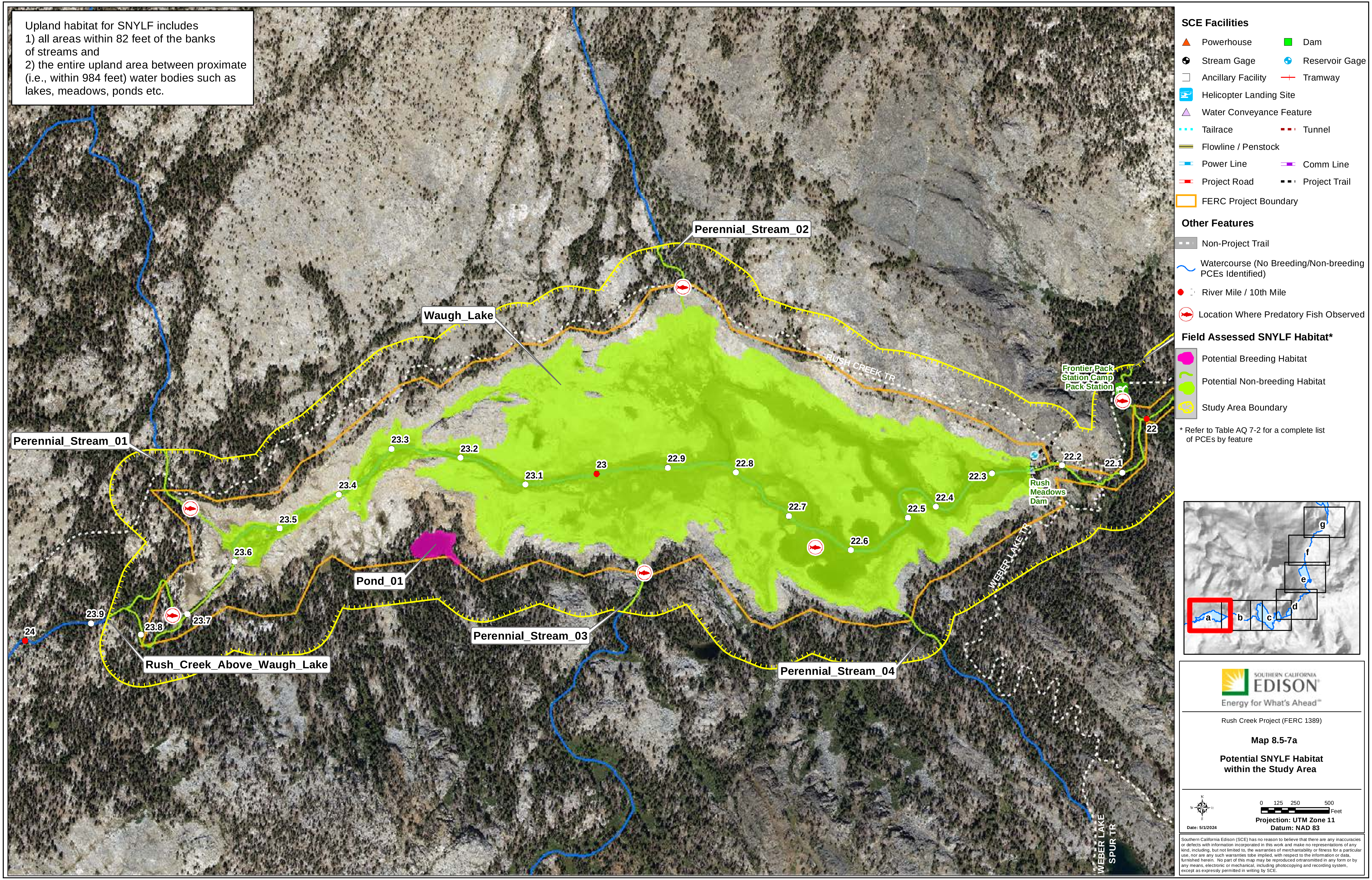
0 0.25 0.5 Miles

Date: 5/1/2024

**Projection: UTM Zone 11**
**Datum: NAD 83**

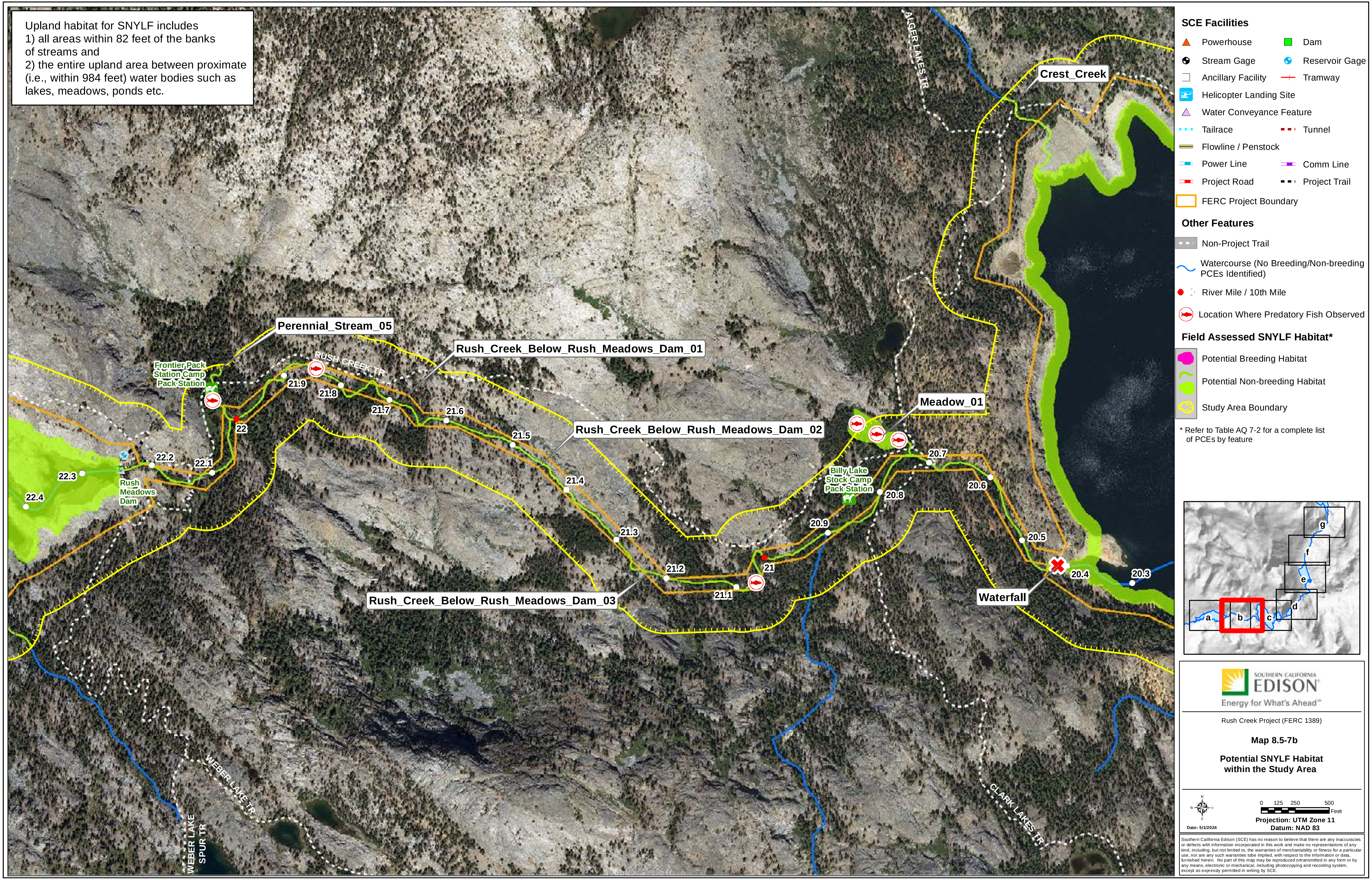


C:\GIS\237800343\map\Rush Creek\AquaticMaps\SCE_RUSH_CREEK_AQ7_PotnHab_SNYLF_Overview_17i11i_05.mxd






C:\GIS\237800343\map\Rush Creek\AquaticMaps\SCE_RUSH_CREEK_AQ7_PotnHab_SNYLF_17i11i_05.mxd




C:\GIS\237800343\map\Rush Creek\AquaticMaps\SCE_RUSH_CREEK_AQ7_PotnHab_SNYLF_17i11i_05.mxd


**SCE Facilities**

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

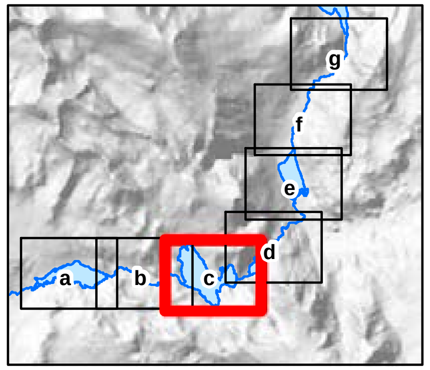
**Other Features**

- Non-Project Trail
- Watercourse (No Breeding/Non-breeding PCEs Identified)
- River Mile / 10th Mile
- Location Where Predatory Fish Observed

**Field Assessed SNYLF Habitat***

- Potential Breeding Habitat
- Potential Non-breeding Habitat
- Study Area Boundary

* Refer to Table AQ 7-2 for a complete list of PCEs by feature




SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead℠

Rush Creek Project (FERC 1389)

**Map 8.5-7c**

**Potential SNYLF Habitat within the Study Area**

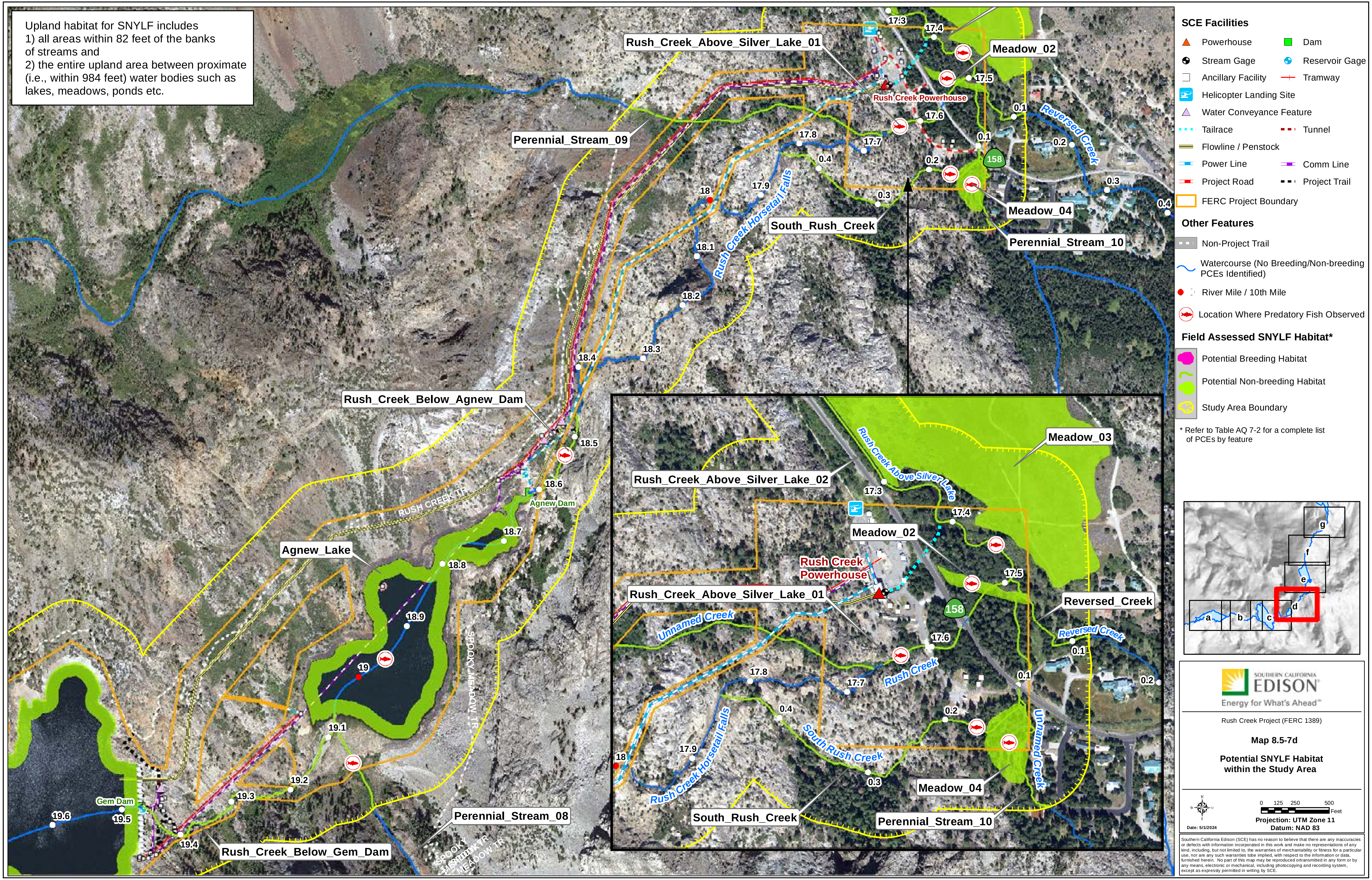
Date: 5/1/2024

0 125 250 500 Feet

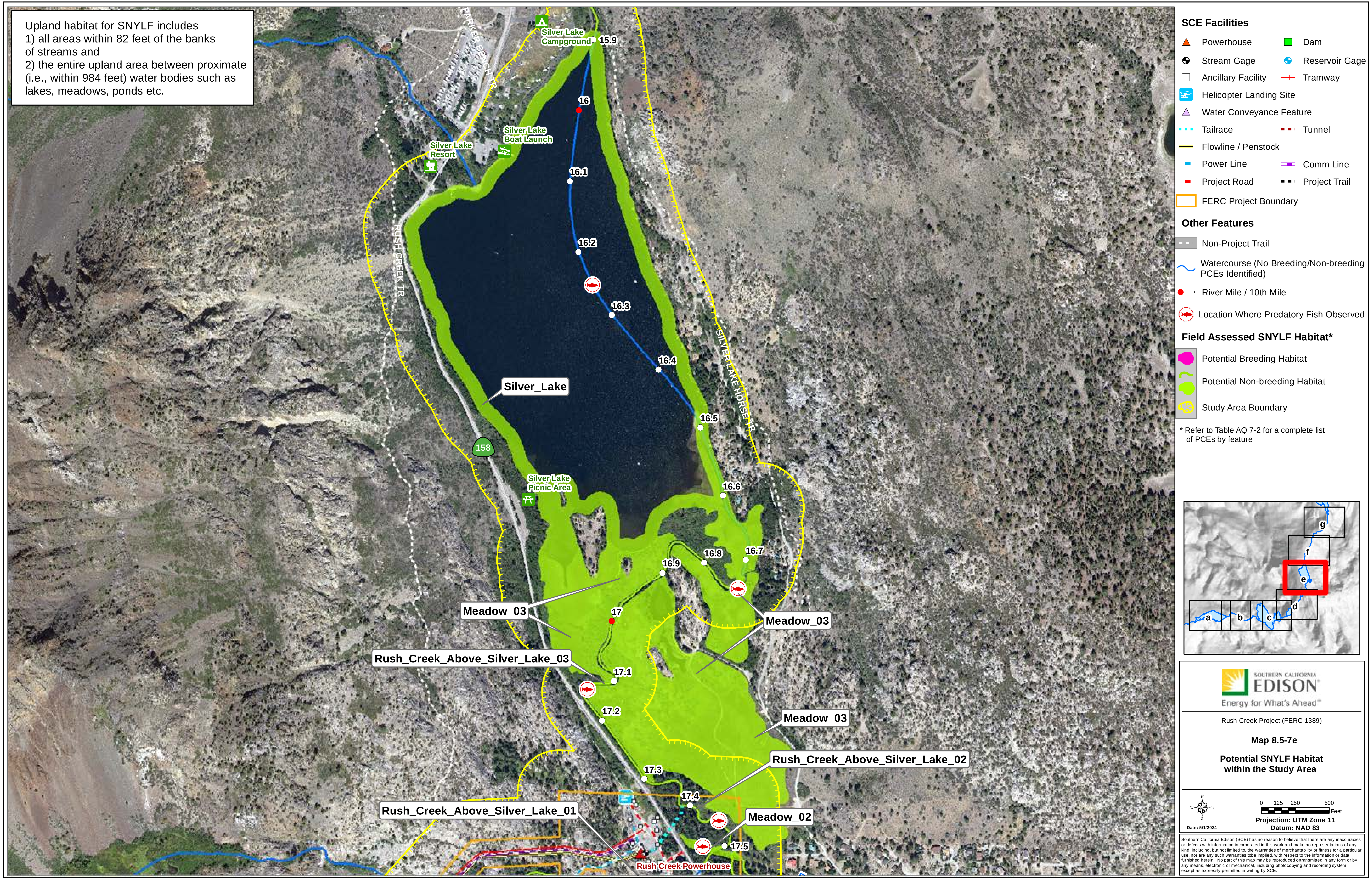
**Projection: UTM Zone 11**
**Datum: NAD 83**



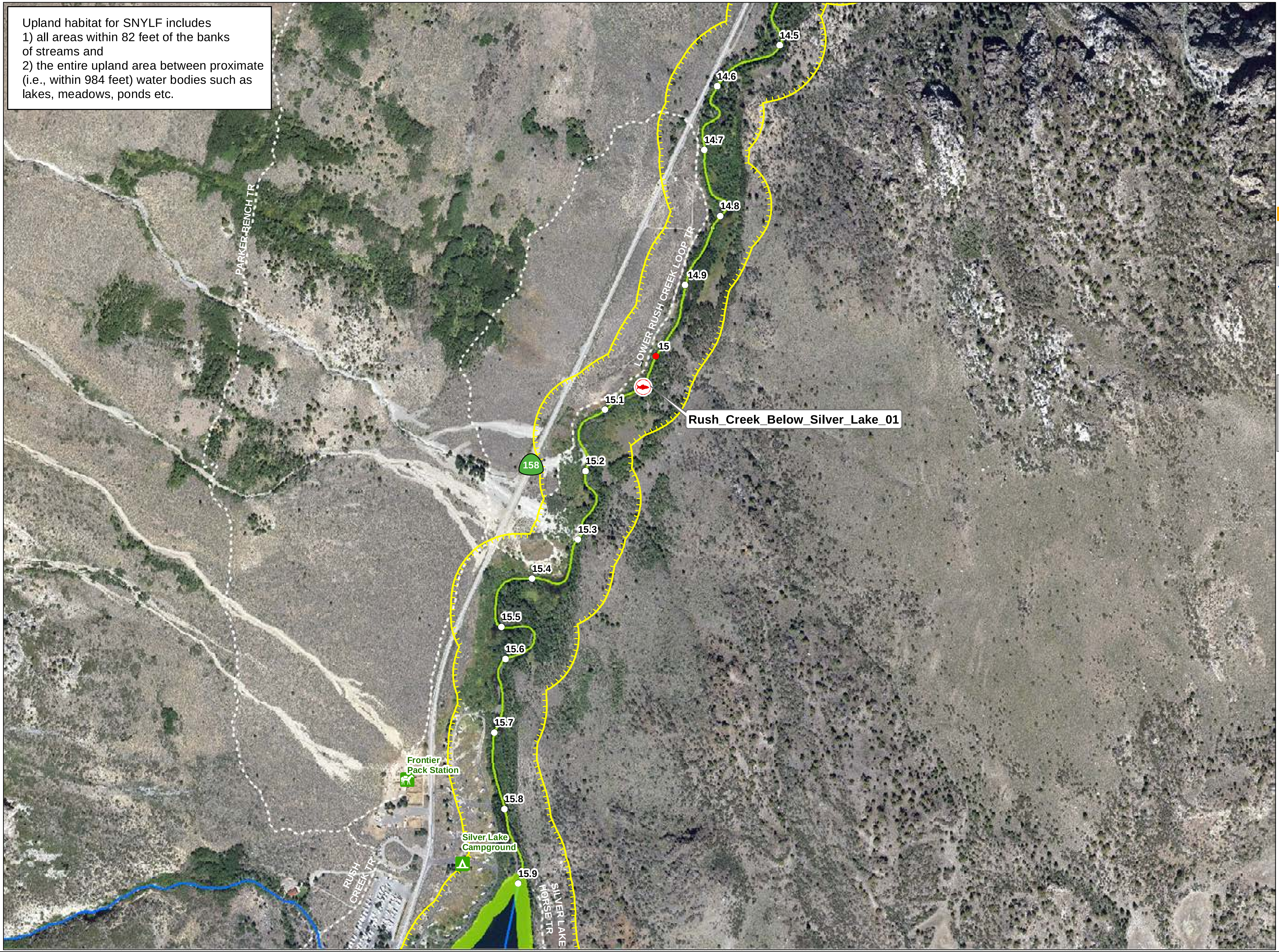
C:\GIS\237800343\map\Rush Creek\AquaticMaps\SCE_RUSH_CREEK_AQ7_PotnHab_SNYLF_17i11i_05.mxd




C:\GIS\237800343\map\Rush Creek\AquaticMaps\SCE_RUSH_CREEK_AQ7_PotnHab_SNYLF_17i11i_05.mxd




C:\GIS\237800343\map\Rush Creek\AquaticMaps\SCE_RUSH_CREEK_AQ7_PotnHab_SNYLF_17i11i_05.mxd




## SCE Facilities

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

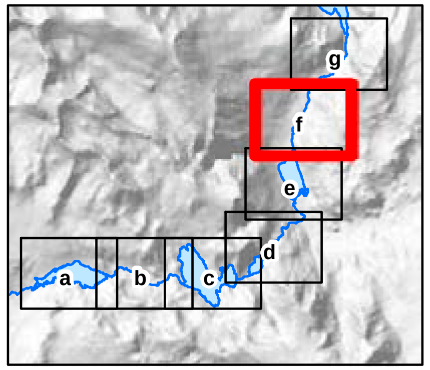
## Other Features

- Non-Project Trail
- Watercourse (No Breeding/Non-breeding PCEs Identified)
- River Mile / 10th Mile
- Location Where Predatory Fish Observed

## Field Assessed SNYLF Habitat*

- Potential Breeding Habitat
- Potential Non-breeding Habitat
- Study Area Boundary

* Refer to Table AQ 7-2 for a complete list of PCEs by feature




SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead℠

Rush Creek Project (FERC 1389)

**Map 8.5-7f**

**Potential SNYLF Habitat within the Study Area**

Date: 5/1/2024

0 125 250 500 Feet

**Projection: UTM Zone 11**
**Datum: NAD 83**



C:\GIS\237800343\map\Rush Creek\AquaticMaps\SCE_RUSH_CREEK_AQ7_PotnHab_SNYLF_17i11i_05.mxd


## SCE Facilities

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

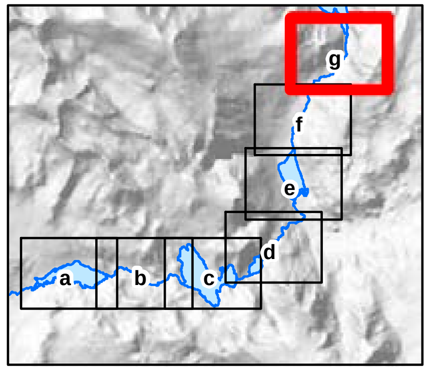
## Other Features

- Non-Project Trail
- Watercourse (No Breeding/Non-breeding PCEs Identified)
- River Mile / 10th Mile
- Location Where Predatory Fish Observed

## Field Assessed SNYLF Habitat*

- Potential Breeding Habitat
- Potential Non-breeding Habitat
- Study Area Boundary

* Refer to Table AQ 7-2 for a complete list of PCEs by feature




SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead℠

Rush Creek Project (FERC 1389)

**Map 8.5-7g**

**Potential SNYLF Habitat within the Study Area**

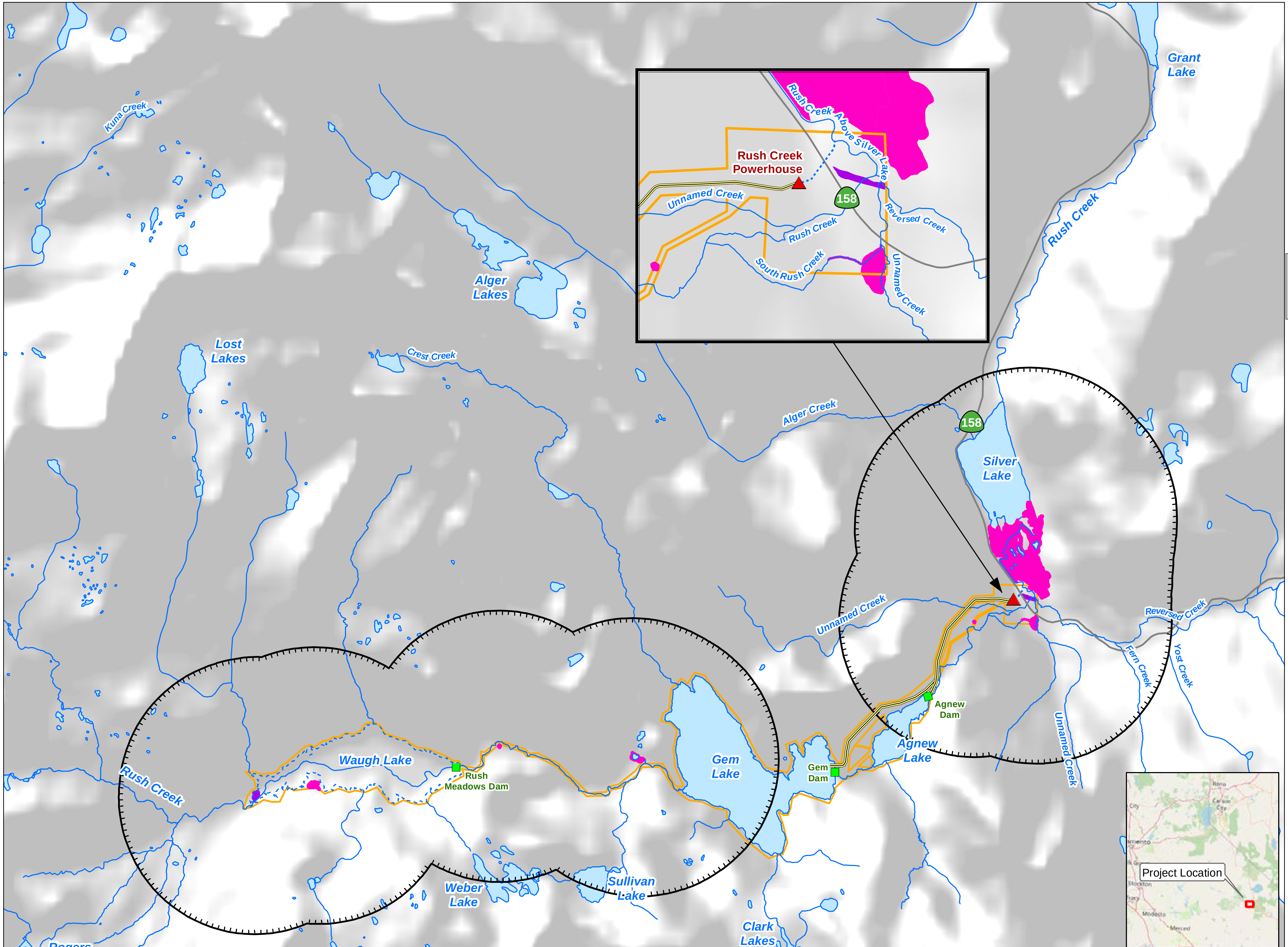
0 125 250 500 Feet

**Projection: UTM Zone 11**
**Datum: NAD 83**

**Date: 5/1/2024**



C:\GIS\237800343\map\Rush Creek\AquaticMaps\SCE_RUSH_CREEK_AQ7_PotnHab_SNYLF_17i11i_05.mxd




**SCE Facilities**

- Dam
- Powerhouse
- Flowline / Penstock
- Tailrace

**Other Features**

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

**Field Assessed YT Habitat***

- Potential Aquatic Breeding Habitat
- Potential Non-breeding Meadows
- Potential Upland Habitat

* Refer to Table AQ 7-6 for a complete list of PCEs by feature

Southern California EDISON
Energy for What's Ahead

Rush Creek Project (FERC 1389)

**Map 8.5-8**

**Potential YT Habitat within the Study Area - Overview Map**

N W E S

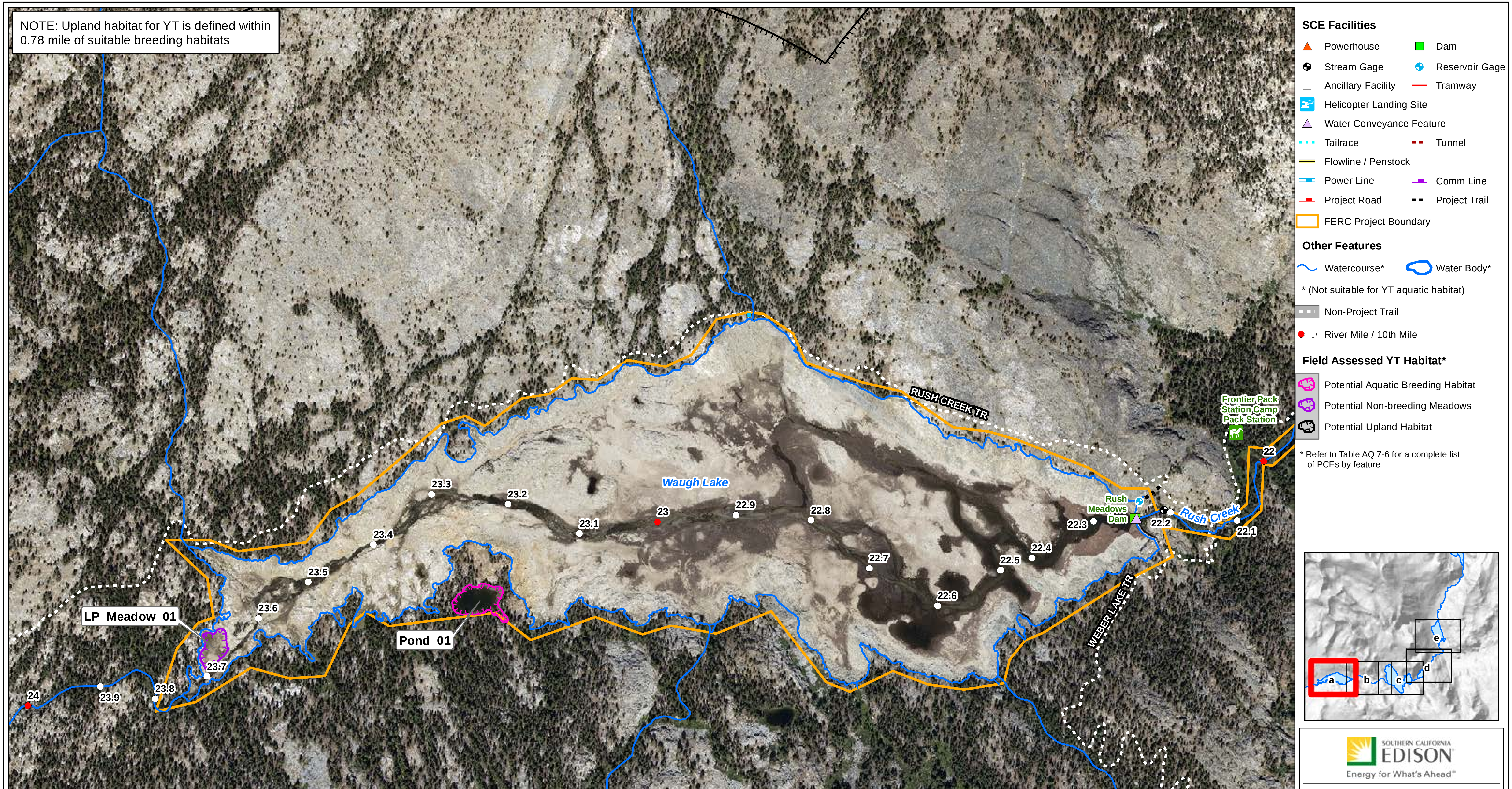
0 0.25 0.5 Miles

Date: 5/2/2024

**Projection: UTM Zone 11**
**Datum: NAD 83**



C:\GIS\237800343\map\Rush Creek\AquaticMaps\SCE_RUSH_CREEK_AQ7_PotnHab_YT_Overview_17i11i_04.mxd



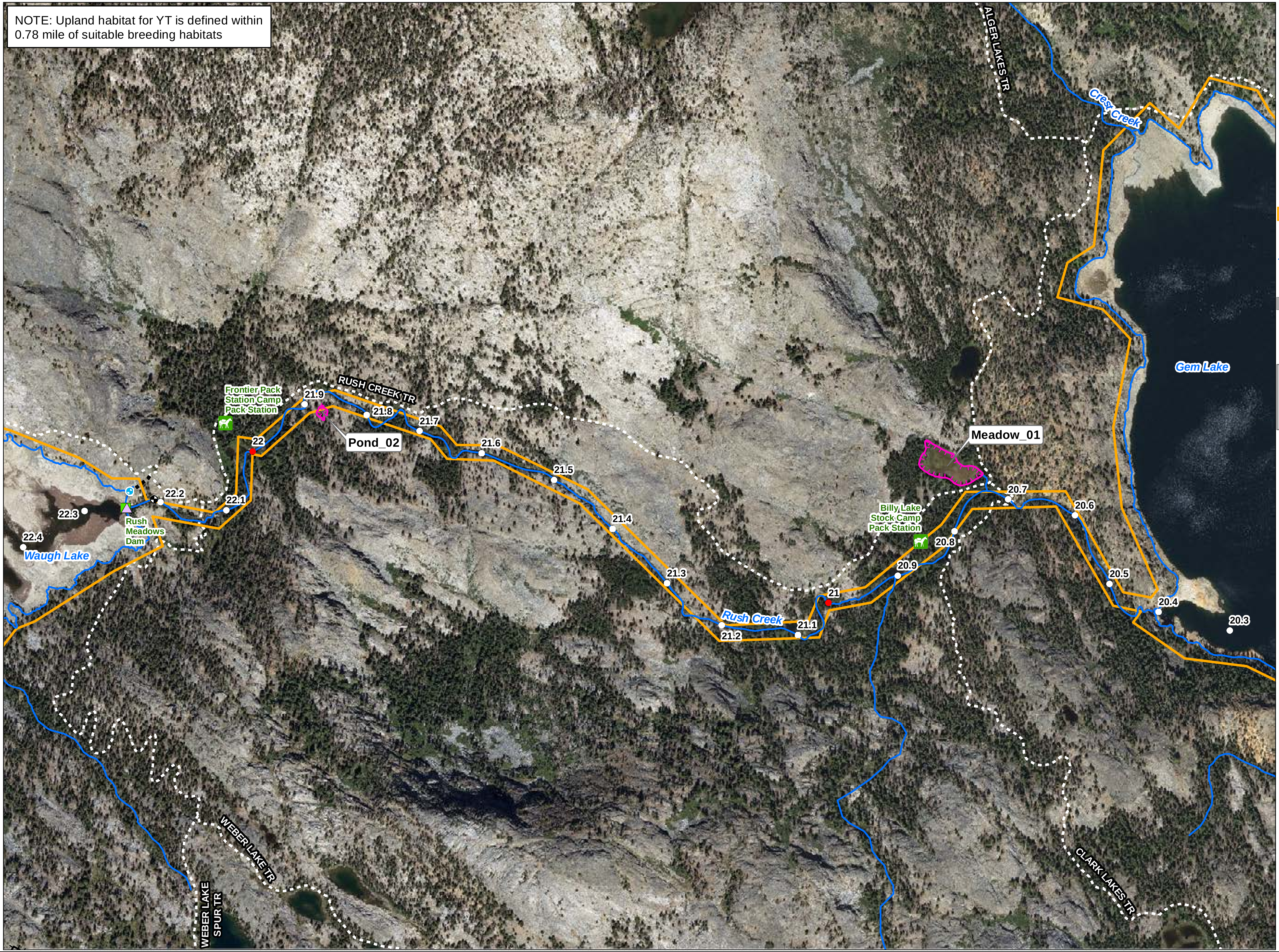

Rush Creek Project (FERC 1389)

**Map 8.5-8a**

**Potential YT Habitat within the Study Area**



C:\GIS\237800343\map\Rush Creek\AquaticMaps\SCE_RUSH_CREEK_AQ7_PotnHab_YT_17i11i_04.mxd




**SCE Facilities**

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

**Other Features**

- Watercourse*
- Water Body*

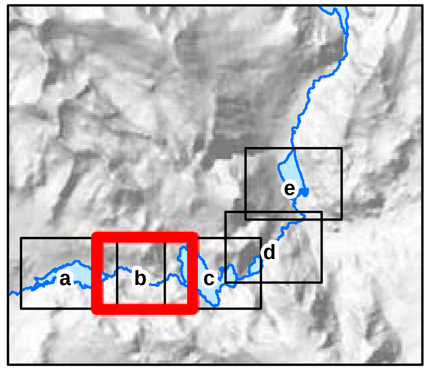
* (Not suitable for YT aquatic habitat)

- Non-Project Trail
- River Mile / 10th Mile

**Field Assessed YT Habitat***

- Potential Aquatic Breeding Habitat
- Potential Non-breeding Meadows
- Potential Upland Habitat

* Refer to Table AQ 7-6 for a complete list of PCEs by feature




SOUTHERN CALIFORNIA EDISON

Energy for What's Ahead℠

Rush Creek Project (FERC 1389)

**Map 8.5-8b**

**Potential YT Habitat within the Study Area**

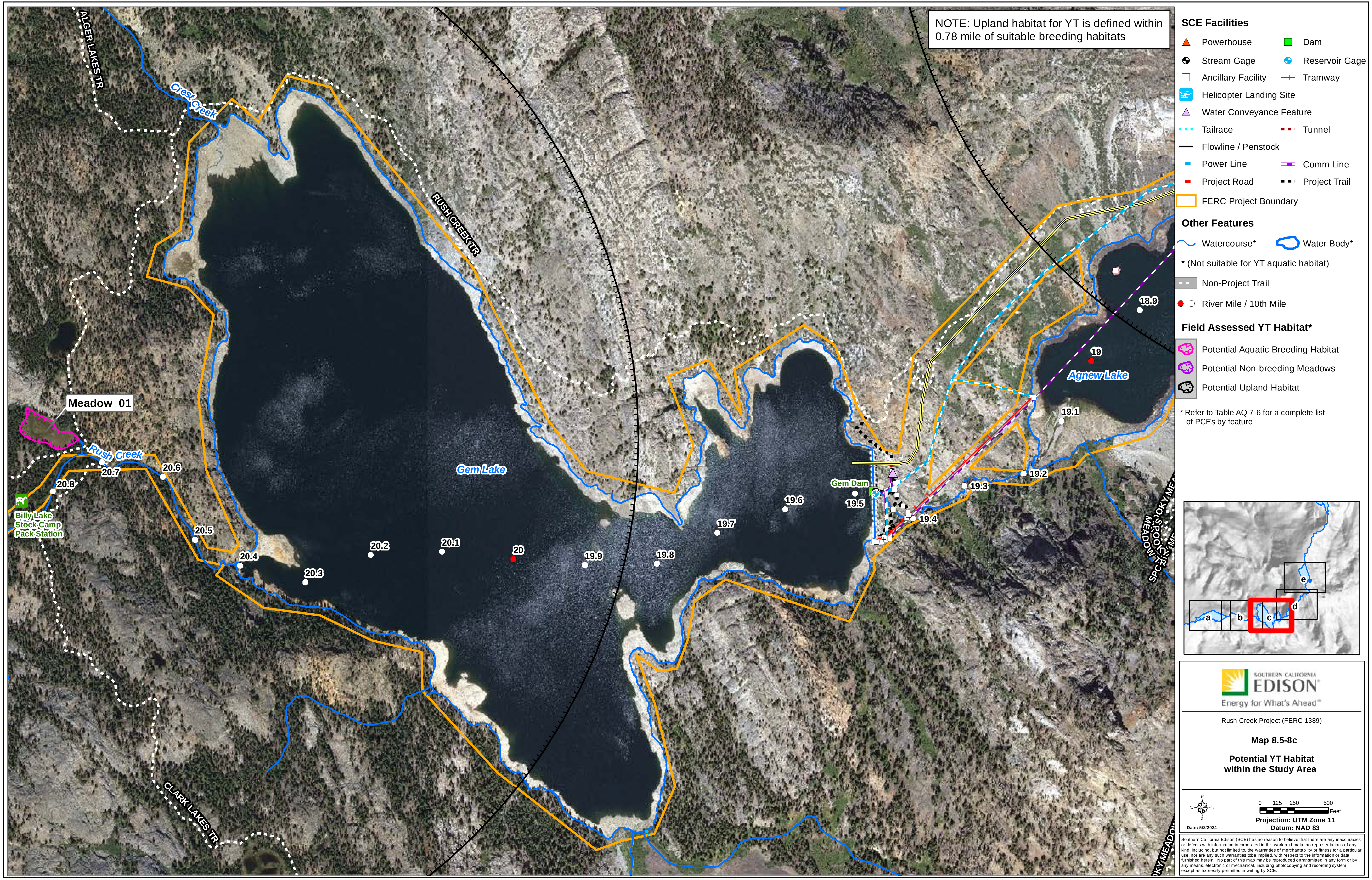
Date: 5/2/2024

0 125 250 500 Feet

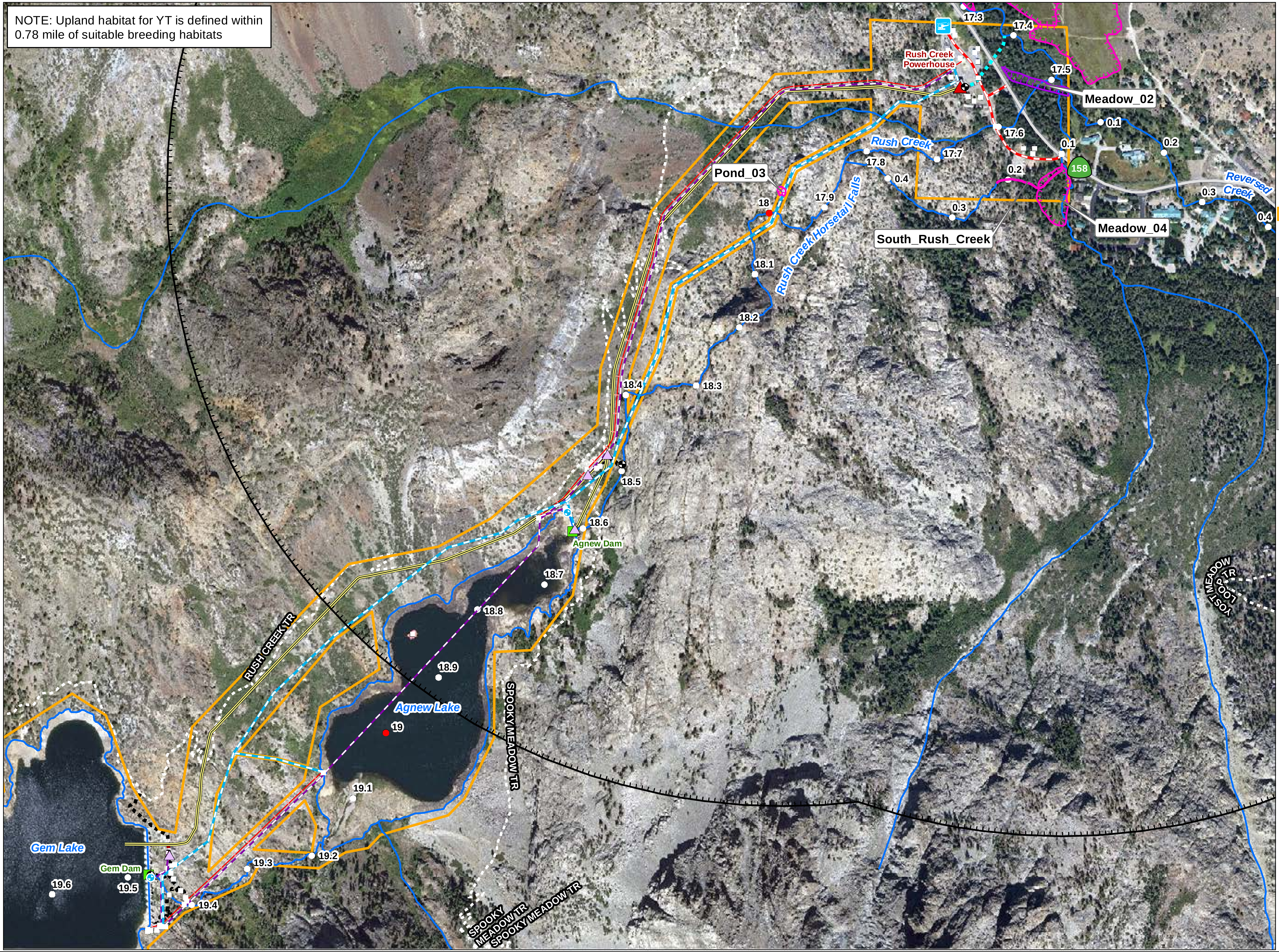
Projection: UTM Zone 11
Datum: NAD 83



C:\GIS\237800343\map\Rush Creek\AquaticMaps\SCE_RUSH_CREEK_AQ7_PotnHab_YT_17i11i_04.mxd




C:\GIS\237800343\map\Rush Creek\AquaticMaps\SCE_RUSH_CREEK_AQ7_PotnHab_YT_17i11i_04.mxd




## SCE Facilities

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

## Other Features

- Watercourse*
- Water Body*

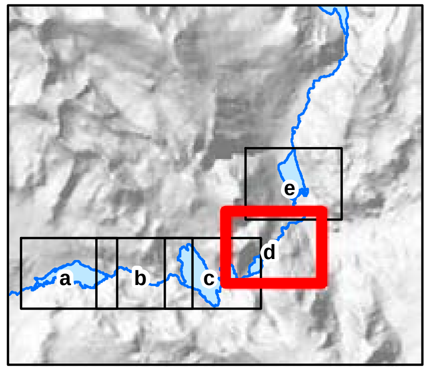
* (Not suitable for YT aquatic habitat)

- Non-Project Trail
- River Mile / 10th Mile

## Field Assessed YT Habitat*

- Potential Aquatic Breeding Habitat
- Potential Non-breeding Meadows
- Potential Upland Habitat

* Refer to Table AQ 7-6 for a complete list of PCEs by feature




SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead™

Rush Creek Project (FERC 1389)

**Map 8.5-8d**

**Potential YT Habitat within the Study Area**

N W E S

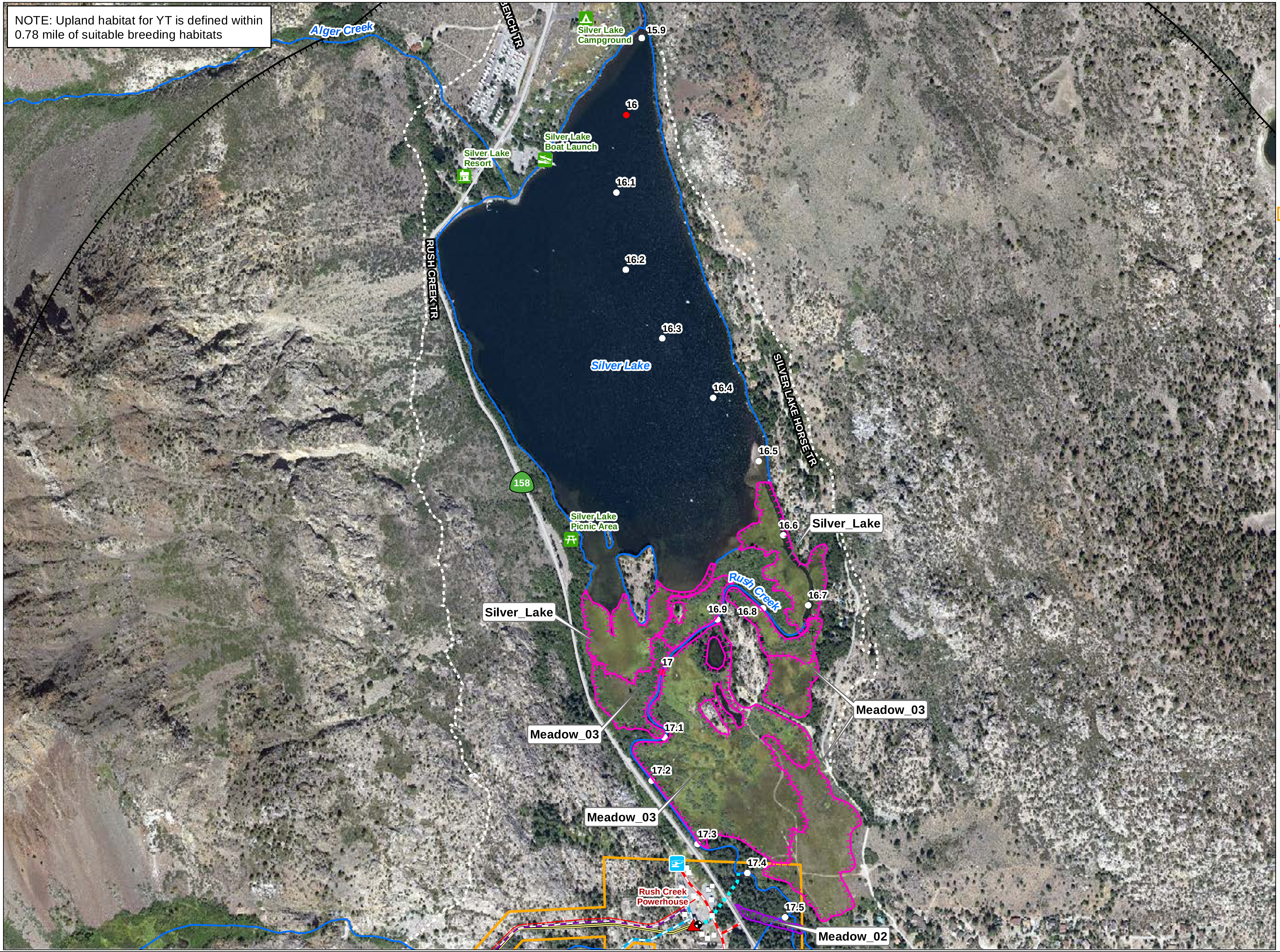
0 125 250 500 Feet

Date: 5/2/2024

**Projection: UTM Zone 11**
**Datum: NAD 83**



C:\GIS\237800343\map\Rush Creek\AquaticMaps\SCE_RUSH_CREEK_AQ7_PotnHab_YT_17i11i_04.mxd




## SCE Facilities

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

## Other Features

- Watercourse*
- Water Body*

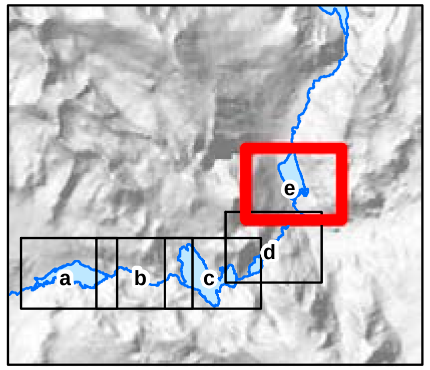
* (Not suitable for YT aquatic habitat)

- Non-Project Trail
- River Mile / 10th Mile

## Field Assessed YT Habitat*

- Potential Aquatic Breeding Habitat
- Potential Non-breeding Meadows
- Potential Upland Habitat

* Refer to Table AQ 7-6 for a complete list of PCEs by feature




SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead℠

Rush Creek Project (FERC 1389)

**Map 8.5-8e**

**Potential YT Habitat within the Study Area**

Date: 5/2/2024

0 125 250 500 Feet

**Projection: UTM Zone 11**
**Datum: NAD 83**



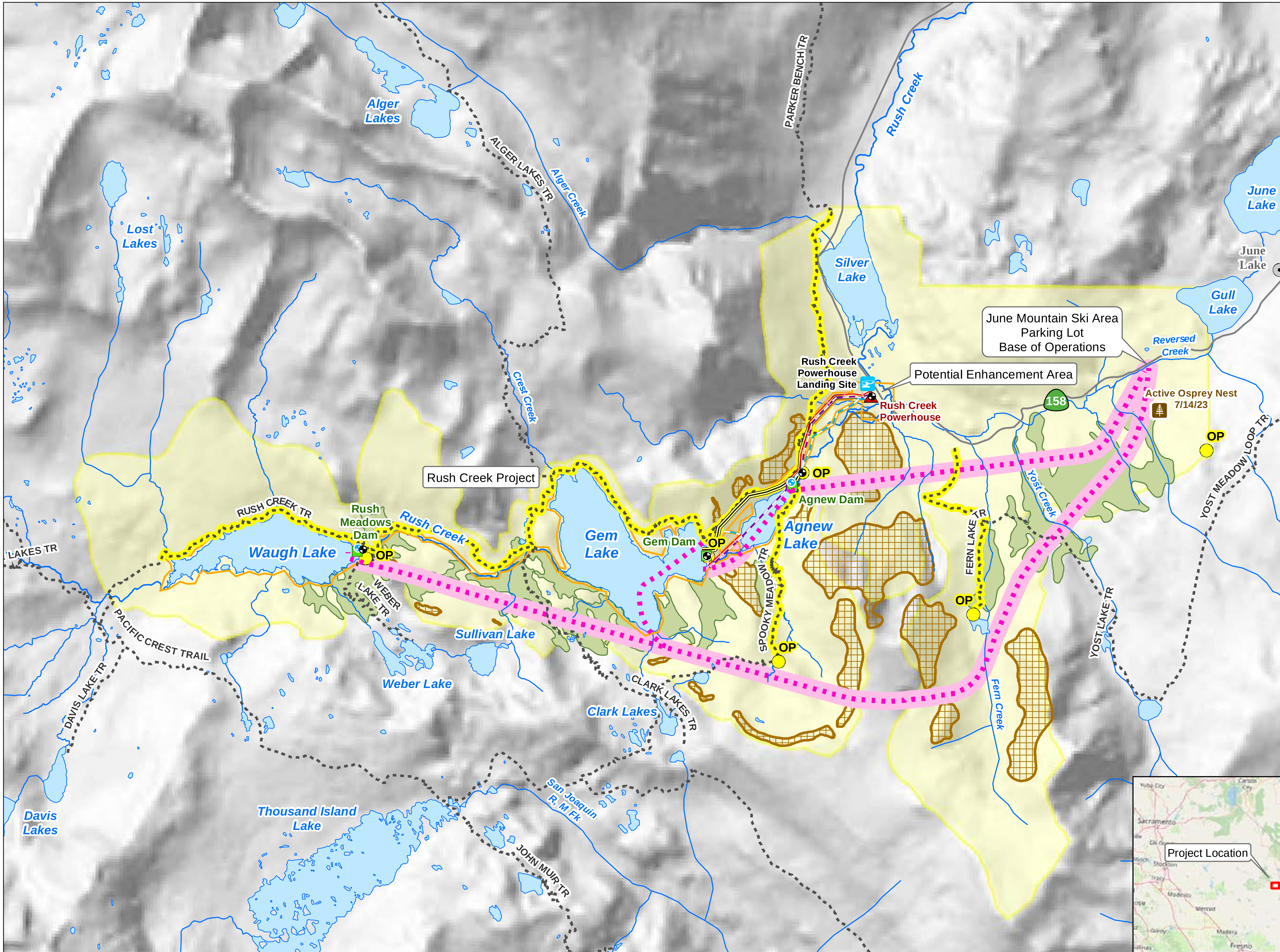
C:\GIS\237800343\map\Rush Creek\AquaticMaps\SCE_RUSH_CREEK_AQ7_PotnHab_YT_17i11i_04.mxd

# CONFIDENTIAL INFORMATION

The following map is being withheld from public disclosure in accordance with applicable regulations. It contains details on the locations of special-status biological resources and qualifies as Confidential Information (18 Code of Federal Regulations § 385.1112). Disclosure of such information could be harmful to these resources. To further understand the Federal Energy Regulatory Commission's regulations regarding confidential filings, visit: https://www.ferc.gov/foia.

**Map 8.5-8f YT Known Populations and Upland Habitat (Confidential)**

Map 8.5-8f 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.




## SCE Facilities

- Dam
- Powerhouse
- Flowline / Penstock
- Stream Gage
- Reservoir Gage
- Helicopter Landing Site
- Power Line
- Communication Line
- Tramway
- FERC Boundary

## Other Features

- Major City/Town
- Highway
- River/Stream
- Lake
- Potential Access Trails

## TERR-2 Raptor Nest Survey

- Proposed Raptor Observation Points (OPs)
- Raptor Survey Trails
- Viewshed from OPs*
- Osprey Nest

*Viewshed from OPs or Trails Limited to 2 Miles (Scope Limits)

## Raptor Study Area

- Approximate Helicopter Flight Path
- 300-foot Buffer

## Potential Raptor Habitat

- Cliff Nesting Habitat
- Forest Nesting Habitat

SOUTHERN CALIFORNIA EDISON

Energy for What's Ahead

Rush Creek Project (FERC 1389)

**Map 8.5-9**

**Potential Raptor Nesting Habitat within 300 Feet of Proposed Helicopter Flight Paths**

0 1,250 2,500 Feet

Date: 5/7/2024

**Projection: UTM Zone 11**
**Datum: NAD 83**



C:\GIS\237800343\map\Rush Creek\TerrestrialMaps\SCE_RUSH_CREEK_TERR2_PotnRaptorNestHab_17i11i_01.mxd

## TABLE OF CONTENTS

Page

8.6 Geology and Soils ........ 8.6-1
- 8.6.1 Information Sources ........ 8.6-1
- 8.6.2 Physiographic Setting ........ 8.6-2
- 8.6.3 Geologic Setting ........ 8.6-2
- 8.6.4 Bedrock Lithology ........ 8.6-3
- 8.6.5 Glacial Features ........ 8.6-3
- 8.6.6 Unconsolidated Sediments ........ 8.6-4
- 8.6.7 Structural Features ........ 8.6-4
- 8.6.8 Faulting and Seismicity ........ 8.6-5
- 8.6.9 Mineral Resources ........ 8.6-6
- 8.6.10 Soils ........ 8.6-6
- 8.6.11 Reservoir Shorelines ........ 8.6-8
- 8.6.12 Current Erosion Management ........ 8.6-10
- 8.6.13 References ........ 8.6-11

## LIST OF TABLES

Table 8.6-1. Simplified Geologic Time Scale* ........ 8.6-14

Table 8.6-2 Mass-Wasting Sites in the Rush Creek Watershed Grouped by Geologic Rock Type ........ 8.6-15

Table 8.6-3. Description of Soils in the Vicinity of the Project ........ 8.6-17

Table 8.6-4. Change in Reservoir/Lake Physical Data After 2012 Specifications ........ 8.6-19

## LIST OF FIGURES

Figure 8.6-1. Waugh Lake Footprint ........ 8.6-21

Figure 8.6-2. Gem Lake Varial Zone Showing Some Limited Revegetation in the Upper Less Frequently Inundated Zone Due to the Seismic Restriction ........ 8.6-22

Figure 8.6-3. Agnew Lake Varial Zone Revegetation in the Inlet Delta Area Due to the Seismic Restriction ........ 8.6-22

## LIST OF MAPS

Map 8.6-1. Overview of the Vicinity of the Project ........ 8.6-24

Map 8.6-2. Topography in the Vicinity of the Project ........ 8.6-25

Map 8.6-3. Geologic Rock Types and Faults in the Vicinity of the Project ...... 8.6-26

Map 8.6-4. Seismicity and Faults in the Vicinity of the Project ........ 8.6-27

Map 8.6-5. Historic and Current Mining Activity in the Vicinity of the Project .. 8.6-28

Map 8.6-6. Soil Types Within 0.5 Mile of the Rush Creek Project Boundary... 8.6-29

## LIST OF ACRONYMS

| | |
|---|---|
| ECSZ | Eastern California Shear Zone |
| FERC | Federal Energy Regulatory Commission |
| Forest Service | United States Forest Service |
| km | kilometer |
| msl | mean sea level |
| 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 |

## 8.6 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). 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 8.7, Geomorphology.

### 8.6.1 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).

### 8.6.2 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 northeast of the Rush Creek Powerhouse. The primary Project features, together with Rush Creek downstream to Mono Lake are shown on Map 8.6-1.

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 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 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. Rush Meadows 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 8.6-2.

### 8.6.3 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 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

[1] A generalized geologic time scale is provided in Table 8.6-1 for reference.

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 8.6.5.

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 8.6-3.

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 8.6-3. 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 detail in Section 8.6.8.

### 8.6.4 Bedrock Lithology

The general geologic rock types in the vicinity of the Project as mapped by the USGS are shown on Map 8.6-3. 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.

### 8.6.5 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 in the topography shown on Map 8.6-2 and many of the small lakes in the vicinity of the Project occupy cirques.

[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.

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 8.6-3, 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.

### 8.6.6 Unconsolidated Sediments

The Project facilities are 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. Mass-wasting sites in the upper and lower watersheds were identified and mapped using aerial imagery. The bedrock lithology contributing to each mass-wasting site was identified, and the frequency of sediment recruitment from each rock type was calculated. Most of the mass-wasting processes occur in areas with volcanic, meta-volcanic, and sedimentary marine sedimentary rock types, followed by sediment contribution from granitic rocks (Table 8.6-2). Sediment recruitment from mass-wasting is discussed in greater detail in Section 8.7, Geomorphology. Maps 8.7.2.3 a, b, and c, show mass-wasting sites in the western, northern, and eastern portions of the study area. Table 8.7.2.3 summarizes mass-wasting site acreage and ratings of sediment delivery potential to waterways.

### 8.6.7 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).

### 8.6.8 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 8.6-4 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 8.6-3 and 8.6-4.

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 can produce earthquakes up to about magnitude 6.5 (AMEC 2011).

The Hartley Springs Fault is a north to northwest 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 can produce earthquakes up to about magnitude 6.4 (AMEC 2011).

As indicated on Map 8.6-3, the Silver Lake Fault crosses through the Federal Energy Regulatory Commission (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 can produce earthquakes up to about magnitude 6.5 and 6.3, respectively (AMEC 2011).

### 8.6.9 Mineral Resources

Historic and current mining activity in the Watershed is shown on Map 8.6-5. 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.

### 8.6.10 Soils

Soils found within 0.5 mile of Project facilities and associated Project-affected reaches are shown on Map 8.6-6 and a description of the soil units shown on Map 8.6-6 is provided in Table 8.6-3. The information presented on the Map 8.6-6 and in Table 8.6-3 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 8.6-6 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 8.6-3. 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 Natural Resources Conservation Service 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 8.6-3. 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.

[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.

### 8.6.11 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, as well as a description of sediment contribution to waterways and reservoirs from mass-wasting processes, are provided in Section 8.7, Geomorphology.

#### 8.6.11.1 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 varial 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.

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 8.6-4, 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 8.6-1). Limited sediment has accumulated in the reservoir since the reservoir was constructed (Figure 8.6-1) (see Section 8.7, Geomorphology). During seasons when the reservoir is drawn down, it is possible that some areas of the reservoir footprint could be vulnerable to erosion.

#### 8.6.11.2 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.

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 8.6-4, 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 8.6-2), 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.

### 8.6.11.3 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.

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 8.6-4, 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 8.6-3). The coarse substrate/bedrock nature of the exposed shoreline generally eliminates the potential for erosion along the shoreline.

## 8.6.12 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).

### 8.6.13 References

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

Bateman, Paul C. 1968. 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

## Table 8.6-1. 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 years to present |
| | | | **Pleistocene** | 2.588 mya to 11,700 years |
| | | **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)

## Table 8.6-2 Mass-Wasting Sites in the Rush Creek Watershed Grouped by Geologic Rock Type

| Drainage Basin (acres) | Rock Type | Total Number of Mass-Wasting Sites | Total Area of Mass-Wasting Sites (acres) | Percentage of Mass-Wasting Area for Each Rock Type |
|---|---|---|---|---|
| Waugh Lake (9,587) | G | 15 | 438 | 30.9 |
| | MV | 1 | 99 | 6.9 |
| | MV, G | 1 | 203 | 14.3 |
| | V, MV, G | 5 | 83 | 5.8 |
| | Ma, G | 1 | 1 | 0.1 |
| | V, MV | 22 | 589 | 41.5 |
| | V, MV, Ma | 1 | 7 | 0.5 |
| Gem Lake (4,422) | G | 7 | 22 | 4.7 |
| | MV | 15 | 363 | 77.2 |
| | Ma | 2 | 3 | 0.6 |
| | VF | 3 | 13 | 2.8 |
| | MV, G | 4 | 20 | 4.3 |
| | MV, S, Ma | 1 | 3 | 0.5 |
| | G, V, MV | 1 | 3 | 0.7 |
| | Ma, G | 1 | 5 | 1.0 |
| | V, MV | 7 | 37 | 7.8 |
| | V, MV, VF | 1 | 2 | 0.3 |
| Agnew Lake (807) | G | 2 | 33 | 11.4 |
| | Ma | 3 | 34 | 11.7 |
| | Ma, G | 2 | 139 | 47.6 |
| | VF, G, Ma | 1 | 85 | 29.2 |

| Drainage Basin (acres) | Rock Type | Total Number of Mass-Wasting Sites | Total Area of Mass-Wasting Sites (acres) | Percentage of Mass-Wasting Area for Each Rock Type |
|---|---|---|---|---|
| Below Agnew Lake (873) | Ma | 4 | 84 | 76.4 |
| | Ma, G | 2 | 26 | 23.6 |
| Silver Lake (4,806) | G | 2 | 26 | 1.7 |
| | MV | 8 | 387 | 25.0 |
| | Ma | 14 | 804 | 51.9 |
| | Ma, G | 3 | 331 | 21.4 |
| June Lake (9,639) | G | 11 | 312 | 56 |
| | Ma | 3 | 170 | 30 |
| | Ma, GD | 1 | 37 | 7 |
| | GD | 4 | 10 | 2 |
| | G, GD | 1 | 32 | 6 |

Key: G = granitic
GD = glacial deposits
Ma = marine sedimentary
MS = metasedimentary
MV = meta-volcanic
S = sedimentary
V = volcanic
VF = volcanic flow rocks

**Table 8.6-3. 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

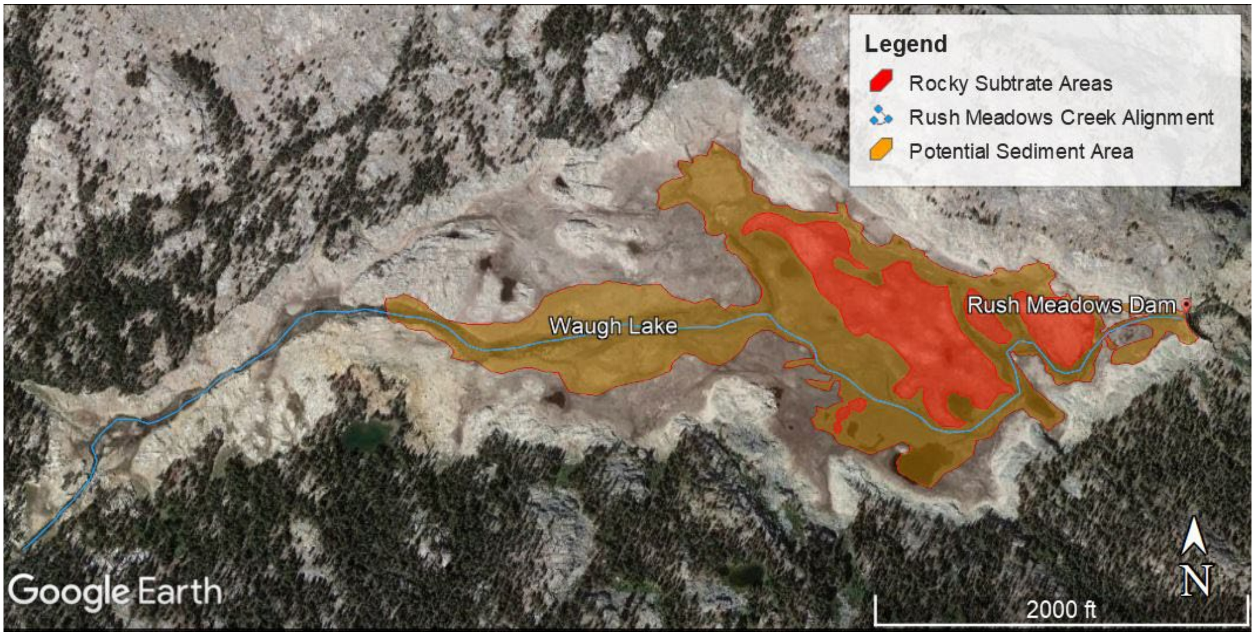
### Table 8.6-4. Change in Reservoir/Lake Physical Data After 2012 Specifications

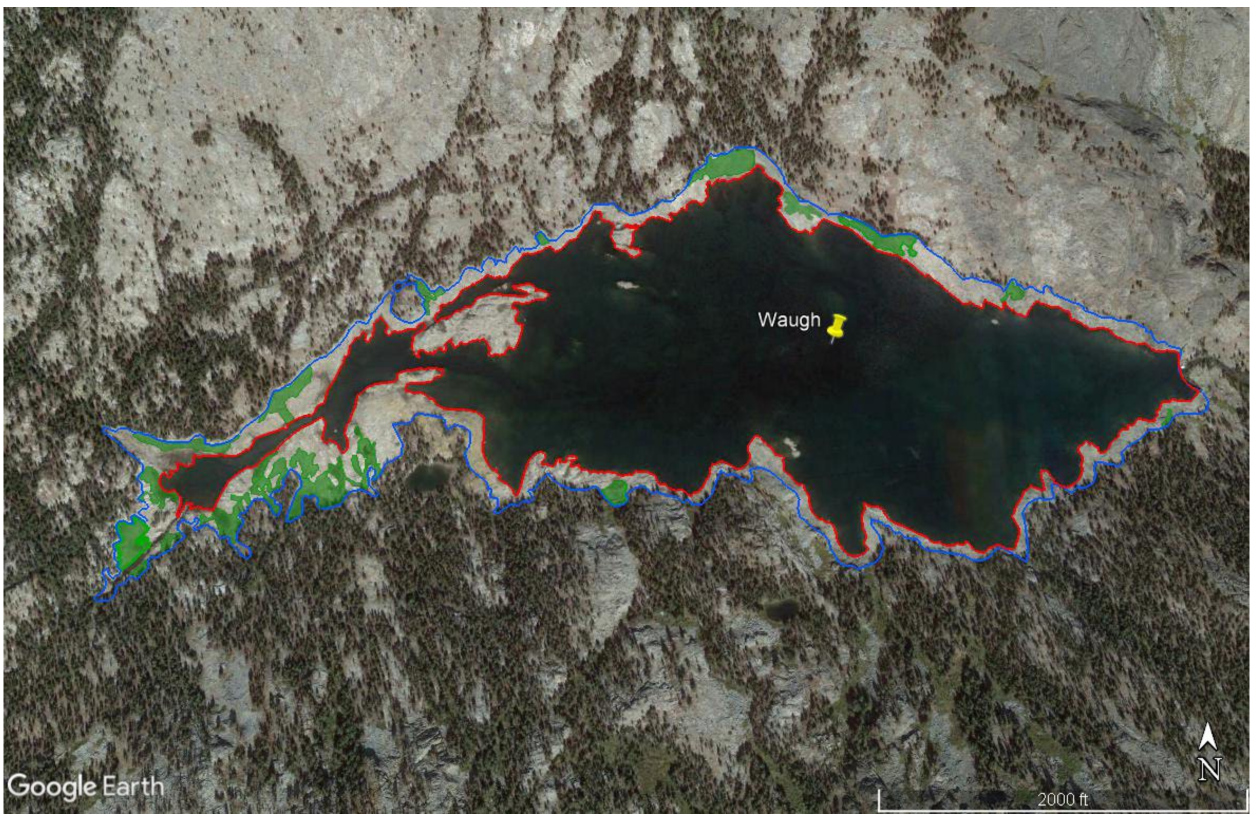
| Reservoir/Lake | Surface Area (acres) | Gross Storage Volume (acre-feet) | Max Operating Water Surface Elevation/High Water Mark (feet) | Shoreline Length (miles) | Substrate Composition |
|---|---|---|---|---|---|
| **Waugh Lake** | | | | | |
| Pre-2012 Specifications | 185 | 5,277 | 9,415.6 | 4.57 | 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.

# FIGURES




Note: Map (top) shows 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 8.6-1. Waugh Lake Footprint**

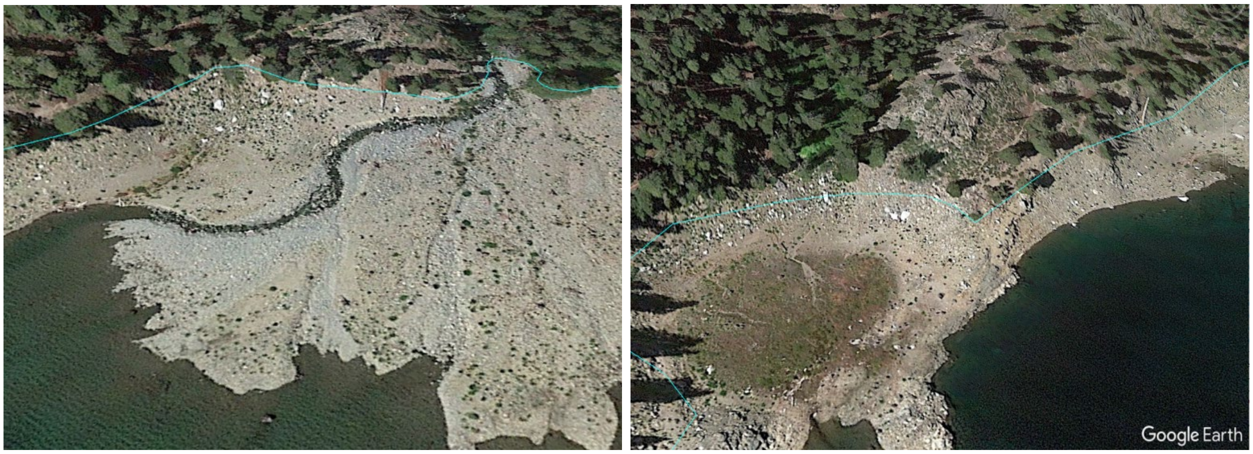
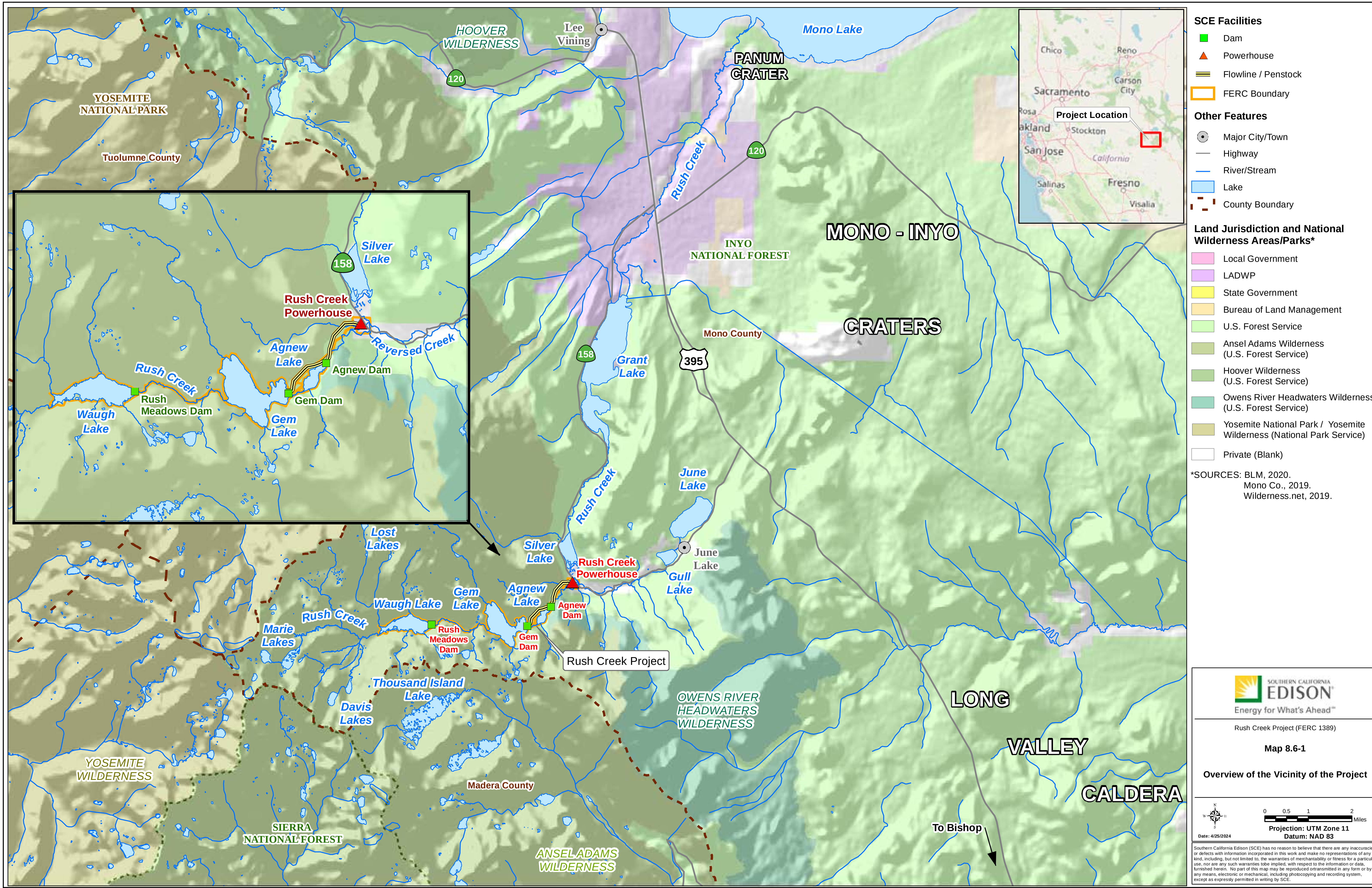



**Figure 8.6-2. Gem Lake Varial Zone Showing Some Limited Revegetation in the Upper Less Frequently Inundated Zone Due to the Seismic Restriction**


Note: Left image 2013 and right image 2019.

**Figure 8.6-3. Agnew Lake Varial Zone Revegetation in the Inlet Delta Area Due to the Seismic Restriction**

# MAPS



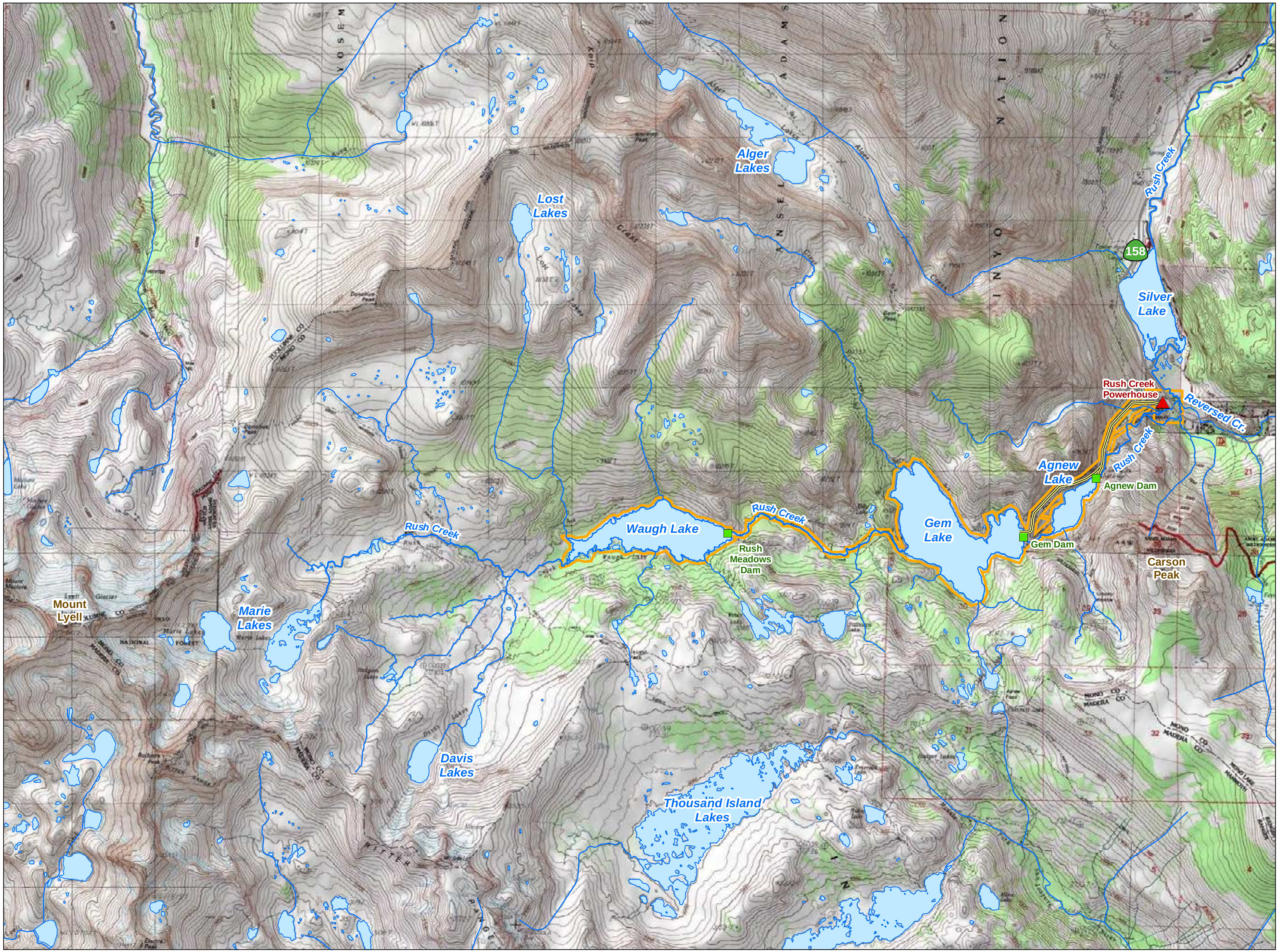

Rush Creek Project (FERC 1389)

Map 8.6-1

Overview of the Vicinity of the Project



C:\GIS\237800343\map\Rush Creek\GeoMaps\SCE_RUSH_CREEK_Geo_Juris_17i11i_01.mxd




**SCE Facilities**

- Dam
- Powerhouse
- Flowline / Penstock
- FERC Boundary

**Other Features**

- Highway
- River/Stream
- Lake

Rush Creek Project (FERC 1389)

**Map 8.6-2**

**Topography in the Vicinity of the Project**

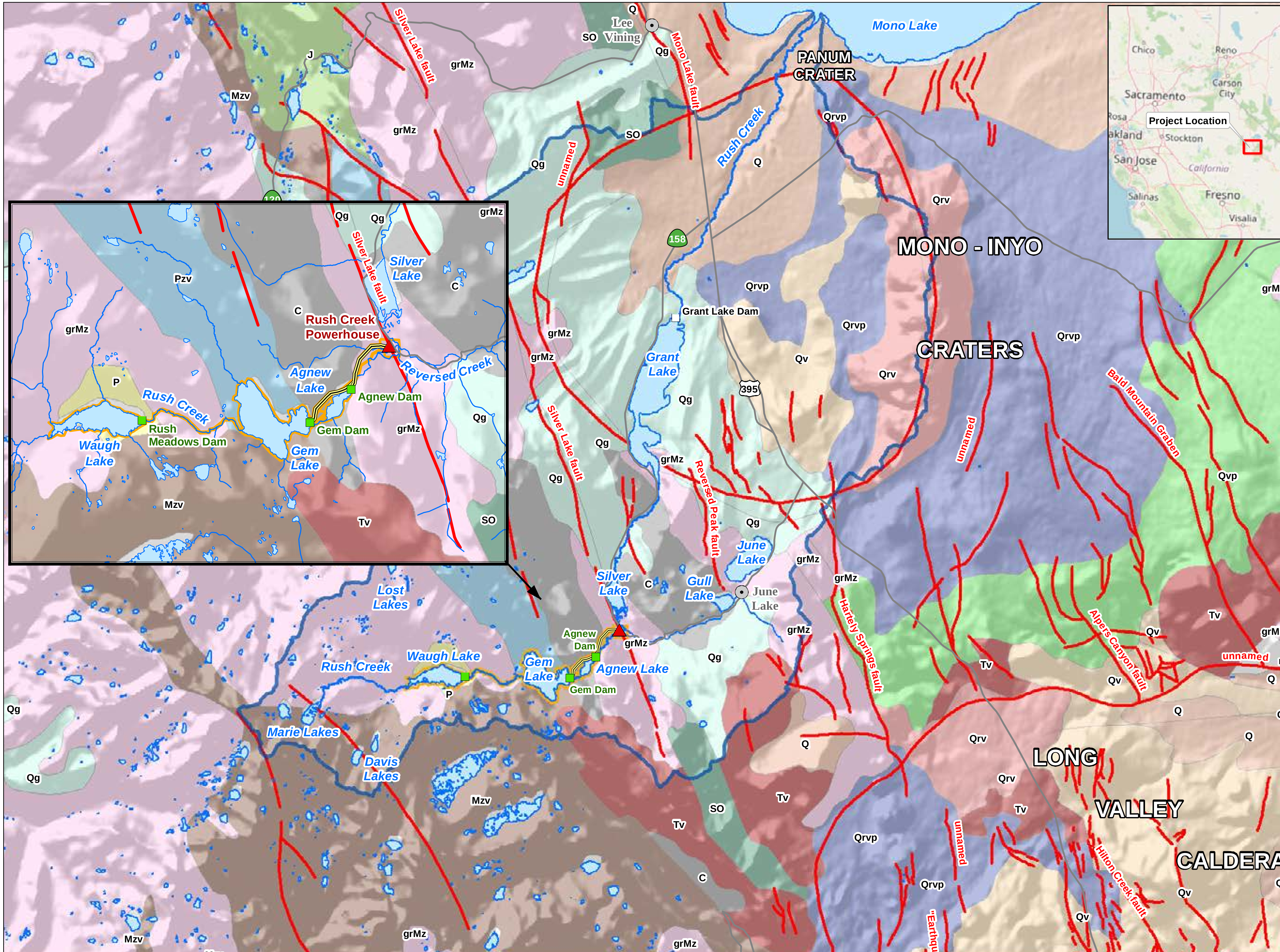
**Date: 4/25/2024**

0 0.25 0.5 Miles

**Projection: UTM Zone 11**
**Datum: NAD 83**



C:\GIS\237800343\map\Rush Creek\GeoMaps\SCE_RUSH_CREEK_Geo_Topo_17i11i_01.mxd




## 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
Energy for What's Ahead

Rush Creek Project (FERC 1389)

**Map 8.6-3**

**Geologic Rock Types and Faults in the Vicinity of the Project**

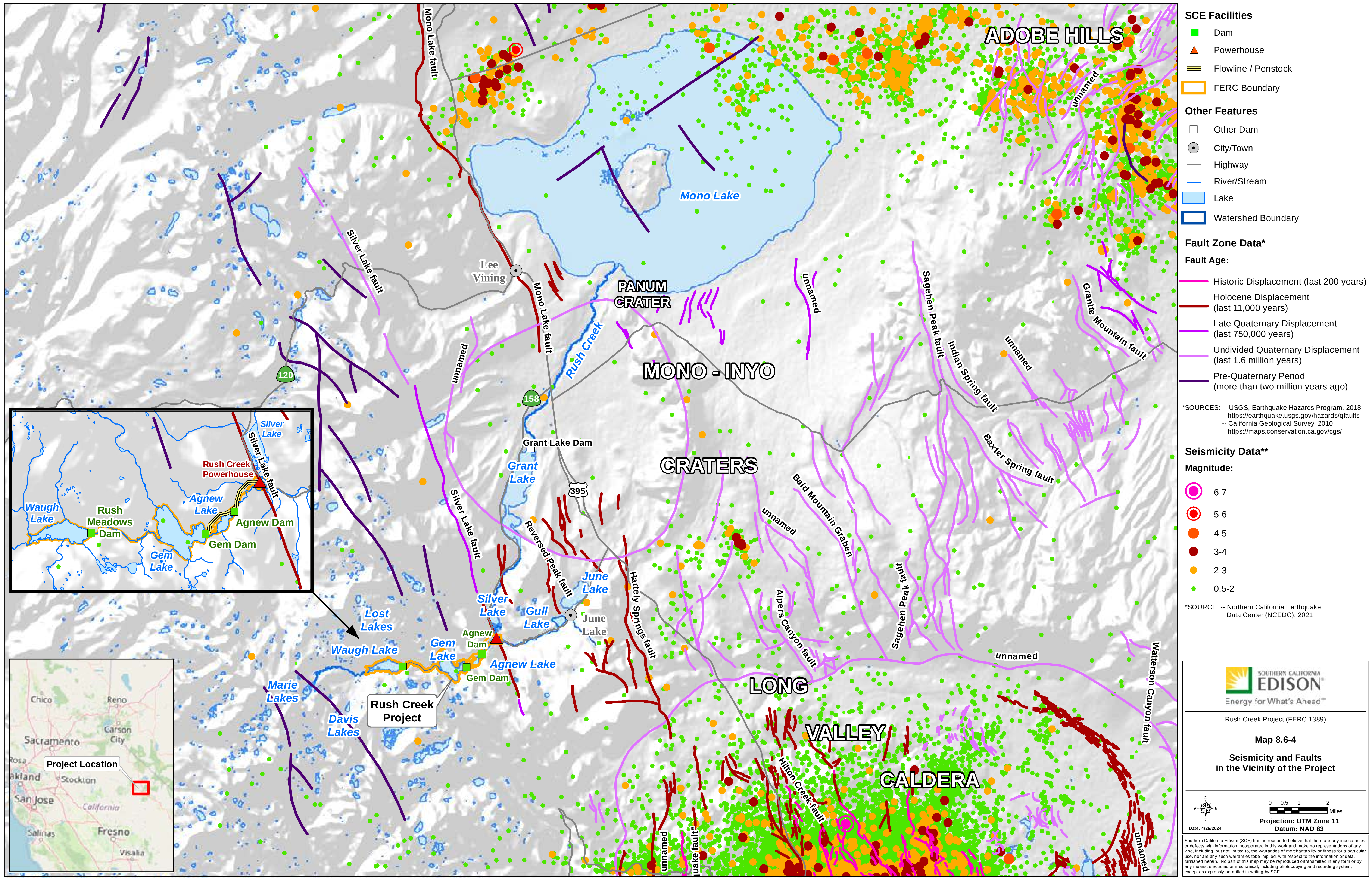
Date: 4/25/2024

0 0.5 1 Miles

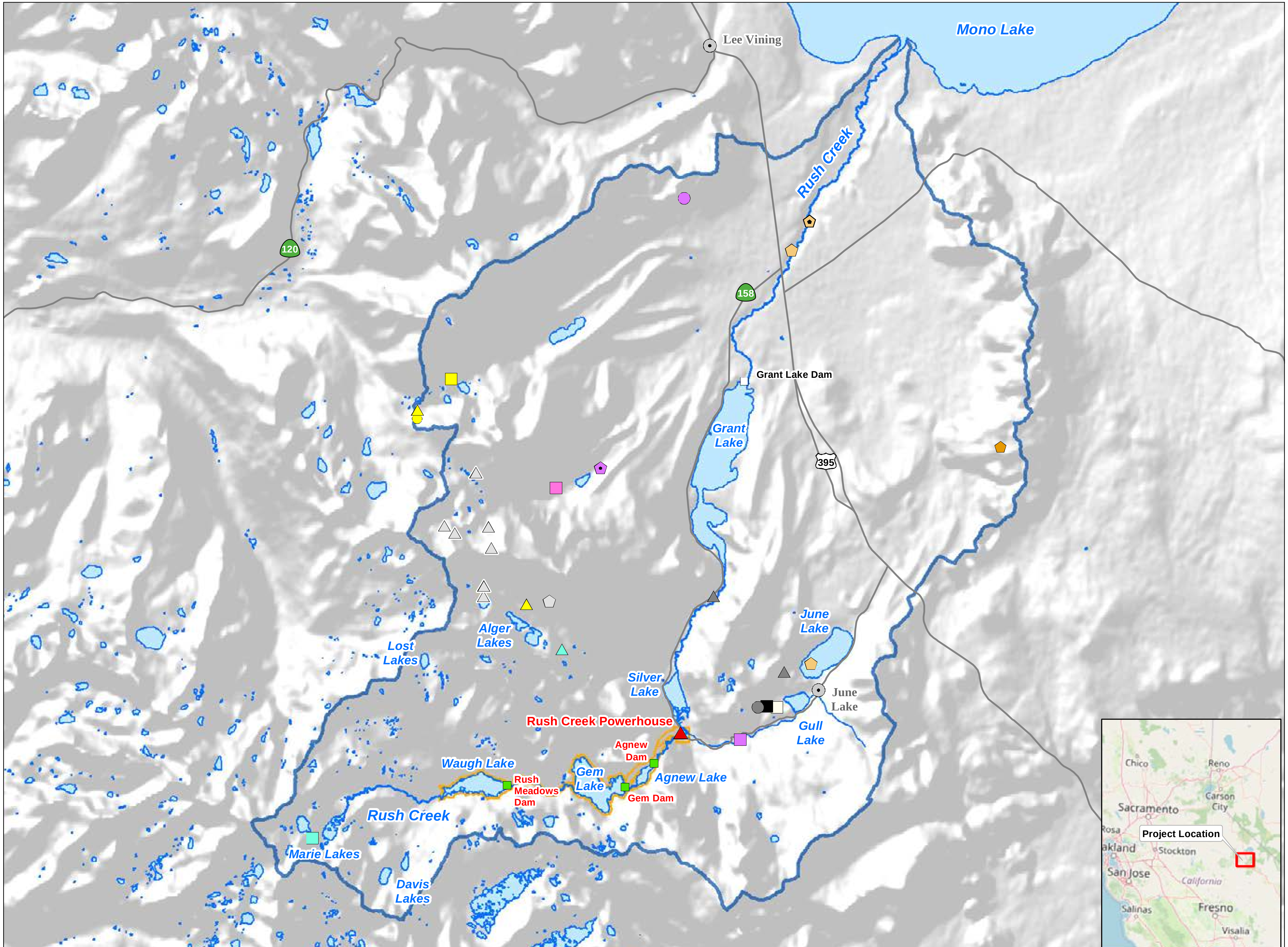
**Projection: UTM Zone 11**
**Datum: NAD 83**



C:\GIS\237800343\map\Rush Creek\GeoMaps\SCE_RUSH_CREEK_Geo_Rock_Faults_17i11i_01.mxd




C:\GIS\237800343\map\Rush Creek\GeoMaps\SCE_RUSH_CREEK_Geo_Seismicity_Faults_17i11i_01.mxd




**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
Energy for What's Ahead

Rush Creek Project (FERC 1389)

**Map 8.6-5**

**Historic and Current Mining Activity in the Vicinity of the Project**

N W E S

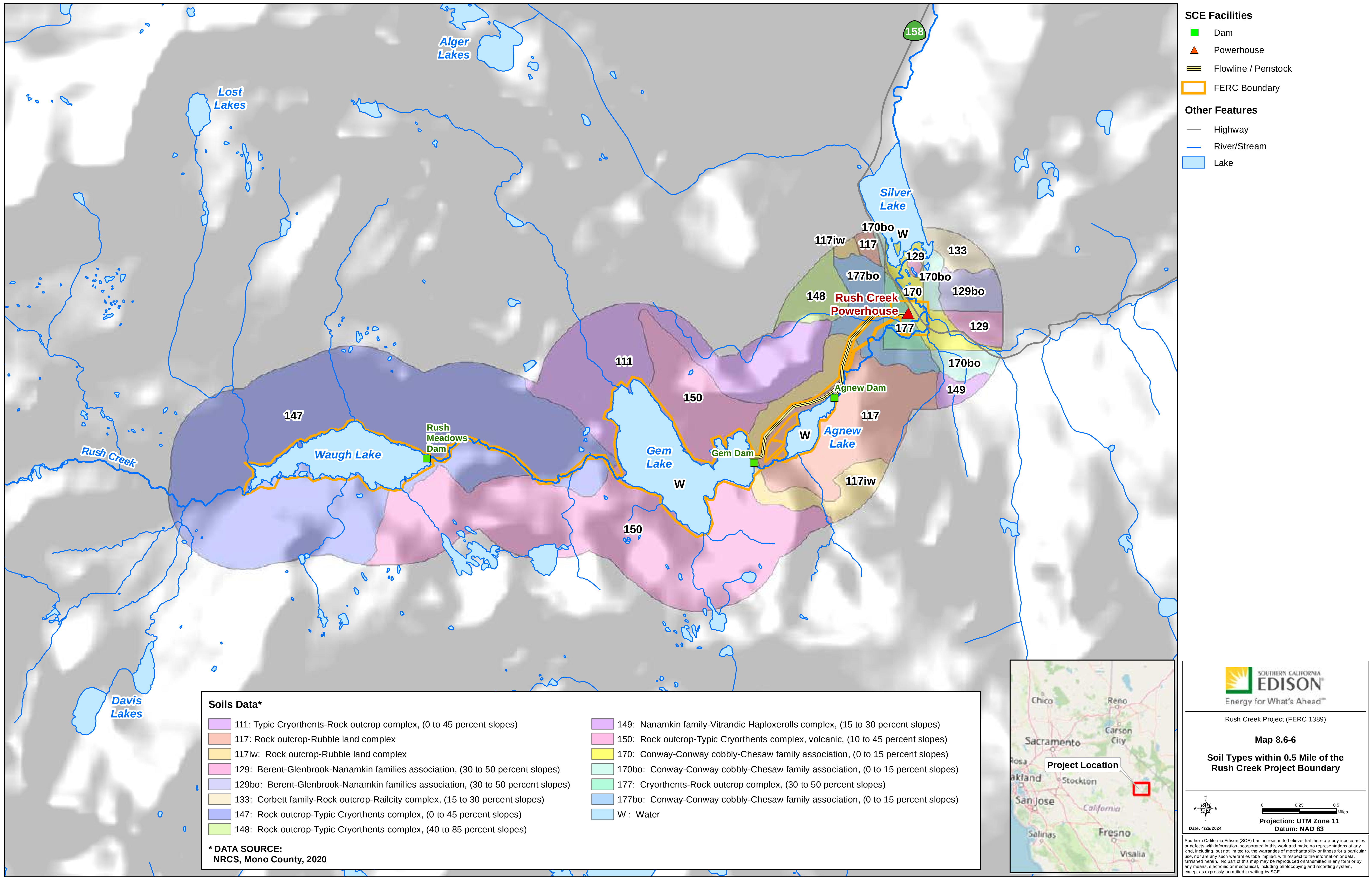
0 0.5 1 Miles

Date: 4/25/2024

**Projection: UTM Zone 11**
**Datum: NAD 83**



C:\GIS\237800343\map\Rush Creek\GeoMaps\SCE_RUSH_CREEK_Mining_17i11i_01.mxd




C:\GIS\237800343\map\Rush Creek\GeoMaps\SCE_RUSH_CREEK_Soils_17i11i_01.mxd

## TABLE OF CONTENTS

Page


8.7 Geomorphology ........ 8.7-1

8.7.1 Information Sources ........ 8.7-1

8.7.2 General Geomorphic Setting ........ 8.7-2

8.7.3 Channel Reach Geomorphology ........ 8.7-3

8.7.4 Sediment Supply ........ 8.7-4

8.7.5 Sediment Conditions in Project-Affected Stream Segments ........ 8.7-6

8.7.6 Initiation of Sediment Transport ........ 8.7-7

8.7.7 Suspended Sediment Sampling ........ 8.7-8

8.7.8 Silver Lake USGS Sediment Deposition Update ........ 8.7-8

8.7.9 References ........ 8.7-8


## LIST OF TABLES


Table 8.7-1. Geomorphic Assessment for Rush Creek Reaches Based on Montgomery and Buffington (1997) ........ 8.7-11

Table 8.7-2. Mass-Wasting Sites with Sediment Delivery Ratings ........ 8.7-12

Table 8.7-3. Silver Lake Delta Areas 1951–2019 ........ 8.7-14


## LIST OF FIGURES


Figure 8.7-1. Rush Creek in Waugh Lake (when drawn down) Showing Limited Historical Sediment Deposition Since Impoundment in 1925 ........ 8.7-16

Figure 8.7-2. 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) ........ 8.7-17

Figure 8.7-3. Rush Creek Below Gem Dam and Above Agnew Lake ........ 8.7-18

Figure 8.7-4. Rush Creek Below Agnew Dam ........ 8.7-19

Figure 8.7-5. Rush Creek Horsetail Falls Reach Including the South Rush Creek Distributary ........ 8.7-20

Figure 8.7-6. Rush Creek Above Silver Lake Including South Rush Creek and Reversed Creek....................8.7-21

Figure 8.7-7. Google Earth Aerial Imagery Rush Creek below Silver Lake and of a Debris Flow Near Rush Creek (facing downstream) near River Mile [RM] 15.7 to RM 15.1 ....................8.7-22

Figure 8.7-8. Low Gradient Portion of South Rush Creek Upstream of the Highway (top) and Downstream of the Highway (bottom) ............8.7-23

Figure 8.7-9. Schematic Illustration of Generalized Relative Trends in Sediment Supply (Qs) and Transport Capacity (Qc) in Mountain Drainage Basins ....................8.7-24

## LIST OF MAPS

Map 8.7-1. Geomorphology Study Sites ....................8.7-26

Map 8.7-2. Topography in the Rush Creek Watershed....................8.7-27

Map 8.7-3. Rush Creek Project-Affected Reaches....................8.7-28

Map 8.7-4a. Mass-Wasting Sites in the Western Portion of the Study Area .....8.7-29

Map 8.7-4b. Mass-Wasting Sites in the Northern Portion of the Study Area.....8.7-30

Map 8.7-4c. Mass-Wasting Sites in the Eastern Portion of the Study Area ......8.7-31

## LIST OF ACRONYMS

| | |
|---|---|
| AQ 5 – TSR | AQ 5 – Geomorphology Technical Study Report |
| Basin | Rush Creek Basin |
| cfs | cubic feet per second |
| FERC | Federal Energy Regulatory Commission |
| mm | millimeter |
| Project | Rush Creek Project |
| RM | river mile |
| SCE | Southern California Edison Company |
| USGS | United States Geological Survey |
| V*w | reach-weighted average |

## 8.7 GEOMORPHOLOGY

This section summarizes existing information regarding channel geomorphology and fluvial processes in the river reaches potentially affected by Southern California Edison Company's (SCE) Rush Creek Project (Project), including erosion, mass soil movement, slumping, or other forms of instability affecting these reaches.

Channel geomorphology is a description of the channel form (morphology), including dimensions, gradient, planform, pattern, and bed material particle size. 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 Federal Energy Regulatory Commission (FERC) regulations, however, this information is important to understanding aquatic and riparian habitat and channel maintenance processes 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 8.6, Geology and Soils. Section 8.8, Wetlands, Riparian, and Littoral Habitats, includes a description of the vegetation cover along the streambanks and shorelines.

### 8.7.1 Information Sources

This section was developed using existing information from 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
- California Fire Perimeters 1879–2019 Feature Layer (FRAP 2021)
- Pre-Application Document for the Rush Creek Project (SCE 2021)
- AQ 5 – Geomorphology Technical Study Report (AQ 5 – TSR) (SCE 2024), which is included in Supporting Document A. Data collected during 2023 is summarized in this section and geomorphic study sites are depicted in Map 8.7-1. Additional data collection will be completed in 2024 and included in an updated AQ 5 – TSR to be included in the Final License Application.

### 8.7.2 General Geomorphic Setting

The Rush Creek Basin (Basin) is described in Section 8.1, General Description of the Rush Creek Basin. The Basin is situated within the greater Mono Basin on the eastern slope of the Sierra Nevada (Map 8.1-1). 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 8.1-2a-g). Rush Creek can be divided into an upper, higher elevation basin where the Project is located (upstream of the Rush Creek Powerhouse) and a lower elevation basin along the valley floor downstream of the Rush Creek Powerhouse and the Reversed Creek confluence. A general overview of elevation relief, stream gradient, sediment supply (mass-wasting, bank and project-related erosion) in the Basin is provided below. Rush Creek hydrology is described in Section 8.2, Water Use and Hydrology.

#### 8.7.2.1 Elevation Relief and Channel Forms

The Rush Creek watershed ranges in elevation from approximately 6,400 feet at Mono Lake to 13,000 feet at the highest peaks in the headwaters. In the vicinity of the Project, elevations range from approximately 7,200 feet at the Rush Creek Powerhouse near Silver Lake to 9,400 feet at Waugh Lake (refer to Map 8.7-2 and Figure 8.2-4).

The geomorphology in the vicinity of the Project consists of dramatic topographic relief along the eastern Sierra Nevada escarpment as well as glaciated 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 channel is characterized by steep, incised reaches within rugged canyons characterized by cascading and step-pool bedforms interspersed with moderately entrenched channel reaches with pool-riffle bedforms in alpine meadows. The upper Basin channels have limited geomorphic landform development and are confined by V-shaped channels with steep-sided slopes and a prevalence of bedrock and coarser boulder-to-cobble substrates. Channels with these characteristics are generally not responsive to changes in flow and sediment regimes.

The lower Basin channel is characterized by more moderate gradient, moderately-to-poorly entrenched pool-riffle channels. Bed material is finer grained than the upper Basin, particularly above Silver Lake which is a sand-dominated bed. The channel is gravel dominated downstream of Silver Lake. The lower Basin channel geomorphology is more responsive to flow and sediment perturbations in the watershed (i.e., adjustable channel forms) than the upper Basin channel. Section 8.7.3 includes details on channel geomorphology and stream types.

#### 8.7.2.2 Stream Gradient

The longitudinal profile for Rush Creek is shown in Figure 8.2-4, Project-affected stream reaches are shown in Map 8.7-3, and the slopes for the Project-affected and non-Project stream reaches are shown in Table 8.1-4. The overall gradient of the upper Rush Creek Basin (above the confluence of Reversed Creek) is steep, 8.6 percent from Rush Creek Powerhouse to Waugh Lake (Rush Meadows Dam) with localized reach gradients ranging from 3.5 percent to 31.8 percent. In the lower Basin (Rush Creek from the

Reversed Creek confluence near the Rush Creek Powerhouse downstream to Mono Lake), the gradients are low-to-moderate, ranging from 0.6 percent to 1.8 percent.

### 8.7.3 Channel Reach Geomorphology

Rush Creek channel geomorphic classification and characterization was determined using two methods, Montgomery-Buffington (1997), which is a desk-top approach based on distinguishing channel bedforms, and Rosgen classification (Level I and II) which is based on field measurements of key morphometric features (SCE 2024).

Montgomery-Buffington stream types for the Rush Creek and South Rush Creek reaches are provided in Table 8.7-1. Figures 8.7-1 through 8.7-8 show representative photographs of the various reaches listed in the Table 8.7-1.

The upper Basin reaches of Rush Creek are predominantly steeper-gradient bedrock, cascade, and step-pool channel types characterized as transport reaches. These reaches have a much greater capacity to move sediment loads than the available sediment supply (commonly described as “supply-limited”), see Figure 8.7-9. These channel types are not sensitive to changes in flow and sediment supply (particularly bedrock and cascade types) and are considered mostly non-adjustable. However, in the river from below Rush Meadows Dam to Gem Lake, the non-adjustable channel types are about equally intermixed with moderate-gradient sections of pool-riffle and plane-bed channel types that are more responsive and adjustable. The pool-riffle and plane-bed channel types are considered transitional between supply-limited and transport-limited.

The Rush Creek reaches immediately above and below Silver Lake are moderate-to-low gradient plane bed, pool-riffle, and dune-ripple stream types. All these channel types are adjustable with a deformable bed and banks, having smaller bed material in the gravel to sand-size range. The reach above Silver Lake, a pool-riffle and dune-ripple channel type, is considered transport-limited. South Rush Creek is identified as bedrock and cascade channel types in the upper reaches where it splits from Rush Creek, but it is classified as a relatively flat gradient pool-riffle type in the lower reach near the confluence with Rush Creek.

River morphology was also categorized according to the Rosgen stream typing methodology based on recently collected field data (2023) to determine key morphometric parameters, including entrenchment ratio, width-depth ratio, gradient, sinuosity, and bed material particle size. AQ 5 – TSR, Map AQ 5-1 shows the Level I Rosgen stream types (SCE 2024). AQ 5 – TSR, Table AQ 5-4 shows the Rosgen Level I and Level II stream types by river mile (RM). In the upper Basin, below Rush Meadows Dam, the channel is nearly evenly split between A1 (0.47 mile), B3 (0.49 mile) and C3-C4 channel types (0.42 mile) that occur in alternating sections of the reach. The A1 and B3 channel types are steep, highly-to-moderately entrenched in their channels, with low sinuosity and with predominantly larger bed materials. The C3 and C4 channel types are lower gradient, poorly entrenched (high flows spread out over-bank onto a wide floodplain), sinuous, and are cobble and gravel dominant, respectively. Below Gem and Agnew dams the channel is nearly all a very steep, bedrock A1 channel type.

In the lower Basin, from upstream of Silver Lake to the Reversed Creek confluence, Rush Creek is predominantly a sand-bed C5 channel type. The reach below Silver Lake is nearly evenly split between B4 (1.38 mile) and C4 (1.26 mile) gravel bed channel types. South Rush Creek is a very steep, bedrock A1a+ channel type in its upper reach, but on the valley floor it is a lower gradient, poorly entrenched, gravel and sand C4/C5 channel type.

### 8.7.4 Sediment Supply

The location and relative volume of historical and existing sediment sources associated with hillslope mass-wasting, bank erosion, trail erosion, road-related erosion, and erosion associated with SCE project facilities are summarized below. Characterization of the quantities of any accumulated sediment that could be released from behind each dam (Waugh Lake, Gem Lake, and Agnew Lake) will be completed in the summer/fall of 2024 and reported in the DEC 1 – Full Decommissioning Study Report to be included in the Final License Application.

All sources of sediment – mass-wasting, bank erosion, roads, trails, Project-related infrastructure – cumulatively contribute to sediment loads (SCE 2024); however, mass wasting appears to be the primary source of sediment (see below). Field observations indicate that sediments, particularly finer sand sized (<2 millimeter [mm]) materials that are readily transported, are present throughout the watershed, but there is little evidence of sand deposition along most channel segments because of the high-gradient transport nature of the reaches. At the location of the Reversed Creek-Rush Creek confluence (RM 17.5) downstream to Silver Lake (RM 16.5), the channel bed is completely sand dominated because the gradient is very low. During high-runoff periods the channel and entire floodplain meadow area is inundated and stream velocity is extremely low, so sand transported from all other parts of the watershed (Rush Creek, Reverse Creek, unnamed tributaries) deposits in this reach.

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 area potentially contributing sediment to the Project-affected reaches (FRAP 2021).

#### 8.7.4.1 Mass-Wasting

As shown in Maps 8.7-4a-c and Table 8.7-2, 149 mass-wasting sites representing 4,400 acres were identified in the combined upper and lower Rush Creek watershed. Of these 4,400 acres, mass-wasting sites that are in direct contact with drainage pathways account for 2,574 acres (4.0 square miles) of contributing sediment sources. The upper watershed (14,800-acre drainage area) includes the Waugh Lake, Gem Lake, and Agnew Lake sub-areas. Within the upper Basin subwatersheds, 96 mass-wasting sites totaling 2,181 acres were identified. The lower Basin subwatersheds (15,300 acres) are located below Agnew Lake, Silver Lake, and June Lake (Table 8.7-2). Within the lower watersheds, 53 mass-wasting sites totaling 2,219 acres were identified (SCE 2024). Mass-wasting areas downstream of Silver Lake were not investigated.

Sediment sources in the upper Basin are dominated by mass-wasting processes including rockfalls and debris slides that deliver sediments to the base of steep slopes/cliffs (loose, heterogeneous soil/rock fragments deposited by rain wash/continuous downslope creep). Much of the sediments consist of talus deposits stored on the steep canyon slopes; however, there are locally derived inputs and several tributaries and glacial cirque lakes that directly receive sediment input through mass-wasting processes. On a watershed scale, mass wasting is the greatest relative source of sediments to stream channels, compared to bank erosion and anthropogenically generated sources (trails, Project facilities).

Historical construction of Project facilities (i.e., dams, trams, buildings, penstocks, access roads, trails) in the upper Basin has left some landscape scars, however these features are very localized in scale, and, because of the bedrock/coarse colluvial nature of the upper Basin, these areas have limited potential to provide sediment supply to waterways.

In the lower Basin, sediment supply is available to these streams predominantly from mass-wasting features including rockfalls, debris slides and debris flows. There are also local areas of bank erosion which is a source of finer-grained sediments. The Reversed Creek drainage is lower elevation with more developed soil horizons, including remnant materials from glacial activity. The lower Basin includes developments (housing/commercial), the June Mountain Ski Area, and roads/disturbance that likely 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 (Figure 8.7-7).

#### 8.7.4.2 Bank Erosion

Generally, the potential for bank erosion is very low throughout Rush Creek. Most of the Rush Creek watershed situated in the upper Basin above the valley floor consists of high-gradient A1/A2 and B1/B2 channel types where bank erosion potential is minimal due to bedrock and boulder armoring. Although some Rush Creek channel segments in the upper watershed with flatter gradients have a greater bank erosion potential, observations show that they are well-vegetated with minimal signs of active erosion.

In the lower Basin including Rush Creek, Reversed Creek, the lowermost reaches of South Rush Creek, and other tributaries on the valley floor including Yost, Fern, and unnamed creeks, the channels are characterized by lower gradients, more sinuous, smaller bed material, and finer-grained deformable bank material, making them more susceptible to perturbations and erosion. Despite this susceptibility, field inspections reveal well-vegetated streambanks with only isolated instances of minor erosion.

#### 8.7.4.3 Roads and Trails

Roads were determined to be minor sources of sediment. Most roads are located on the valley floor, which tend to generate less erosion than roads located on the steeper canyon side slopes, of which there are few in the watershed. A total of 42.3 miles of roads drain to Silver Lake of which 62 percent are classified as paved (impervious) and 38 percent are pervious roads surfaced with aggregate or unsurfaced (native soil) (AQ 5 – TSR, Table AQ 5-17). Locations identified in the field associated with the roads around Silver Lake that are frequently disturbed by vehicle / foot traffic and were near Rush Creek or locations that showed an indication of erosion / sediment conveyance to the stream are provided in AQ 5 – TSR, Table AQ 5-16. Although cumulatively roads will contribute some sediments to channels that eventually drain to the inlet of Silver Lake, no significant areas of erosion related to roads were identified.

Trail erosion was minor, focused around site-specific stream crossings. The Rush Creek Trail (non-Project trail) crosses unstable areas of mass wasting, but erosion around the trail is associated with the mass-wasting itself, with no significant erosion caused by the trails.

#### 8.7.4.4 Project Infrastructure

Erosion associated with Project facilities was characterized from Gem Dam downstream to the powerhouse. Some locations were noted as probable historical sources of sediment as well as more recent erosion sites. A total of 13 locations were identified in the field with 11 active sites and 2 inactive sites as summarized in AQ 5 – TSR, Table AQ 5-18. There may have been Project infrastructure related erosion in the past, including an emergency cut in the penstock below Agnew Dam that contributed an estimated 185 cubic yards of sediment to Rush Creek in 2017. However, none of the Project infrastructure sites inspected were identified as significant sources of erosion and sediment production.

### 8.7.5 Sediment Conditions in Project-Affected Stream Segments

Fine sediment in pools was generally limited to a small proportion of the residual pool volume. In 21 of the 25 sampled pools, V* values were less than 0.10, indicating very little fine sediment storage (SCE 2024). Reach-weighted average (V*w) values were equal to or less than 0.15 for all sampled reaches, indicating minor fine sediment storage in the project-affected streams. The Rush Creek Above Silver Lake (Downstream of Reversed Creek Confluence) reach is a low gradient meadow/wetland dominated by fine sediment and did not contain pools that meet the Hilton and Lisle (1993) pool selection criteria, therefore V* surveys were not performed in this reach.

The $D_{50}$ of the 25 bulk samples collected in spawning riffles were within the typical size range of spawning material used by trout, approximately 20 mm (Kondolf and Wolman 1993). Fine sediment was generally within the size criteria to support high reproductive success. Fine sediment <1 mm was relatively low in the gravel samples, none of the gravel samples exceeded the 14 percent criteria. Fine sediment content for 21 of the 25 gravel samples were within the <30 percent criteria for the <6.4 mm particle size, with four samples exceeding the criteria (samples exceeding the criteria were in Rush Creek above Silver Lake reach and in the Rush Creek below Silver Lake reach). After accounting for fine sediment reduction due to winnowing during spawning, all 25 samples were within the <30 percent criteria.

Seven bed sediment core samples were collected along Rush Creek from the Silver Lake delta inlet and upstream 0.67 mile along the channel. The $D_{50}$ for all samples was consistently very coarse sand, averaging 1.3 mm and ranging from 0.8–1.5 mm with no apparent decreasing gradation in size from upstream to downstream.

### 8.7.6 Initiation of Sediment Transport

Initiation of sediment transport analysis was performed at each of the Rush Creek transects for four assessment reaches. Calculations were performed to determine the discharge needed to mobilize the $D_{50}$ particle size (determined from the pebble count data) over a minimum of 25 percent of the active channel bed. Additionally, to evaluate the mobility of spawning size gravel important for trout habitat, calculations were made to determine the discharge needed to mobilize a 32 mm particle (coarse gravel) over a minimum of 25 percent of the active channel bed.

Discharge calculated for the field identified bankfull elevations varied considerably on the four different mainstem Rush Creek reaches evaluated (SCE 2024). Bankfull discharge for the upstream reach (below Rush Meadows Dam) and most downstream reach (below Silver Lake) was 263 and 281 cubic feet per second (cfs), respectively. For the bypass reaches that are dominated by bedrock channels (Gem Dam to upstream of Reversed Creek) the bankfull discharge varied from 39 cfs (below Agnew Dam) to 68 cfs (upstream of Reversed Creek). Both reaches are predominantly A1+ steep bedrock, non-adjustable channels, representing 0.31 and 0.85 mile, respectively. The location of the transects for the bankfull assessment and initiation of motion analysis were applicable only to the much lower gradient adjustable channel sections representing just 0.07 mile and 0.11 mile, respectively. Therefore, the bankfull discharge characterization only applied to a small proportion of the reach.

Results showing the flow needed to move a $D_{50}$ particle and a 32 mm spawning size gravel are provided in AQ 5 – TSR, Table AQ 5-13. The flows required to mobilize the $D_{50}$ particle size and 32 mm spawning gravels varied widely depending on variability in channel slope and morphology. At the selected transects analyzed, a discharge of 132 cfs or less was calculated to be capable of transporting a 32 mm size gravel (spawning gravel size). The $D_{50}$ substrate was calculated to mobilize at or near the bankfull flow at some transects but at other transects flows higher than bankfull were required to mobilize $D_{50}$ sized substrate.

### 8.7.7 Suspended Sediment Sampling

Suspended sediment samples were collected during the 2023 runoff period at five sampling locations all situated in the lower Basin (Reverse, Rush, South Rush, and unnamed creeks). Sediment concentrations are shown in the AQ 5 – TSR, Table AQ 5-19. Sediment concentration was similar at the each of the sampling sites and sediment concentration generally increased with magnitude of flow, but there was considerable scatter in the data, which is typical for sampling suspended sediments. All sampling sites contributed predominantly sand-sized sediments to the valley floor above Silver Lake. Silt made up a smaller proportion of the sediment transported and there was only a nominal amount of clay in the suspended load.

### 8.7.8 Silver Lake USGS Sediment Deposition Update

The United States Geological Survey (USGS) calculated changes in the Silver Lake delta area from 1951–1994 using time series historical aerial photography (Blodgett 1996). The USGS study found that the delta first became visible in 1963, encompassing 0.32 acre at that time. By 1993, the delta area had grown to 2.35 acres. The USGS analysis was updated using recent aerial photography from 2004 and 2019 (SCE 2024). The delta area has grown to 3.1 acres, an increase of 0.75 acre over the 26-year period since 1993. The delta area growth has not always been consistent, with periods of delta area loss also occurring. In 2004, the East Shore Sliver Lake Association dredged 5,800 cubic yards of delta material. The findings show that overall, the delta continues to increase in size, but the rate of increase is slower than it was in the 1970s and early 1980s which was a period with a high rate of growth / development in the basin. Table 8.7-3 shows the Silver Lake Delta areas determined by the USGS and updated by SCE in the AQ 5 – TSR (SCE 2024).

### 8.7.9 References

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

Blodgett. 1996. Storage Capacity, Detention Time, and Selected Sediment Deposition Characteristics for Gull and Silver Lakes, Mono County, California. U.S. Geological Survey Open-File Report 95-702.

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, and February 2024

Hilton, Sue, and Thomas E. Lisle. 1993. Measuring the fraction of pool volume filled with fine sediment. U.S. Forest Service, PSW-RN-414, July 1993

Kondolf, G.M., Michael J. Sale, and M. Gordon Wolman. 1993. Modification of fluvial size by spawning salmonids. Water Resources Research, Vol. 29, No.7 pgs 2265-2274, July 1993.

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

SCE (Southern California Edison Company). 2021. Pre-Application Document for the Rush Creek Project. December 2021.

_____. 2024. AQ 5 – Geomorphology Draft Technical Study Report. August. Provided in Supporting Document A of the Application for New License.

# TABLES

**Table 8.7-1. 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 | Evaluation of sediment deposition within the reservoir footprint will be performed in summer 2024 and reported in the Technical Study Report filed with the Final License Application. 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 (Figure 8.7-1). |
| Rush Creek Below Rush Meadow Dam | 3.47% (some lower and some steeper sections) | pool-riffle, plane bed, step-pool, cascade, bedrock | 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 8.7-2). |
| Rush Creek Below Gem Dam | 29.60% | bedrock, cascade, pool-riffle, plane bed | bedrock, limited sediment availability | supply limited | non-adjustable transport reach | valley confinement / bedrock | Very steep, confined bedrock reach (Figure 8.7-3). |
| Rush Creek Below Agnew Dam | 11.65% | bedrock, plane bed, cascade | bedrock, limited sediment availability | supply limited | non-adjustable transport reach | bedrock / valley confinement | Steep, confined bedrock reach (Figure 8.7-4 and Figure 8.7-5). |
| Rush Creek Horsetail Falls | 31.82% | bedrock, cascade | bedrock, limited sediment availability | supply limited | non-adjustable transport reach | bedrock | Very steep bedrock reach (Figure 8.7-5). |
| Rush Creek Above Silver Lake | 1.83% | pool-riffle, dune-ripple | 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 8.7.6). |
| Rush Creek Below Silver Lake | 0.59% | pool-riffle, plane bed | 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 8.7-7) |
| 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 8.7-5). The low gradient section is in places filled / clogged with large woody debris (Figure 8.7-6 and Figure 8.7-8 ). |

Notes:

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

## Table 8.7-2. Mass-Wasting Sites with Sediment Delivery Ratings

| Upper Watershed | | | | | |
|---|---|---|---|---|---|
| **Drainage Basin (acres)** | **Subwatersheds** | **Total Number of Mass-Wasting Sites** | **Total Area of Mass-Wasting Sites (acres)** | **Number of Mass-Wasting Sites with Direct Sediment Delivery to Waterways** | **Total Area of Mass-Wasting Sites with Direct Sediment Delivery to Waterways (acres)** |
| **Waugh Lake (9,587)** | Marie Lakes | 17 | 401 | 14 | 338 |
| | Rush Creek | 3 | 70 | 2 | 64 |
| | Rodgers Lakes | 8 | 102 | 3 | 45 |
| | Davis Lakes | 5 | 229 | 4 | 226 |
| | Waugh Lake | 2 | 9 | 1 | 1 |
| | Unnamed tributary/unnamed lake | 11 | 609 | 3 | 261 |
| | Waugh Lake basin totals | 46 | 1,420 | 27 | 934 |
| **Gem Lake (4,422)** | Crest Creek | 13 | 361 | 3 | 199 |
| | Rush Creek | 12 | 40 | 0 | 0 |
| | Clark Lakes | 4 | 15 | 2 | 4 |
| | Unnamed tributaries | 8 | 47 | 4 | 31 |
| | Gem Lake | 5 | 7 | 3 | 4 |
| | Gem Lake basin totals | 42 | 469 | 12 | 238 |
| **Agnew Lake (807)** | Rush Creek | 8 | 291 | 6 | 285 |
| **Upper watershed totals** | | 96 | 2,181 | 45 | 1,458 |

| Lower Watershed | | | | | |
|---|---|---|---|---|---|
| **Drainage Basin (acres)** | **Subwatersheds** | **Total Number of Mass-Wasting Sites** | **Total Area of Mass-Wasting Sites (acres)** | **Number of Mass-Wasting Sites with Direct Sediment Delivery to Waterways Having Unimpeded Connection to Silver Lake** | **Total Area of Mass-Wasting Sites with Direct Sediment Delivery to Waterways Having Unimpeded Connection to Silver Lake (acres)** |
| **Below Agnew Lake (873)** | Rush Creek | 5 | 44 | 2 | 25 |
| | unnamed tributary | 1 | 66 | 1 | 66 |
| | Below Agnew Lake basin totals | 6 | 110 | 3 | 91 |
| **Silver Lake (4,806)** | Alger Lakes/Unnamed tributary | 10 | 397 | 6 | 305 |
| | Alger Creek | 9 | 1,000 | 8 | 258 |
| | Silver Lake | 8 | 152 | 0 | 0 |
| | Silver Lake basin totals | 27 | 1,548 | 14 | 563 |
| **June Lake (9,639)** | Yost Creek | 7 | 247 | 6 | 241 |
| | Fern Creek | 7 | 229 | 3 | 206 |
| | South Rush Creek | 6 | 86 | 2 | 16 |
| | June Lake basin totals | 20 | 561 | 11 | 463 |
| **Lower watershed totals** | | 53 | 2,219 | 28 | 1,116 |

## Table 8.7-3. Silver Lake Delta Areas 1951–2019

| Date of Aerial Photography | Area of Delta Deposit (acres) |
|---|---|
| 08/10/1951 | none |
| 08/23/1963 | 0.32 |
| 08/14/1972 | 0.32 |
| 08/27/1983 | 2.05 |
| 08/11/1985 | 1.88 |
| 07/05/1987 | 3.12 |
| 10/04/1989 | 2.17 |
| 09/24/1993 | 2.22 (USGS) 2.35 (this study) |
| 09/29/1994 | 2.42 |
| 06/11/2005 | 2.1 (this study) |
| 09/2019 | 3.1 (this study) |

*Source: Blodgett 1996.*

# FIGURES

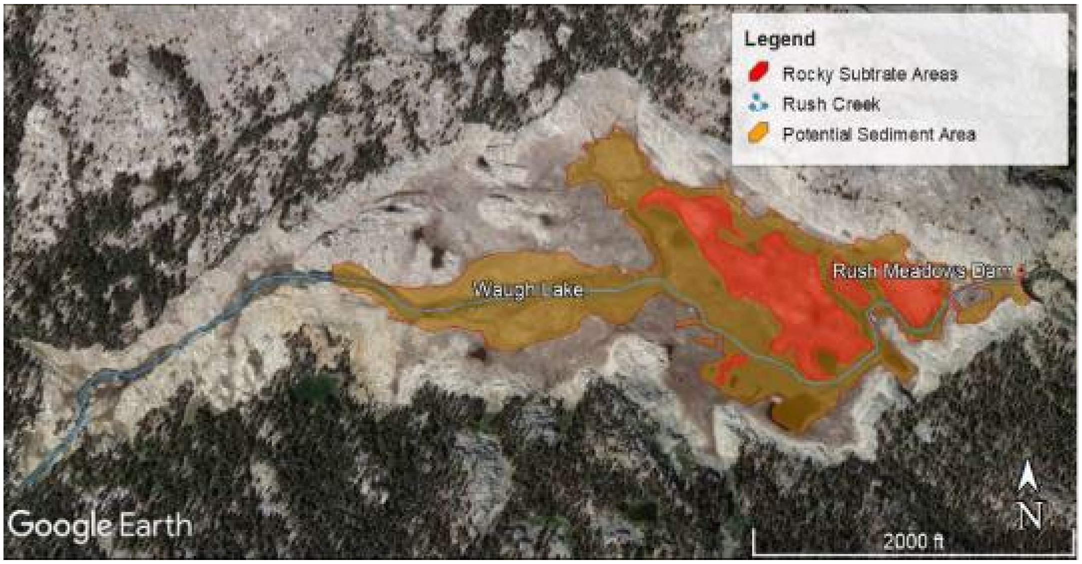



**Figure 8.7-1. Rush Creek in Waugh Lake (when drawn down) Showing Limited Historical Sediment Deposition Since Impoundment in 1925**

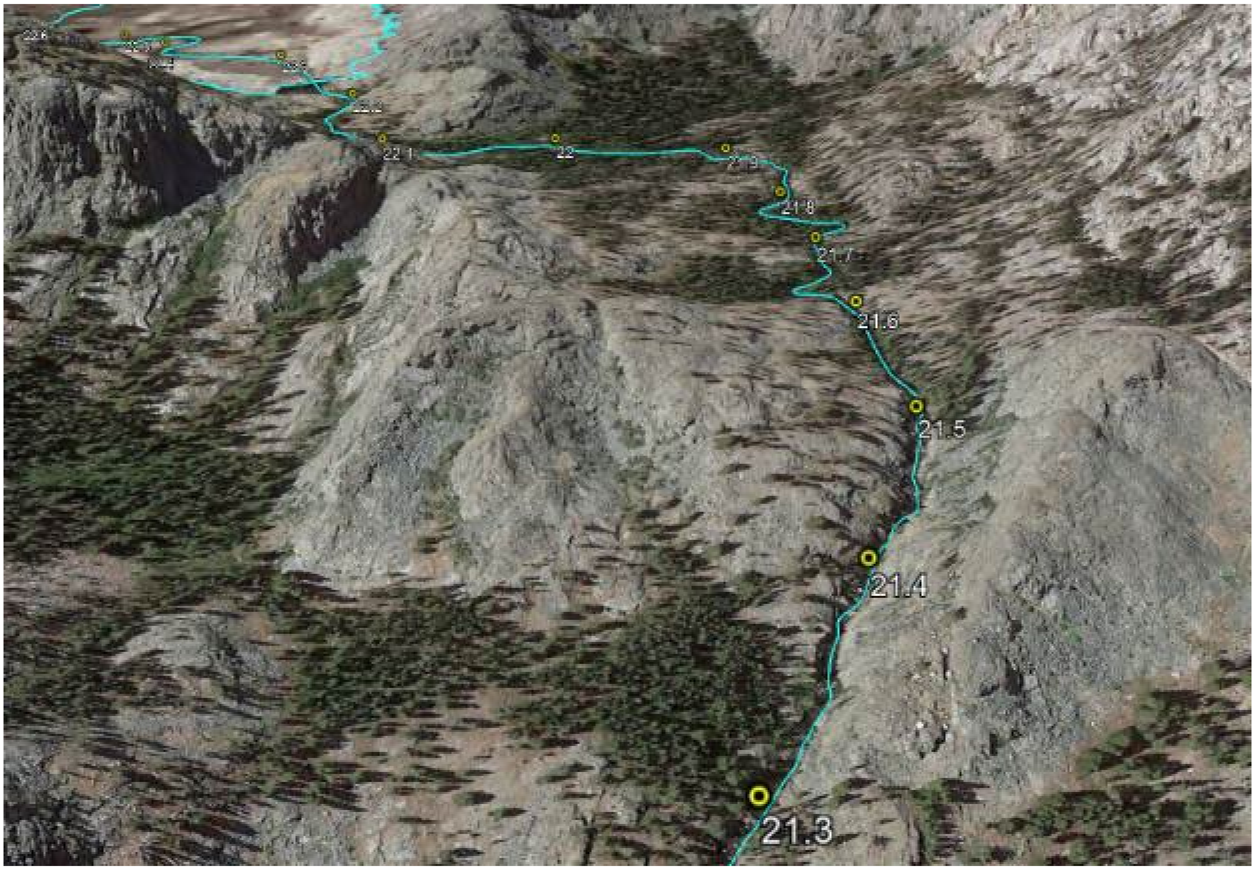



**Figure 8.7-2. Lower Gradient and a Steeper Gradient, Confined Section of Rush Creek below Rush Meadows Dam (top) and Low Gradient Section of Rush Creek Below Rush Meadows Dam (bottom)**

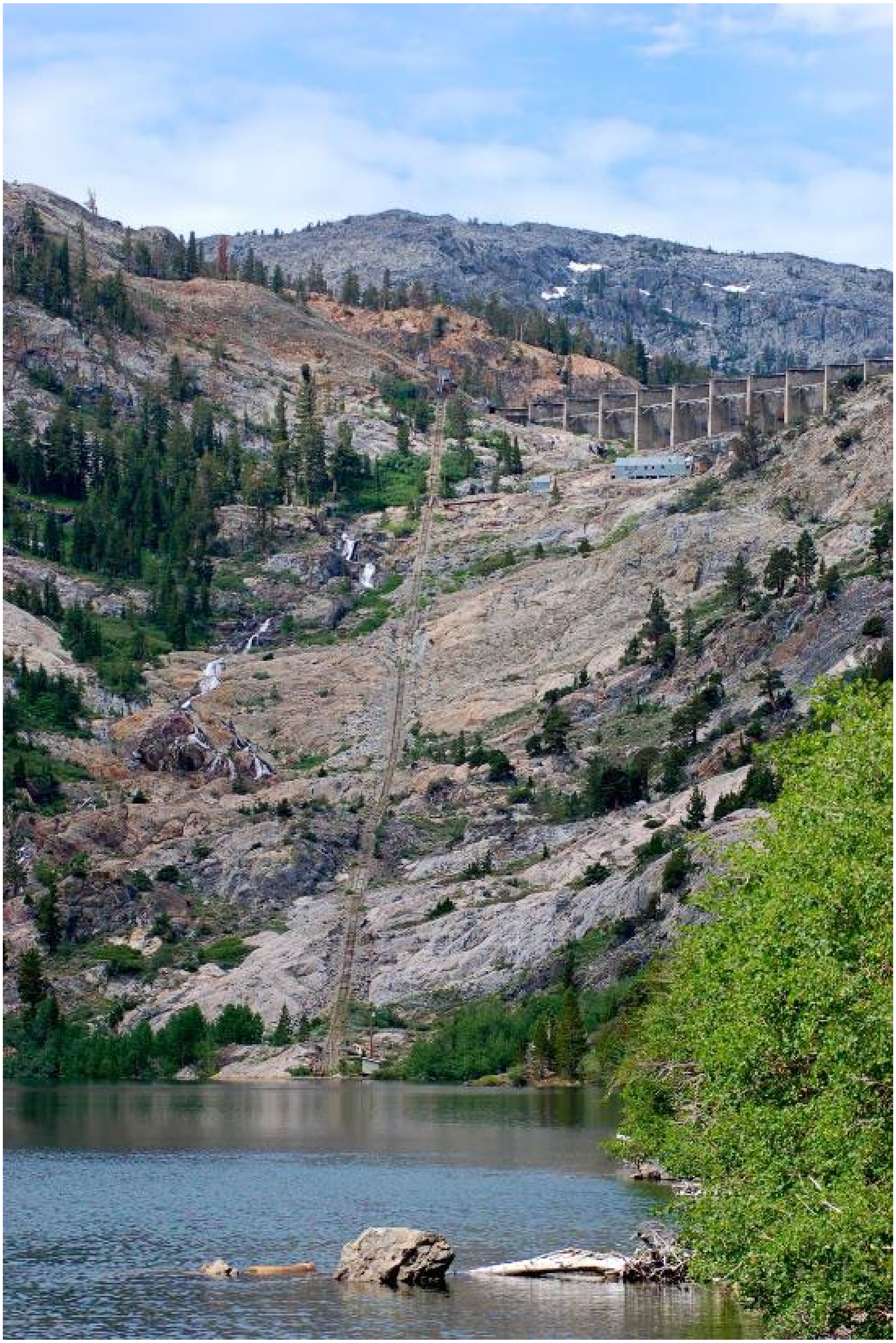


**Figure 8.7-3. Rush Creek below Gem Dam and above Agnew Lake**


**Figure 8.7-4. Rush Creek below Agnew Dam**

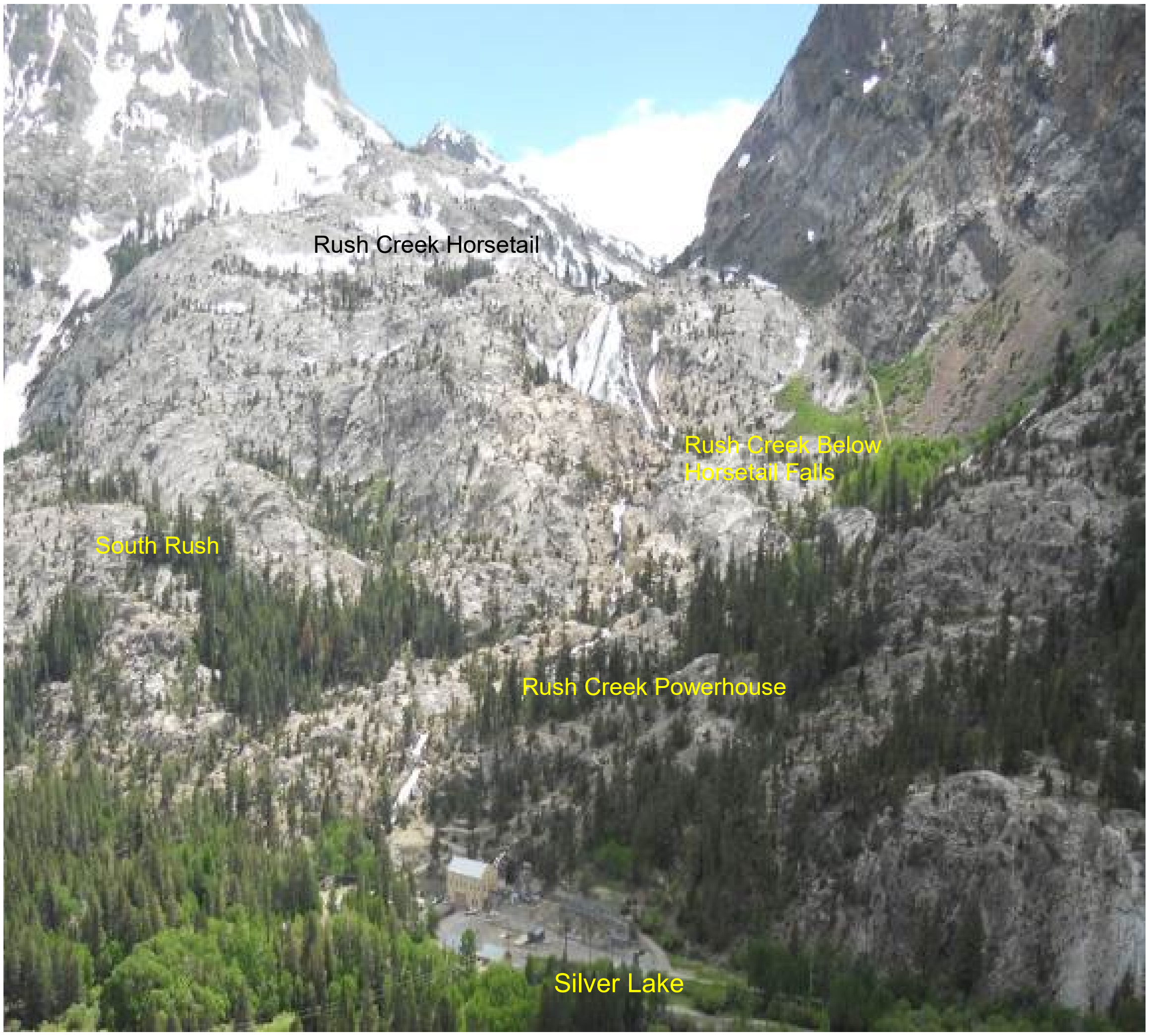




**Figure 8.7-5. Rush Creek Horsetail Falls Reach Including the South Rush Creek Distributary**

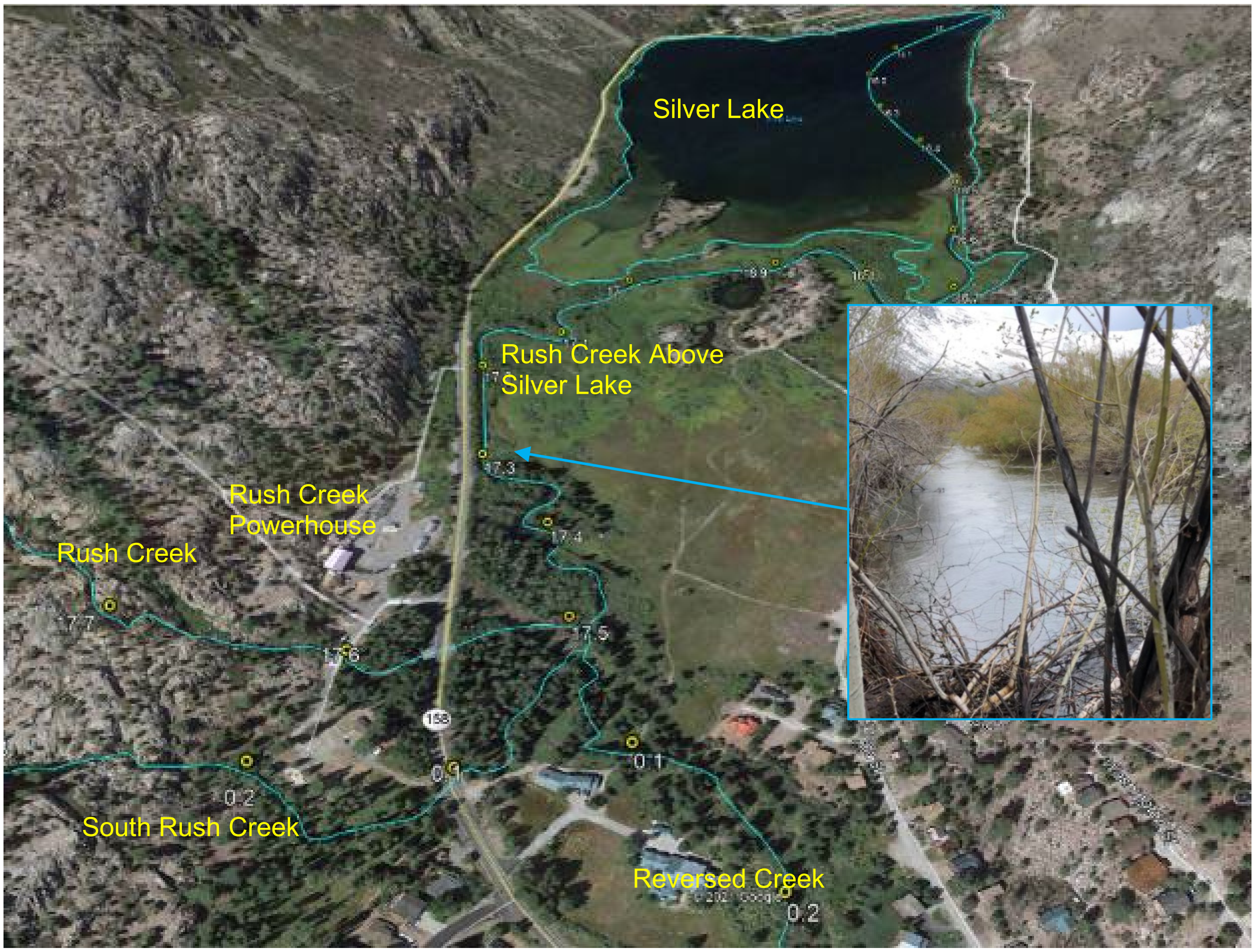
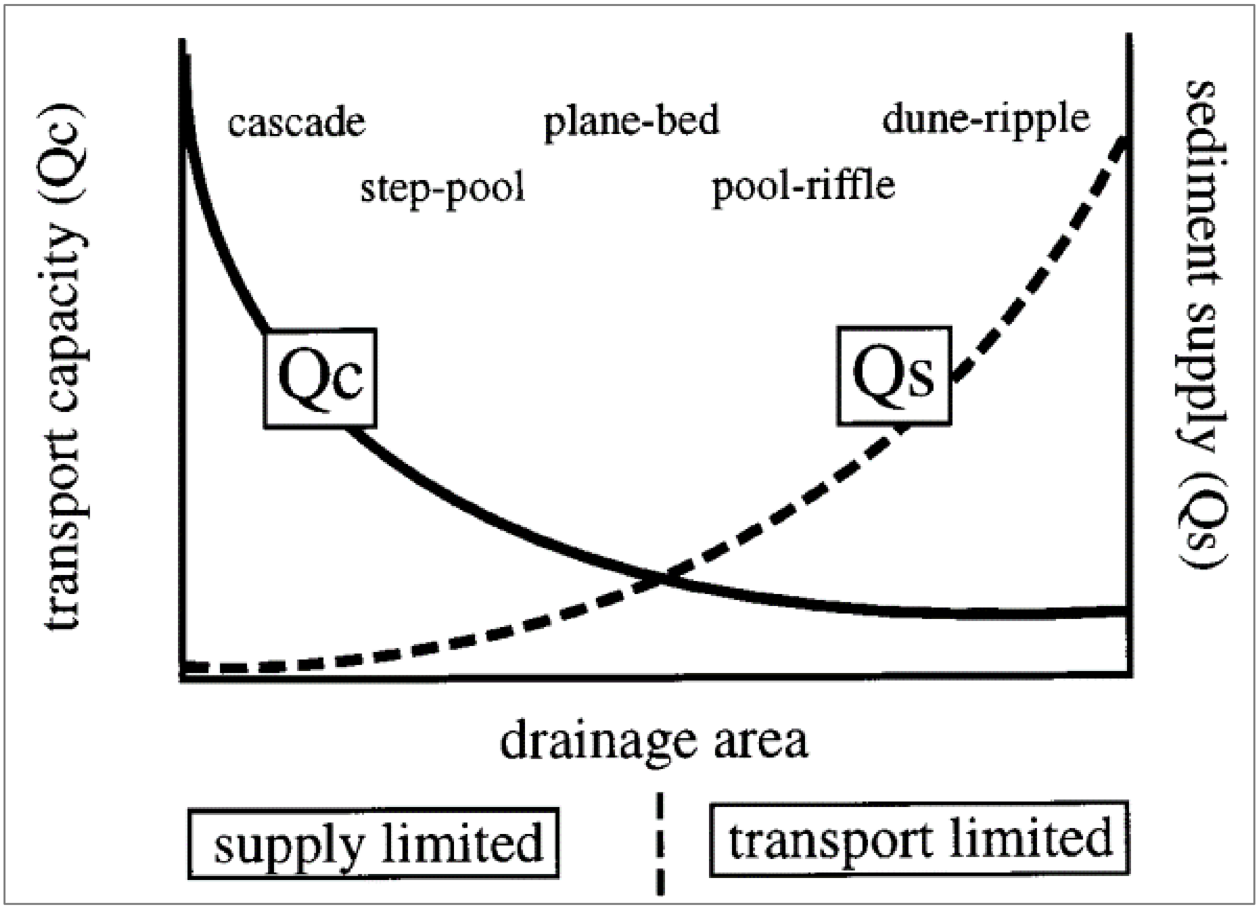



**Figure 8.7-6. Rush Creek above Silver Lake Including South Rush Creek and Reversed Creek**


**Figure 8.7-7. Google Earth Aerial Imagery Rush Creek below Silver Lake and of a Debris Flow Near Rush Creek (facing downstream) near River Mile [RM] 15.7 to RM 15.1**

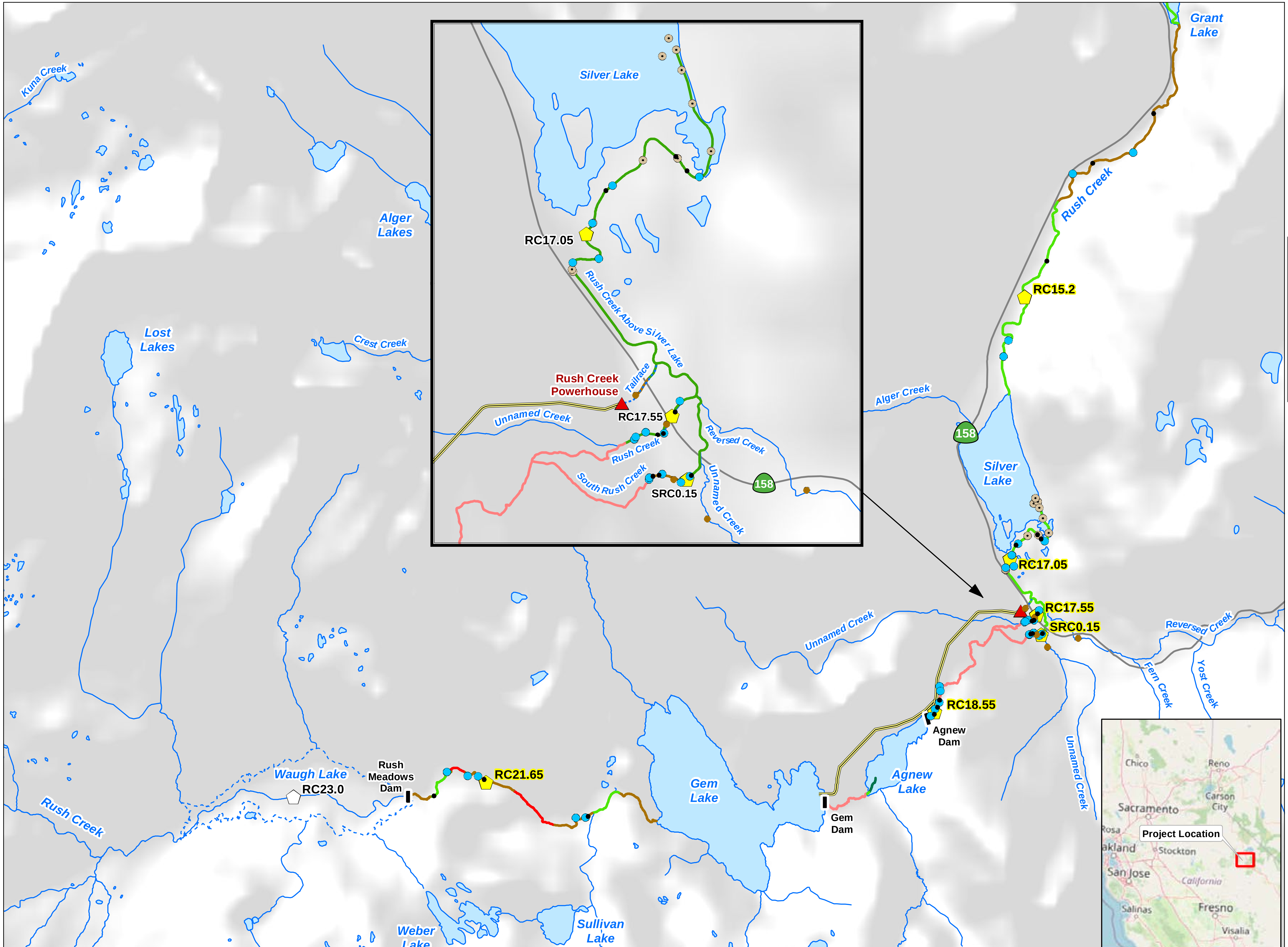
**Figure 8.7-8. Low Gradient Portion of South Rush Creek Upstream of the Highway (top) and Downstream of the Highway (bottom)**




*Source: Montgomery and Buffington 1997*

**Figure 8.7-9. Schematic Illustration of Generalized Relative Trends in Sediment Supply (Qs) and Transport Capacity (Qc) in Mountain Drainage Basins**

# MAPS




**SCE Facilities**

- Dam
- Powerhouse
- Flowline / Penstock
- Tailrace

**Other Features**

- Highway
- River/Stream
- Lake/Reservoir
- Dry Lake/Reservoir

**Study Sites and Types**

- Geomorphology Survey Location (General)
- Geomorphology Survey Location (to be completed in 2024)
- Transect and Pebble Count Sampling Location
- V* Fine Sediment Assessment Location
- Spawning Gravel Sampling Location
- Streambed Core Sampling Location
- Suspended Sediment Sampling Location

**Rosgen L1 Classification**

- A
- Aa+
- B
- C
- D

SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead℠

Rush Creek Project (FERC 1389)

**Map 8.7-1**

**Geomorphology Study Sites**

N W E S

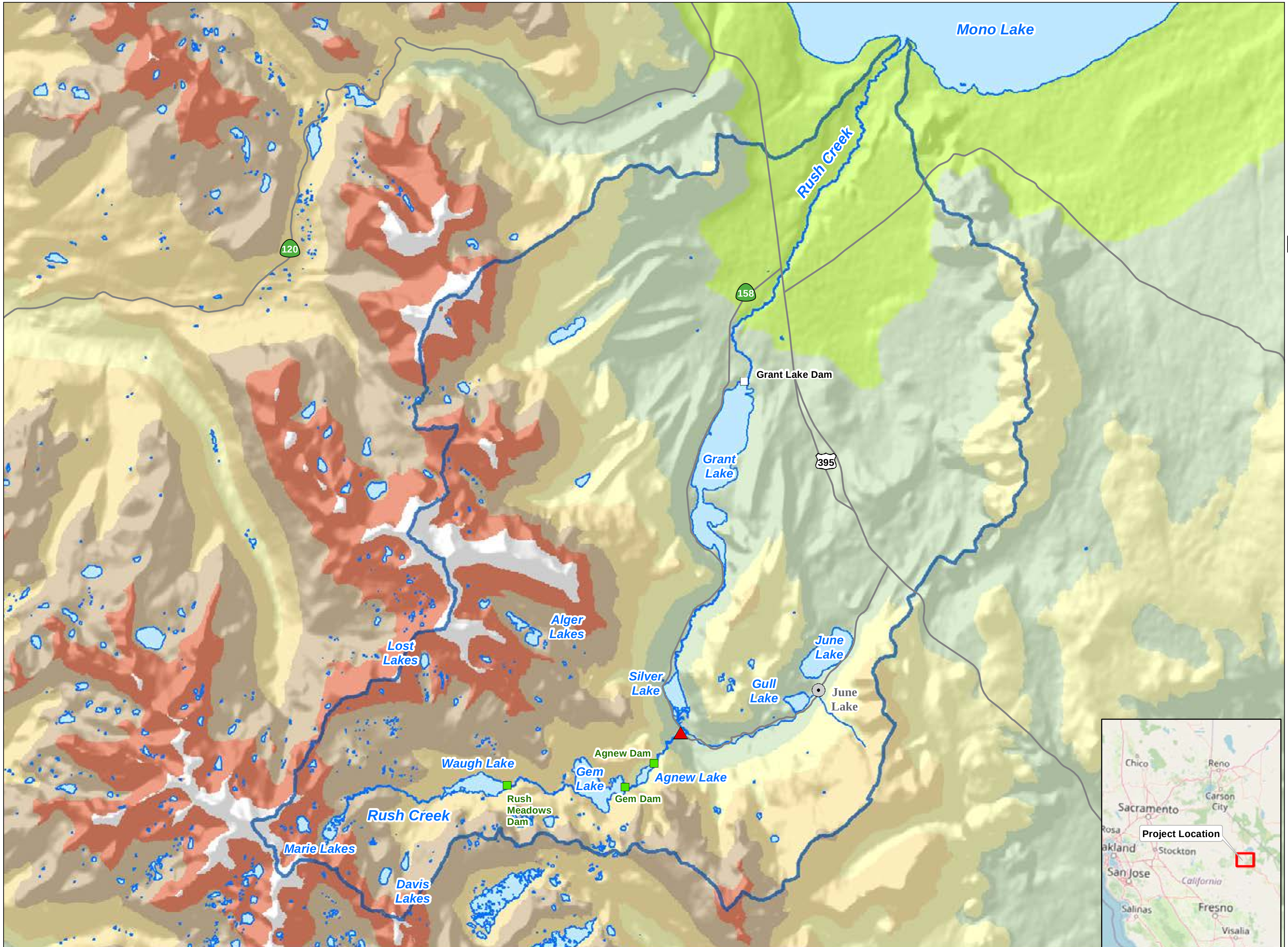
0 0.25 0.5 Miles

**Date: 7/1/2024**

**Projection: UTM Zone 11**
**Datum: NAD 83**



C:\GIS\237800343\map\Rush Creek\GeoMaps\SCE_RUSH_CREEK_Geomorph_StudySites_17i11i_03.mxd




SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead℠

Rush Creek Project (FERC 1389)

**Map 8.7-2**

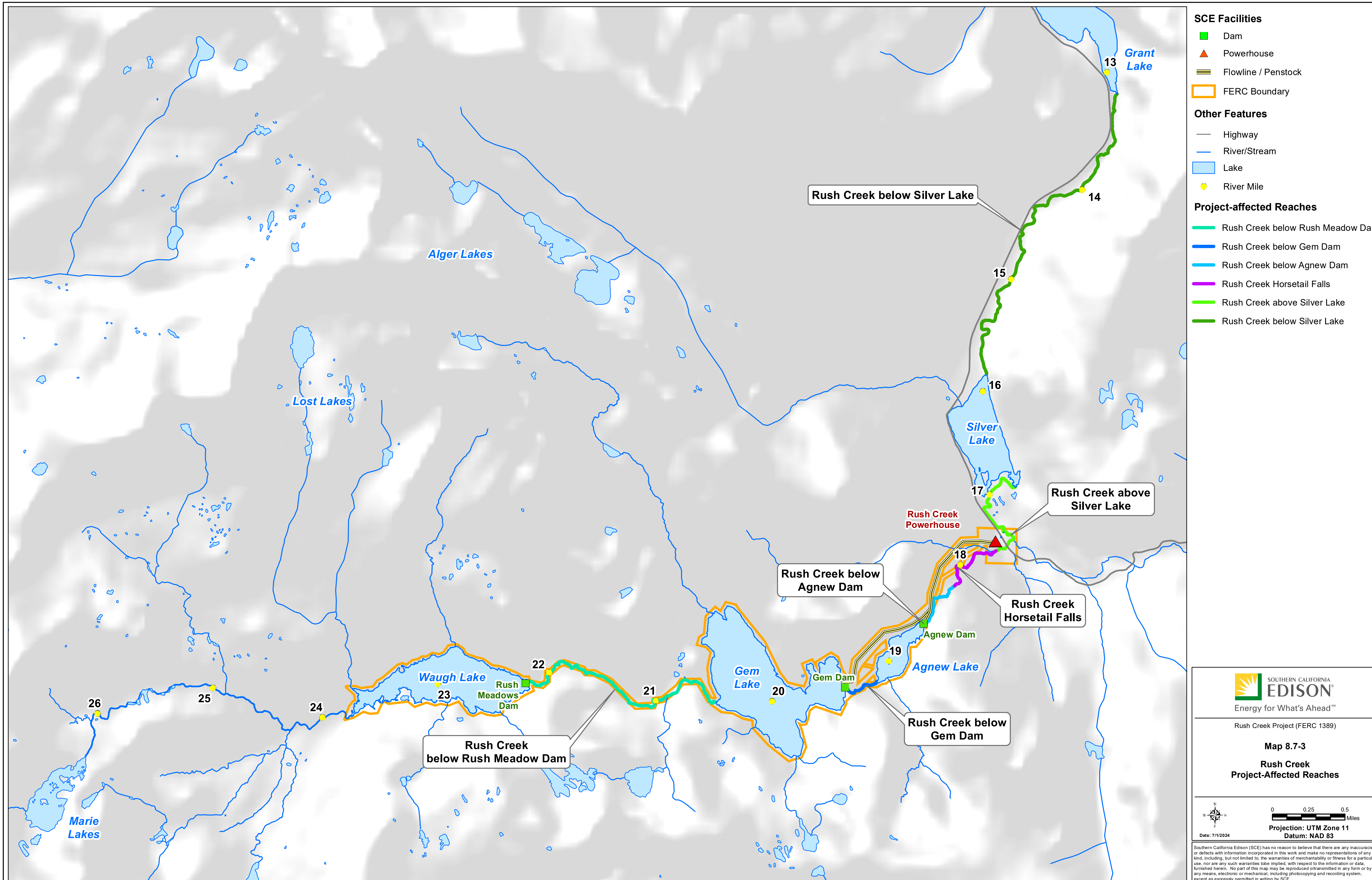
**Topography in the Rush Creek Watershed**

Date: 7/1/2024

Projection: UTM Zone 11
Datum: NAD 83



C:\GIS\237800343\map\Rush Creek\GeoMaps\SCE_RUSH_CREEK_Topo_17i11i_01.mxd

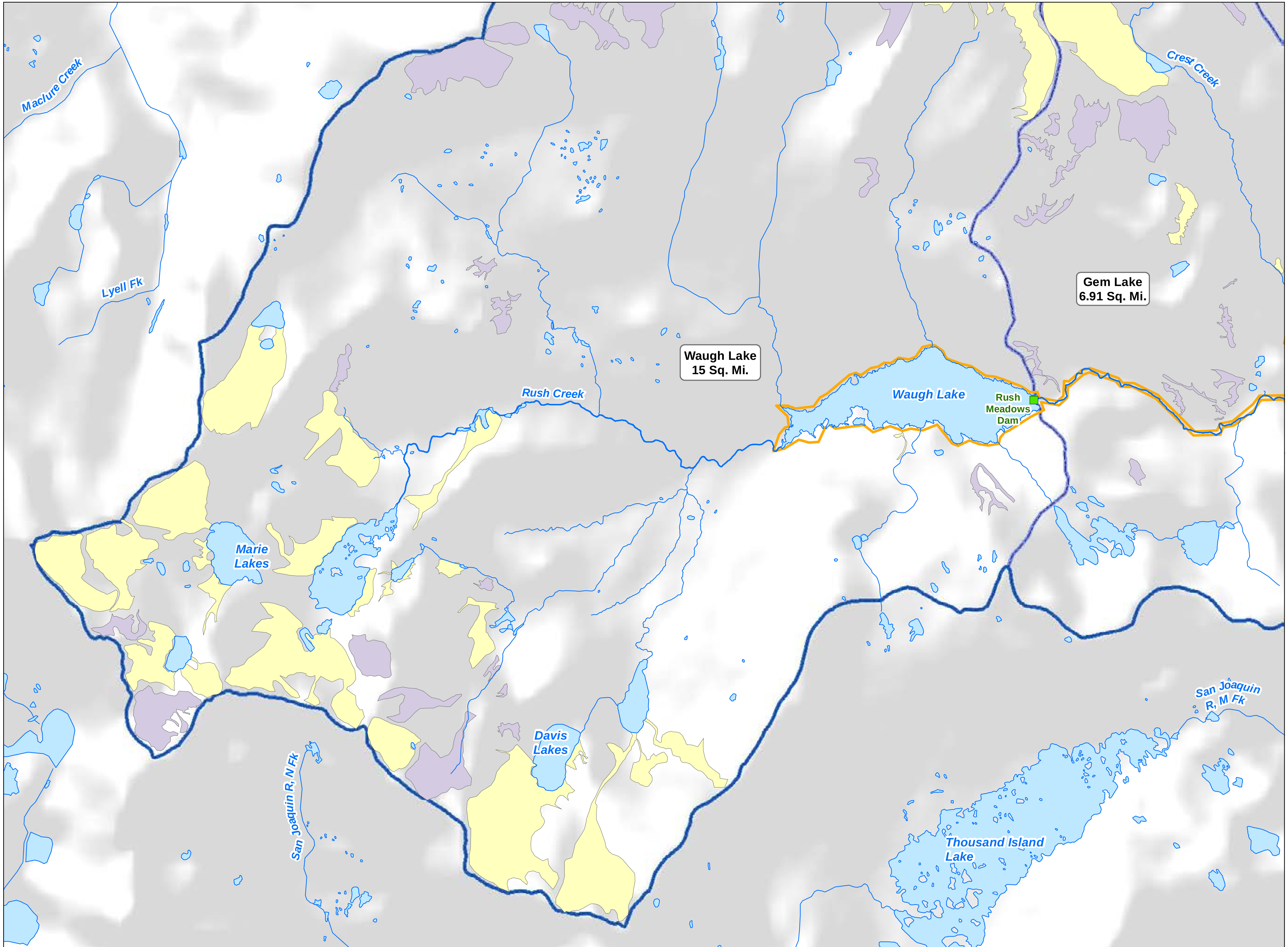



**Map 8.7-3**

**Rush Creek Project-Affected Reaches**



C:\GIS\237800343\map\Rush Creek\GeoMaps\SCE_RUSH_CREEK_ProjAffReaches_17i11i_02.mxd




**SCE Facilities**

Dam
Powerhouse

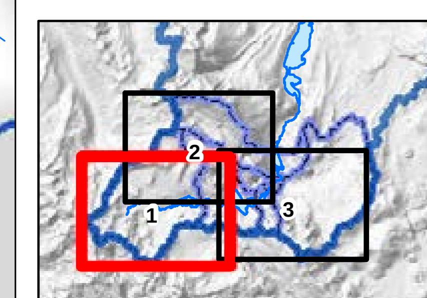
**Other Features**

Highway
FERC Boundary
River/Stream
Lake/Reservoir
Drainage Basins
Rush Creek Watershed Boundary

**Mass Wasting Areas**

**Sediment Recruitment**

Hillslope Storage
Direct Sediment Delivery to Waterways
Direct Sediment Delivery to Waterways with Unimpeded Connection to Silver Lake




Rush Creek Project (FERC 1389)

**Map 8.7-4a**

**Mass-Wasting Sites in the Western Portion of the Study Area**

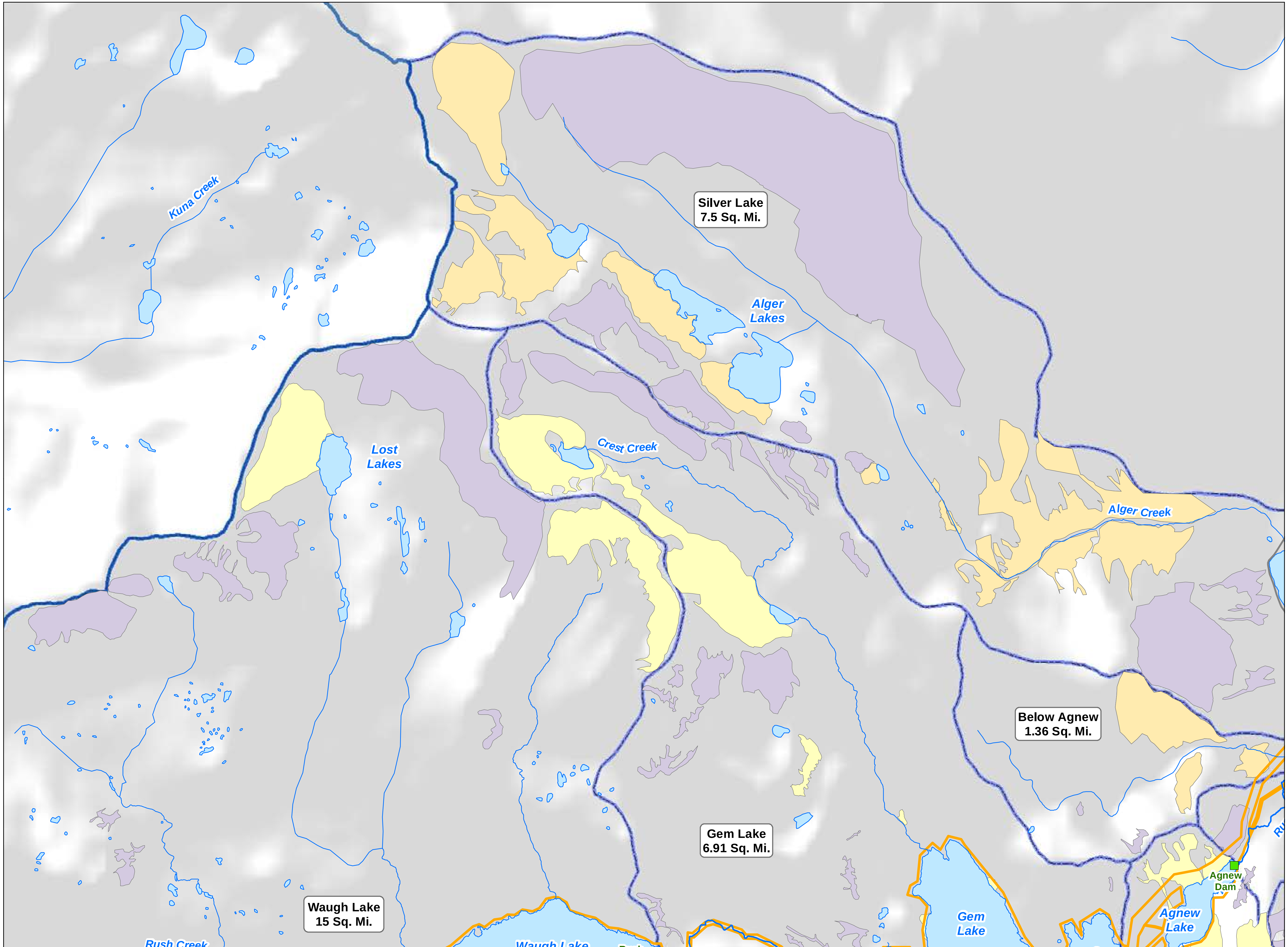
0 500 1,000 2,000 Feet

Date: 7/1/2024

**Projection: UTM Zone 11**
**Datum: NAD 83**



C:\GIS\237800343\map\Rush Creek\GeoMaps\SCE_RUSH_CREEK_MassWasting_17i11i_02_NoPolyIDs.mxd




**SCE Facilities**

Dam

Powerhouse

**Other Features**

Highway

FERC Boundary

River/Stream

Lake/Reservoir

Drainage Basins

Rush Creek Watershed Boundary

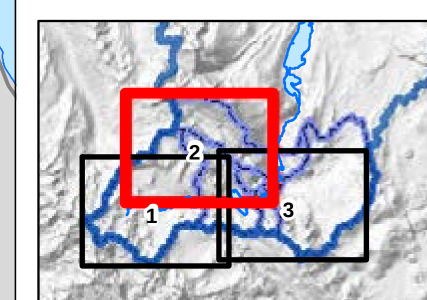
**Mass Wasting Areas**

**Sediment Recruitment**

Hillslope Storage

Direct Sediment Delivery to Waterways

Direct Sediment Delivery to Waterways with Unimpeded Connection to Silver Lake




SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead℠

Rush Creek Project (FERC 1389)

**Map 8.7-4b**

**Mass-Wasting Sites in the Northern Portion of the Study Area**

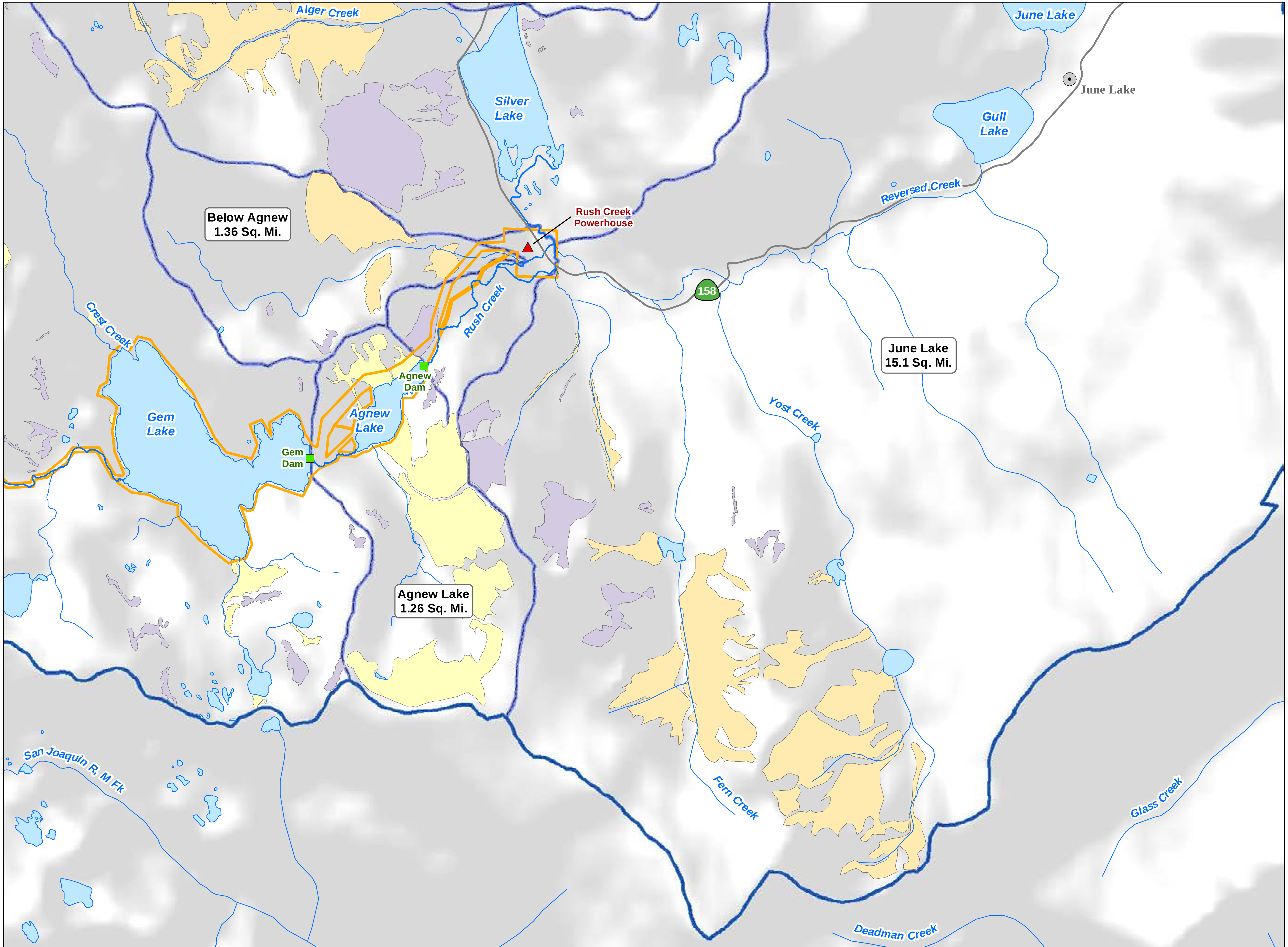
0 500 1,000 2,000 Feet

**Date: 7/1/2024**

**Projection: UTM Zone 11**
**Datum: NAD 83**



C:\GIS\237800343\map\Rush Creek\GeoMaps\SCE_RUSH_CREEK_MassWasting_17i11i_02_NoPolyIDs.mxd




**SCE Facilities**

- Dam
- Powerhouse

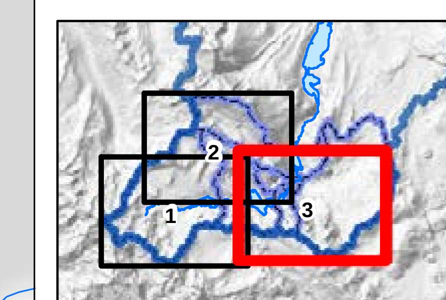
**Other Features**

- Highway
- FERC Boundary
- River/Stream
- Lake/Reservoir
- Drainage Basins
- Rush Creek Watershed Boundary

**Mass Wasting Areas**

**Sediment Recruitment**

- Hillslope Storage
- Direct Sediment Delivery to Waterways
- Direct Sediment Delivery to Waterways with Unimpeded Connection to Silver Lake




SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead

Rush Creek Project (FERC 1389)

**Map 8.7-4c**

**Mass-Wasting Sites in the Eastern Portion of the Study Area**

Date: 7/1/2024

0 500 1,000 2,000 Feet

**Projection: UTM Zone 11**
**Datum: NAD 83**



C:\GIS\237800343\map\Rush Creek\GeoMaps\SCE_RUSH_CREEK_MassWasting_17i11i_02_NoPolyIDs.mxd

## TABLE OF CONTENTS

Page

8.8 Wetland, Riparian, and Littoral Habitats ........ 8.8-1
8.8.1 Information Sources ........ 8.8-1
8.8.2 Project Reservoirs and Silver Lake ........ 8.8-3
8.8.2.1 Waugh Lake ........ 8.8-3
8.8.2.2 Gem Lake ........ 8.8-6
8.8.2.3 Agnew Lake ........ 8.8-8
8.8.2.4 Silver Lake ........ 8.8-10
8.8.3 Project-affected Stream Segments ........ 8.8-11
8.8.3.1 Rush Creek Below Rush Meadows Dam ........ 8.8-11
8.8.3.2 Rush Creek Below Gem Dam ........ 8.8-12
8.8.3.3 Rush Creek Below Agnew Dam ........ 8.8-12
8.8.3.4 Rush Creek Horsetail Falls ........ 8.8-13
8.8.3.5 Rush Creek Above Silver Lake ........ 8.8-13
8.8.3.6 Rush Creek Below Silver Lake ........ 8.8-14
8.8.3.7 South Rush Creek ........ 8.8-14
8.8.4 Plant and Wildlife Species that Use Wetland and Riparian Habitats ........ 8.8-15
8.8.5 References ........ 8.8-15

## LIST OF TABLES

Table 8.8-1. Project-affected Stream Segments, Project Reservoirs, Silver Lake, and Selected Riparian Sampling Sites ........ 8.8-19

Table 8.8-2. Manual of California Vegetation (MCV) Riparian Alliances Along Rush Creek Project-affected Stream Segments, Project Reservoirs and Silver Lake ........ 8.8-20

Table 8.8-3. Acres of MCV Riparian Alliances by Project-affected Stream Segment, Project Reservoir, and Silver Lake ........ 8.8-21

Table 8.8-4. Summary of Riparian Data Collected at Selected Riparian Sampling Sites ........ 8.8-22

Table 8.8-5. Total Species Richness of Graminoids, Herbs, Shrubs, and Trees Within the Historic Inundation Zones (Littoral Habitats) of Project Reservoirs ........ 8.8-23

Table 8.8-6. Riparian and Wetland Special-Status Plants, Invasive Plants, and Special-Status Wildlife Known to Occur or Potentially Occurring Along the Project-Affected Stream Segments, Project Reservoirs, and Silver Lake ........ 8.8-24

## LIST OF FIGURES

Figure 8.8-1. Tree Species Identified from Stump Samples Within the Historic Inundation Zones (Littoral Habitats) of Project Reservoirs. .......... 8.8-33

Figure 8.8-2. Average Percent Cover of Graminoids, Herbs, Shrubs, and Trees in Plots Across Historic Reservoir Inundation Zones.......... 8.8-34

Figure 8.8-3. Shrub Height Compared Between Plots in the Historic Inundation Zone and Above Historic Ordinary High Water Mark .. 8.8-35

## LIST OF MAPS

Map 8.8-1a. Riparian Vegetation Alliances on Project-affected Stream Segments, Project Reservoirs, and Silver Lake ........ 8.8-37

Map 8.8-1b. Riparian Vegetation Alliances on Project-affected Stream Segments, Project Reservoirs, and Silver Lake ........ 8.8-38

Map 8.8-1c. Riparian Vegetation Alliances on Project-affected Stream Segments, Project Reservoirs, and Silver Lake ........ 8.8-39

Map 8.8-1d. Riparian Vegetation Alliances on Project-affected Stream Segments, Project Reservoirs, and Silver Lake ........ 8.8-40

Map 8.8-1e. Riparian Vegetation Alliances on Project-affected Stream Segments, Project Reservoirs, and Silver Lake ........ 8.8-41

Map 8.8-1f. Riparian Vegetation Alliances on Project-affected Stream Segments, Project Reservoirs, and Silver Lake ........ 8.8-42

Map 8.8-1g. Riparian Vegetation Alliances on Project-affected Stream Segments, Project Reservoirs, and Silver Lake ........ 8.8-43

Map 8.8-2. Riparian Vegetation Alliances on Rush Creek and South Rush Creek ........ 8.8-44

## LIST OF ACRONYMS

| | |
|---|---|
| CALVEG | Classification and Assessment with LANDSAT of Visible Ecological Groupings |
| DBH | diameter at breast height |
| DSOD | Division of Safety of Dams |
| FERC | Federal Energy Regulatory Commission |
| Forest Service | United States Department of Agriculture – Forest Service |
| GIS | Geographic Information Systems |
| MCV | Manual of California Vegetation |
| OHWM | Ordinary High Water Mark |
| Project | Rush Creek Project |
| RM | river mile |
| SCE | Southern California Edison Company |
| SD A | Supporting Document A |
| TSR | Technical Study Report |

## 8.8 WETLAND, RIPARIAN, AND LITTORAL HABITATS

This section describes riparian resources along Project-affected stream segments, 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.

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).

Riparian and wetland habitats along the Project-affected stream segments, Project reservoirs, and Silver Lake provide habitat for a variety of amphibians, wildlife, and avian species. Riparian corridors provide valuable habitat for many species, including nesting birds, and provide value as cover near water sources and travel corridors for a multitude of wildlife species. Special-status plants and wildlife that may occur in or use riparian areas are discussed in Section 8.5, Botanical and Wildlife Resources. Fish are described in Section 8.4, Fish and Aquatic Resources.

Hydrology and geomorphology information pertinent to the discussion of riparian resources are summarized in this section. Detailed information on hydrology and geomorphology are discussed in Sections 8.2, Water Use and Hydrology and 8.7, Geomorphology, respectively.

### 8.8.1 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, Federal Energy Regulatory Commission [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).

- Analysis of Riparian Vegetation: 2022 Field Season and Comparison to Previous Years (E Read and Associates, Inc. 2023).

The following sources were used to develop maps and to characterize and quantify the acres of wetland and riparian habitats in the study area:

- Draft TERR 1 – Botanical Resources Technical Study Report (TERR 1 – TSR) (SCE 2024a), which is included in Supporting Document A (SD A); and

- Draft TERR 2 – Wildlife Resources Technical Study Report (TERR 2 – TSR) (SCE 2024b), which is included in SD A.

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 segments and the littoral zones associated with Project reservoirs and Silver Lake. Refer to Table 8.8-1 for a list of Project-affected stream segments, Project reservoirs, Silver Lake, as well as selected riparian sampling sites.

A discussion of the floodplains and littoral zones of all Project reservoirs and Silver Lake is provided in Section 8.8.2, below. A discussion of the floodplains associated with Project-affected stream segments is provided in Section 8.8.3.

### 8.8.2 Project Reservoirs and Silver Lake

Riparian and wetland habitats along Project reservoirs and Silver Lake were mapped as part of implementation of TERR 1 – TSR field surveys in 2023 (SCE 2024a, SD A). Maps 8.8-1a through 8.8-1g display existing information on the spatial extent of riparian habitats in the vicinity of the Project. Field surveys were conducted at Waugh Lake to provide a more detailed assessment of the riparian communities within the recently exposed historic inundation zone. Table 8.8-2 provides a description of Manual of California Vegetation (MCV) riparian habitat types occurring in vicinity of the Project (Sawyer et al. 2009), and a cross-reference with United States Forest Service (Forest Service) Classification and Assessment with land satellite of Visible Ecological Groupings (CALVEG) alliances (Forest Service 2018).

This section provides a description of the floodplains (including riparian and wetland habitats) and littoral zones associated with Project reservoirs and Silver Lake.

#### 8.8.2.1 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 a shoreline perimeter of 4.40 miles and a water surface area of 130 acres. A description of floodplain (including riparian vegetation) and littoral habitats within the historic inundation zone of Waugh Lake is provided below.

**Floodplain Habitats**

There is 0.68 acre of riparian habitat along Waugh Lake in the study area (refer to Table 8.8-3). Fully developed riparian communities (i.e., containing mature age classes and visible on aerial imagery) are mostly confined to the floodplains of tributary streams that drain into Waugh Lake. Two MCV riparian alliances were recorded along this portion of the study area, the *Salix orestera* Shrubland Alliance (Sierra Gray Willow Thickets) and the *Salix boothii* – *Salix geyeriana* – *Salix lutea* Shrubland Alliance (Booth's Willow – Geyer's Willow – Yellow Willow Thickets). The *Salix orestera* Shrubland Alliance was observed along the outlet of Rush Creek into Waugh Lake, while *Salix boothii* – *Salix geyeriana* – *Salix lutea* Shrubland Alliance (characterized by yellow willow) was mostly observed on smaller un-named tributary drainages into Waugh Lake.

Since Rush Meadows Dam has been notched, the historic streambed of Waugh Lake has been exposed, with the reservoir reverting to a more stream-like system in dry water years and/or late in the season. During years of high runoff and snowmelt, Waugh Lake can fill nearly to the original reservoir capacity because more water outlets into Waugh Lake than can be released from the spillway and the outlet.

Due to this hybrid stream/reservoir dynamic, a decision was made to sample riparian vegetation within the historic inundation zone of Waugh Lake in September 2023, similar to sampling conducted at the Project-affected stream segments described in Section 8.8.3 (SCE 2024a, SD A). Refer to Table 8.8-4 for summary metrics collected at Waugh Lake during 2023 surveys (SCE 2024a, SD A).

Compared to other portions of the study area (refer to Project-affected segments in Section 8.8.3), Waugh Lake has the lowest percent cover of woody riparian trees/shrubs (SCE 2024a, SD A). Most of the exposed soils within the historic inundation zone are barren and unvegetated. Vegetation within the exposed reservoir bed included young yellow willow and lodgepole pine seedlings at low cover, as well as herbaceous and graminoid species such as sedges (*Carex* spp.), rushes (*Juncus* spp.), and grasses (Poaceae) (graminoids were more abundant than herbaceous species). Therefore, riparian habitat in Waugh Lake is in an early successional state, likely because of the short growing season at high elevation and the pattern of episodic inundation.

## Littoral Habitats

For the purposes of this document, the littoral zone is defined to include habitats that fall within the historic inundation zones of Waugh Lake. When Rush Meadows Dam was constructed, the reservoir bed was at least partially vegetated. After approximately one century of consistent inundation, the inundated reservoir bed was barren and unvegetated. Since the time of the seismic restrictions, some portions of the historic inundation zone have been exposed, but still experience periodic inundation depending on the water year type. As a result, habitats in some portions of the reservoir bed are gradually transitioning from littoral to either riparian (along tributary drainages within the historic streambed) or upland habitats (in more open areas), but mostly vegetation is an early successional state and bare substrates still predominate the landscape.

As part of the TERR 1 – TSR (SCE 2024a, SD A), both historic (e.g., tree stumps) and existing botanical resources were sampled within the historic inundation zone of Project reservoirs.

A summary of historic and existing botanical resources within the historic inundation zone of Waugh Lake is provided below.

### *Historic Botanical Resources*

Waugh Lake has a wide distribution of tree stumps within the historic inundation zone, indicating that prior to construction of Rush Meadows Dam, much of the reservoir bed was forested. Of 18 stump cross-section samples taken during studies in 2023 (SCE 2024a, SD A), most were lodgepole pine or unknown pine species (*Pinus* spp.), with a few mountain hemlock (*Tsuga mertensiana*). Refer to Figure 8.8-1 for the species determinations for stumps observed within the historic inundation zone of Project reservoirs.

*EXISTING BOTANICAL RESOURCES*

Nine transects were sampled in 2023 to characterize existing botanical resources within the historic inundation zone of Waugh Lake (SCE 2024a, SD A). Transects were sampled using 5-meter by 5-meter sampling plots placed along the transect from the current waterline to the top of the historic ordinary high water mark (OHWM) of the reservoir.

A description of existing botanical resources observed within the historic inundation zone transects in 2023 is provided below, including species richness, percent cover, and information on shrub height and the diameter at breast height (DBH) of trees. Plant species were categorized in graminoids, herbs, shrubs, and trees to better understand patterns in vegetative structure.

*Species Richness* – Species richness is defined as the total number of species observed across all transects. Since the seismic restrictions were implemented, the newly exposed shoreline of Waugh Lake has been partially colonized by herbaceous species, with high species richness but no dominant species (SCE 2024a, SD A). Refer to Table 8.8-5 for the species richness of graminoids, herbs, shrubs, and trees observed within Waugh Lake during studies conducted in 2023 (SCE 2024a, SD A). A total of 97 species were observed in 2023 (SCE 2024a, SD A), the majority of which are native plant species. No non-native species that are considered invasive by Inyo National Forest were observed.

When comparing differences in species categories between the reservoirs, Waugh Lake has a higher species richness of graminoids and herbs than either Gem or Agnew lakes, but a lower species richness of shrubs. Tree species richness was similar across all the reservoirs.

*Percent Cover* – Percent cover is defined as the total cover of graminoids, herbs, shrubs, and trees averaged across all sampling plots and transects. When comparing differences in species categories within Waugh Lake, graminoids and herbs had higher average cover than shrubs and trees in Waugh Lake. Though species richness in Waugh Lake is high, the average vegetative cover within each plot was relatively low, with most plots containing a significant proportion of bare substrates. Refer to Figure 8.8-2 for the average percent cover of graminoids, herbs, shrubs, and trees in plots sampled within the Waugh Lake historic reservoir inundation zone.

*Shrub Height and Tree DBH* – Shrub height and tree DBH were measured to provide information on the age structure of woody vegetation in the historic inundation zone. Willows (*Salix* spp.) and lodgepole pines are gradually colonizing these areas, but all in the youngest (seedling and sapling) age classes and at low percent cover (SCE 2024a, SD A).

Shrub heights are significantly lower within the historic inundation zone of Waugh Lake compared to plots sampled above the historic OHWM (refer to Figure 8.8-3). Yellow willow was the predominant shrub species observed in the historic inundation zone of Waugh Lake.

Any trees observed in the historic inundation zone were primarily seedlings and saplings, and none of the trees observed were greater than 1-inch DBH. Lodgepole pine were the predominant tree species observed in the historic inundation zone of Waugh Lake.

#### 8.8.2.2 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 perimeter is 4.63 miles (with the increase resulting from a less uniform shoreline and the appearance of islands) and the water surface area is 256 acres. A description of floodplain (including riparian vegetation) and littoral habitats within the historic inundation zone of Gem Lake is provided below.

**Floodplain Habitats**

There is 0.94 acre of riparian habitat along Gem Lake in the study area (refer to Table 8.8-3).

Fully developed riparian communities (i.e., containing mature age classes and visible on aerial imagery) are mostly confined to the floodplains of tributary streams that drain into Gem Lake. Two MCV riparian alliances were recorded along this portion of the study area — *Salix lemmonii* Shrubland Alliance (Lemmon's Willow Thickets) and *Salix boothii* – *Salix geyeriana* – *Salix lutea* Shrubland Alliance (Booth's Willow – Geyer's Willow – Yellow Willow Thickets).

**Littoral Habitats**

For the purposes of this document, the littoral zone is defined to include habitats that fall within the historic inundation zones of Gem Lake. When Gem Dam was constructed, the reservoir bed was at least partially vegetated. After approximately one century of consistent inundation, the inundated reservoir bed was barren and unvegetated. Since the time of the seismic restrictions (FERC 2016), some portions of the historic inundation zone have been exposed, but still experience periodic inundation depending on the water year type. As a result, habitats in some portions of the reservoir bed are gradually transitioning from littoral to either riparian (along tributary drainages within the historic streambed) or upland habitats (in more open areas), but in an early successional state and bare substrates still predominate the landscape.

As part of the TERR 1 – TSR (SCE 2024a, SD A), both historic (e.g., tree stumps) and existing botanical resources were sampled within the historic inundation zone of Project reservoirs.

A summary of historic and existing botanical resources within the historic inundation zone of Waugh Lake is provided below.

*HISTORIC BOTANICAL RESOURCES*

Tree stumps within the historic inundation zone of Gem Lake are mostly distributed along tributary streams and outside of rocky outcrop areas that dominate the shoreline of the reservoir. Of 15 stump cross-section samples taken during studies in 2023 (SCE 2024a, SD A), most were western juniper (*Juniperus occidentalis*). Mountain hemlock, lodgepole pine, Jeffery pine (*Pinus jeffreyi*), and unknown pine were also recorded. It is expected that juniper was the dominant species identified in Gem Lake through cross-section samples because *Juniperus* wood degrades more slowly (i.e., the wood is denser and more fibrous) than other tree species in the surrounding forest community. Refer to Figure 8.8-1 for the species of trees observed within the historic inundation zone of Project reservoirs.

*EXISTING BOTANICAL RESOURCES*

Six transects were sampled in 2023 to characterize existing botanical resources within the historic inundation zone of Gem Lake (SCE 2024a, SD A). Transects were sampled using 5-meter by 5-meter sampling plots placed along the transect from the current waterline to the top of the historic OHWM of the reservoir.

A description of existing botanical resources observed in the historic inundation zone in 2023 is provided below, including species richness, percent cover, and information on shrub height and the DBH of trees.

*Species Richness* – Since implementation of the seismic restriction, the newly exposed shoreline has been partially colonized by vegetation in an early successional state (SCE 2024a, SD A). Refer to Table 8.8-5 for the species richness of graminoids, herbs, shrubs, and trees observed within Gem Lake during studies conducted in 2023 (SCE 2024a, SD A). A total of 81 species were observed in 2023 (SCE 2024a, SD A), the majority of which are native plant species, and no non-native species that are considered invasive by Inyo National Forest were observed. Compared to the other Project reservoirs, Gem Lake had the lowest total species richness.

When comparing differences in species categories between the reservoirs, Gem Lake had a similar species richness of graminoids and herbs to Agnew Lake, but both were lower than Waugh Lake. Gem Lake had a higher species richness of shrubs than Waugh Lake, but less than Agnew Lake. Tree species richness was similar across all Project reservoirs.

*Percent Cover* – Overall vegetative cover of graminoids, herbs, shrubs, and trees was relatively low within the historic inundation zone of Gem Lake (each species category averaged <20 percent). Refer to Figure 8.8-2 for the average percent cover of graminoids, herbs, shrubs, and trees in plots sampled within Gem Lake's historic reservoir inundation zones.

When comparing species categories across reservoirs, the average cover of shrubs was slightly higher than Waugh Lake but was much less than Agnew Lake. Graminoid, herb, and tree cover was lower than the other reservoirs.

*Shrub Height and Tree DBH* – Willows, quaking aspen, lodgepole pines are gradually colonizing the historic inundation zones, but all were observed to be in the youngest (seedling and sapling) age classes (SCE 2024*a*, SD A).

Shrub heights are significantly lower within the historic inundation zone of Gem Lake compared to plots sampled above the historic OHWM. Willows and red buckthorn (*Frangula rubra*) were the predominant species observed within the historic inundation zone of Gem Lake.

Trees observed in the historic inundation zone were primarily seedlings and saplings, and none of the trees observed were greater than 1-inch DBH. Lodgepole pine and quaking aspen were the predominant species observed within the historic inundation zone of Gem Lake.

### 8.8.2.3 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 perimeter 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 perimeter of 1.24 miles, and a water surface area of 23 acres. A description of floodplain (including riparian vegetation) and littoral habitats within the historic inundation zone of Agnew Lake is provided below.

**<u>Floodplain Habitats</u>**

There are 2.68 acres of riparian habitat both within and along the historic OHWM of Agnew Lake in the study area (refer to Table 8.8-3).

In contrast to Waugh and Gem lakes, mid-successional riparian vegetation has recolonized some areas of the historic inundation zone that contain shallower slopes with sediment deposits. Areas containing steep rocky talus are still mostly unvegetated. Willows of both young and medium age classes were observed within such patches within the historic inundation zone (refer to the littoral habitat discussion below). The riparian community within the historic inundation zone is dominated by *Salix exigua* Shrubland Alliance (Sandbar [Narrowleaf] Willow Thickets). At the upstream end of Agnew Lake, where Rush Creek and another perennial stream drainage form an alluvial fan, this riparian vegetation occurs within a thick band.

Above the historic OHWM, there is also fully developed *Salix boothii – Salix geyeriana – Salix lutea* Shrubland Alliance (Booth's Willow – Geyer's Willow – Yellow Willow Thickets) along Rush Creek and the perennial stream drainage, but above the historic OHWM of Agnew Lake. This alliance is dominated by yellow willow.

## Littoral Habitats

For the purposes of this document, the littoral zone is defined to include habitats that fall within the historic inundation zones of Agnew Lake. When Agnew Dam was constructed, the reservoir bed was at least partially vegetated. After approximately one century of consistent inundation, the inundated reservoir bed was barren and unvegetated. Since the time of the seismic restrictions, some portions of the historic inundation zone have been exposed, but still experience periodic inundation depending on the water year type. As a result, habitats in some portions of the reservoir bed are gradually transitioning from littoral to either riparian (along tributary drainages within the historic streambed) or upland habitats (in more open areas). As described above under floodplain habitats, some of this riparian vegetation that has recolonized the historic inundation zone has matured beyond the seedling and sapling phase and has established continuous stands that are visible on the aerial imagery.

As part of the TERR 1 – TSR (SCE 2024a, SD A), both historic (e.g., tree stumps) and existing botanical resources were sampled within the historic inundation zone of Project reservoirs.

A summary of historic and existing botanical resources within the historic inundation zone of Agnew Lake is provided below.

### *Historic Botanical Resources*

Tree stumps within the historic inundation zone of Agnew Lake are mostly distributed along the northeast portion of the reservoir. Of 16 stump cross-section samples taken during studies in 2023 (SCE 2024a, SD A), most were Jeffrey pine. Western juniper, western white pine, and unknown pine were also recorded. Refer to Figure 8.8-1 for the species of trees observed within the historic inundation zone of Project reservoirs.

### *Existing Botanical Resources*

SCE established five transects along the shoreline of Agnew Lake in 2023 (SCE 2024a, SD A). Transects were sampled using 5-meter by 5-meter sampling plots placed along the transect from the current waterline to the top of the historic OHWM of the reservoir.

A description of existing botanical resources observed in the historic inundation zone in 2023 is provided below, including species richness, percent cover, and information on shrub height and the DBH of trees.

*Species Richness* – With 84 total species observed, Agnew Lake contains higher species richness than Gem Lake, but lower species richness than Waugh Lake (SCE 2024a, SD A). Refer to Table 8.8-5 for the species richness of graminoids, herbs, shrubs, and trees observed within Agnew Lake during studies conducted in 2023 (SCE 2024a, SD A).

When comparing patterns across species categories between reservoirs, Agnew had a similar species richness of graminoids and herbs to Gem Lake, but lower richness than Waugh Lake. Species richness of shrubs was highest at Agnew Lake. Tree species richness was similar across all Project reservoirs.

*Percent Cover* – Overall vegetative cover was higher within the historic inundation zone of Agnew Lake compared to Gem and Waugh lakes. Refer to Figure 8.8-2 for the average percent cover of graminoids, herbs, shrubs, and trees in plots sampled within Waugh Lake historic reservoir inundation zones.

When comparing patterns across species categories between reservoirs, the average cover of both graminoids and shrubs within the historic inundation zone was significantly higher at Agnew Lake. The average shrub cover within the historic inundation zone was similar to plots placed above the historic OHWM, but riparian willow species, as opposed to upland shrub species, were predominant within the historic inundation zone. Refer to the discussion of floodplain habitats in Agnew Lake, above, for more information on riparian habitats.

*Shrub Height and Tree DBH* – Shrub heights were roughly equivalent within the historic inundation zone of Waugh Lake compared to plots sampled above the historic OHWM, but the species composition is different. Willows were the predominant shrub that is colonizing the historic inundation zone, with some observed in the medium age class and taller heights than shrubs at Waugh and Gem lakes (refer to Figure 8.8-3). Sandbar (narrowleaf) willow (*Salix exigua*) was the most abundant willow species observed on transects. Above the historic OHWM, upland shrub species such as bitter cherry (*Prunus emarginata*), sagebrush (*Artemisia* spp.), and snowbrush (*Ceanothus velutinus*) were most common.

Trees observed in the historic inundation zone were primarily seedlings, and none of the trees observed were greater than 1-inch DBH. Lodgepole pine and quaking aspen were the predominant species observed at Agnew Lake.

#### 8.8.2.4 Silver Lake

Silver Lake is a natural lake set in a relatively shallow basin approximately 1 river mile (RM) below Rush Creek Powerhouse which receives water from Rush Creek, Reversed Creek, Alger Creek, and other smaller local drainages. A description of the floodplain and littoral habitats associated with Silver Lake are provided below.

**Floodplain Habitats**

There are 26.80 acres of riparian habitat along the floodplain of Silver Lake in the study area (refer to Table 8.8-3).

Patches of *Salix lemmonii* Shrubland Alliance (Lemmon's willow thickets) border both Silver Lake and Rush Creek above Silver Lake. These willow thickets are interspersed with wet meadow herbaceous vegetation dominated by sedges (*Carex* spp.) and red-tinge bulrush (*Scirpus microcarpus*). *Populus tremuloides* Forest and Woodland Alliance (quaking aspen groves) lines the western edge of Silver Lake.

**Littoral Habitats**

While most of Silver Lake is deep and contains little vegetation within the littoral zone, emergent wetland vegetation has established within the OHWM of Silver Lake along the southern shoreline. This emergent vegetation gradually blends into a large wet meadow complex dominated by herbaceous vegetation and interspersed with dense willow thickets (refer to the description of riparian habitat along Rush Creek above Silver Lake in Section 8.8.3.5, below). During periods of high runoff (i.e., spring of 2017 and 2023), the entire wet meadow south of the lake to State Route 158 can become inundated with overflow from Silver Lake.

## 8.8.3 Project-affected Stream Segments

Riparian and wetland habitats along Project-affected stream segments were mapped as part of implementation of TERR 1 – TSR field surveys in 2023 (SCE 2024a, SD A). Maps 8.8-1a through 8.8-1g display existing information on the spatial extent of riparian habitats in the vicinity of the Project. Field surveys were conducted at selected representative riparian study sites within Project-affected stream segments to provide a more detailed assessment of the riparian communities. Table 8.8-2 provides a description of MCV riparian habitat types occurring in vicinity of the Project (Sawyer et al. 2009), and a cross-reference with Forest Service CALVEG alliances (Forest Service 2018).

This section provides a description of the floodplains, including riparian habitats, associated with Project-affected stream segments. Littoral habitats are not present within Project-affected stream segments.

### 8.8.3.1 Rush Creek Below Rush Meadows Dam

The Rush Creek below Rush Meadows Dam stream segment 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.

Riparian vegetation was sampled along this stream segment in August 2022 as part of the Forest Service Final 4(e) Condition No. 7 – Monitoring under the existing license (FERC 1997). A summary of the riparian vegetation characteristics is provided below. Full details, including a discussion of long-term riparian trends, are available in the 2023 monitoring report available on the FERC website (E. Read and Associates, Inc. 2023).

There are 13.89 acres of riparian habitat along Rush Creek below Rush Meadows Dam in the study area (refer to Table 8.8-3).

Riparian vegetation along Rush Creek below Rush Meadows Dam is mainly dominated by willows, with an overstory of lodgepole pine forest. The willows are best classified as the *Salix orestera* Shrubland Alliance (Sierra Gray Willow Thickets). Willows are mostly in the medium and old age classes, with few young willows recorded during surveys (E Read and Associates Inc., 2023). Other woody riparian species recorded in this riparian sampling site include mountain willow (*Salix eastwoodiae*), mountain heather (*Phyllodoce breweri*), Labrador tea (*Rhododendron columbianum*), and western blueberry (*Vaccinium uliginosum* var. *occidentale*). Herbaceous and graminoid cover is relatively low underneath the woody riparian cover. One special-status plant, mountain bentgrass (*Agrostis humilis*) (Forest Species of Conservation Concern, California Rare Plant Rank 2B.3), was observed on transect surveys conducted in 2022, but not in all sampling years (E. Read and Associates, Inc. 2023). This species was not observed during the TERR 1 surveys conducted in 2023.

### 8.8.3.2 Rush Creek Below Gem Dam

There is 0.34 acre of riparian habitat along Rush Creek below Gem Lake in the study area (refer to Table 8.8-3).

The Rush Creek below Gem Dam stream segment 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 8.8-1c). One MCV riparian alliance was recorded along this portion of the study area — *Salix boothii – Salix geyeriana – Salix lutea* Shrubland Alliance (Booth’s Willow – Geyer’s Willow – Yellow Willow Thickets), and yellow willow was the dominant species observed.

### 8.8.3.3 Rush Creek Below Agnew Dam

There is 0.66 acre of riparian habitat along Rush Creek below Agnew Dam in the study area (refer to Table 8.8-3).

The Rush Creek below Agnew Dam stream segment flows in a relatively narrow bedrock canyon, and riparian vegetation mostly occurs in a narrow strip along the bank. However, a relatively wider riparian band has established just upstream of the Agnew Flume. Riparian vegetation was sampled along this stream segment in September 2023 (SCE 2024a, SD A). Refer to Table 8.8-4 for summary metrics collected at this riparian sampling site during 2023 surveys (SCE 2024a, SD A).

Two MCV riparian alliances were recorded along this portion of the study area — *Populus tremuloides* Forest Alliance (Aspen Groves) and *Salix lasiolepis* Shrubland Alliance (Arroyo Willow Thickets). Compared to other riparian sampling sites, Rush Creek below

Agnew Dam had the highest average species richness of woody riparian species. The most abundant woody riparian species at this site included arroyo willow (*Salix lasiolepis*), narrowleaf willow, Goodding's willow (*Salix gooddingii*), and American dogwood (*Cornus sericea*). Arroyo willow and narrowleaf willows are species that are adapted to frequent disturbance and are often the first to establish on newly formed fluvial deposits (Sacchi and Price 1992, Stella et al. 2006).

#### 8.8.3.4 Rush Creek Horsetail Falls

The Rush Creek Horsetail Falls stream segment is a very high-gradient stream dominated by a waterfall with a very narrow floodplain. No riparian vegetation was observed growing along Rush Creek Horsetail Falls during surveys conducted in 2023 (SCE 2024a, SD A).

#### 8.8.3.5 Rush Creek Above Silver Lake

There are 33.95 acres of riparian habitat along Rush Creek above Silver Lake in the study area (refer to Table 8.8-3), some of which also border Silver Lake and South Rush Creek. Refer to Table 8.8-4 for summary metrics collected at the two riparian sampling sites on this stream segment during 2023 surveys (SCE 2024a, SD A).

The Rush Creek above Silver Lake Reach is a mostly 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 8.8-1e). Four MCV riparian alliances were recorded along this portion of the study area, including *Pinus contorta* spp. *murrayana* Forest and Woodland Alliance (Lodgepole Pine Forest), *Populus tremuloides* Forest and Woodland Alliance (Quaking Aspen Groves), *Salix boothii – Salix geyeriana – Salix lutea* Shrubland Alliance (Booth's Willow – Geyer's Willow – Yellow Willow Thickets), and *Salix lemmonii* Shrubland Alliance (Lemmon's Willow Thickets). Refer to Map 8.8-2 for the location of riparian alliances along Rush Creek and South Rush Creek channel upstream and downstream of the State Route 158 crossing.

Woody riparian vegetation is patchily distributed within a large wet meadow complex above Silver Lake. All age classes (young, medium, and old) were observed. Five total woody riparian tree/shrub species were recorded, including Lemmon's willow, arroyo willow, Pacific willow (*Salix lasiandra*) and Geyer's willow (*Salix geyeriana*). Lodgepole pine are intermittently scattered.

The wet meadow complex surrounding patches of woody riparian vegetation is dominated by graminoids such as lakeshore sedge (*Carex lenticularis*), woolly sedge (*Carex pellita*), Northwest Territory sedge (*Carex longate*), and panicled bulrush (*Scirpus macrocarpus*). The substrate is characterized by a thick organic horizon, which abruptly transitions into the deep channel of Rush Creek, which meanders through the riparian and wet meadow habitats.

### 8.8.3.6 Rush Creek Below Silver Lake

There are 74.95 acres of riparian habitat along Rush Creek below Silver Lake in the study area (refer to Table 8.8-3).

The Rush Creek below Silver Lake Reach is a low-gradient stream that gently meanders through a U-shaped valley for approximately 2.7 miles to its confluence with Grant Lake. Riparian vegetation was sampled along this stream segment in September 2023 (SCE 2024a, SD A). Refer to Table 8.8-4 for summary metrics collected at this riparian sampling site during 2023 surveys (SCE 2024a, SD A).

Rush Creek below Silver Lake contains a narrow riparian forest community along the banks and is surrounded by sagebrush (*Artemisia* spp.) habitats on surrounding terraces and slopes (refer to Map 8.8-1g). Three MCV riparian alliances were recorded along this portion of the study area, including *Pinus contorta* spp. *murrayana* Forest and Woodland Alliance (Lodgepole Pine Forest), *Populus tremuloides* Forest and Woodland Alliance (Quaking Aspen Groves), *Salix exigua* Shrubland Alliance (Sandbar Willow Thickets).

Cover of woody riparian vegetation is relatively high along this stream segment, and all age classes (young, medium, and old) were observed during surveys conducted in 2023 (SCE 2024a, SD A). The most abundant woody riparian species included lodgepole pine, quaking aspen, Woods' rose (*Rosa woodsia*), narrowleaf willow, arroyo willow, and Pacific willow. Willows were typically restricted to the immediate edges of the bank, while lodgepole pine and quaking aspen were dominant in the overstory. In some areas, the riparian corridor widens along bends in Rush Creek, where the substrate is typically inundated for longer periods of the season. In these areas, willows predominate and the aspen and lodgepole pine overstory is sparser. Understory species included a mix of graminoids dominated by sedges and grasses, and herbaceous species such as horsetails (*Equisetum* spp.) and Canada goldenrod (*Solidago elongata*).

### 8.8.3.7 South Rush Creek

There are 1.54 acres of riparian habitat along Rush Creek below Silver Lake in the study area (refer to Table 8.8-3).

South Rush Creek diverges from Rush Creek near RM 17.8 and converges with it again at near RM 17.5. This portion of South Rush Creek follows a relatively high gradient from the connection of Rush Creek Horsetail Falls until South Rush Creek intersects with another un-named perennial stream and flows into a culvert under State Route 158. Before it connects to the un-named perennial stream, South Rush Creek is intermittent. After flowing under State Route 158, South Rush Creek is perennial. Near the intersection of South Rush Creek and the perennial stream, a wet meadow has formed, with a forest overstory of lodgepole pine and thick cover of wetland herbaceous vegetation. This pattern continues after South Rush Creek passes under State Route 158. Riparian vegetation was sampled along this stream segment in September 2023 (SCE 2024a, SD A). Refer to Table 8.8-4 for summary metrics collected at this riparian sampling site during 2023 surveys (SCE 2024a, SD A).

Two MCV riparian alliances were recorded along this portion of the study area, including *Pinus contorta* spp. *murrayana* Forest and Woodland Alliance (Lodgepole Pine Forest) and *Populus tremuloides* Forest and Woodland Alliance (Quaking Aspen Groves). Cover of woody riparian vegetation is moderate and all age classes were observed during studies conducted in 2023 (SCE 2024a, SD A). The most abundant woody riparian species were lodgepole pine, quaking aspen, Woods' rose, arroyo willow, Lemmon's willow, Sierra gray willow, and American dogwood. Willows and dogwood were patchily distributed along the immediate banks of the stream corridor, underneath an overstory of lodgepole pine and quaking aspen. Common understory vegetation included panicled bulrush, bluejoint (*Calamagrostis canadensis*), blue wildrye (*Elymus glaucus*), and Kentucky bluegrass (*Poa pratensis*), tarragon (*Artemisia dracunculus*), and field horsetail (*Equisetum arvense*). Refer to Map 8.8-2 for the location of riparian alliances along Rush Creek and South Rush Creek channel upstream and downstream of the State Route 158 crossing.

### 8.8.4 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 segments, 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 (SCE 2024b, SD A). Riparian corridors provide valuable habitat for riparian nesting birds and provide covered travel corridors for a multitude of wildlife species. Refer to Table 8.8-6 for a list of special-status plants, special-status wildlife species, and invasive plants that are known to occur or may potentially utilize wetland, riparian, and littoral habitats. Fish and other aquatic species that use or are influenced by wetland, riparian, and littoral habitats are described in Section 8.4, Fish and Aquatic Resources.

### 8.8.5 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.

E. Read and Associates, Inc. 2023. Analysis of Riparian Vegetation: 2022 Field Season and Comparison to Previous Years. Rush Creek (FERC No. 1389). Final Report, April 25, 2023.

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.

———. 2016. Plan and Schedule for the Seismic Retrofit of the Rush Creek Project FERC Accession No. 20161108-0178. October 27.

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

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.

Sacchi, C.F. and P.W. Price. 1992. The relative roles of abiotic and biotic factors in seedling demography of arroyo willow (*Salix lasiolepis*: Salicaceae). American Journal of Botany, 79(4), pp.395-405.

Sawyer, J.O., T. Keeler-Wolf, and J.M. Evens. 2009. A Manual of California Vegetation, Second Edition. California Native Plant Society, Sacramento, CA. 1300 pp.

SCE (Southern California Edison Company). 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.

———. 2024a. Draft TERR 1 – Botanical Resources Technical Study Report. August. Available in Supporting Document A of the Application for New License.

———. 2024b. Draft TERR 2 – Wildlife Resources Technical Study Report. August. Available in Supporting Document A of the Application for New License.

Stella, J.C., J.J. Battles, B.K. Orr, and J.R. McBride. 2006. Synchrony of seed dispersal, hydrology and local climate in a semi-arid river reach in California. Ecosystems, 9, pp.1200-1214.

# TABLES

## Table 8.8-1. Project-affected Stream Segments, Project Reservoirs, Silver Lake, and Selected Riparian Sampling Sites

| Project-affected Stream Segment/Project Reservoir Name | Stream Reach Length (River Miles [RM]) | Riparian Sampling Sites Present (SCE 2024a, SD A) Abbreviation (Approximate RM) |
|---|---|---|
| **Rush Creek** | | |
| **Waugh Lake** | 1.51 (RM 22.24–23.75) | **Yes (RM 23.0)** |
| **Rush Creek Below Rush Meadows Dam[1]** | 1.83 (RM 20.41–22.24) | **Yes[2] (RM 21.65)** |
| Gem Lake | 0.93 (RM 19.48–20.41) | — |
| Rush Creek Below Gem Dam | 0.30 (RM 19.18–19.48) | — |
| Agnew Lake | 0.58 (RM 18.60–19.18) | — |
| **Rush Creek Below Agnew Dam** | 0.40 (RM 18.2–18.60) | **Yes (RM 18.55)** |
| Rush Creek Horsetail Falls | 0.54 (RM 17.66–18.2) | — |
| **Rush Creek Above Silver Lake** | 0.94 (RM 16.72–17.66) | **Yes (RM 17.05 and RM 17.55)** |
| Silver Lake | 0.83 (RM 15.89–16.72) | — |
| **Rush Creek Below Silver Lake** | 2.69 (RM 13.20–15.89) | **Yes (RM 15.2)** |
| **South Rush Creek** | | |
| **South Rush Creek** | 0.46 (RM 0.0–0.46) | **Yes (RM 0.15)** |

1. Includes long-term baseline riparian monitoring sites that have historically been monitored consistent with Forest Service Final 4(e) Condition No. 7 – Monitoring (FERC 1997).

2. Three existing sites along this Project-affected stream segment were sampled by E Read and Associates, Inc. in 2022 (E Read and Associates, Inc. 2023).

## Table 8.8-2. Manual of California Vegetation (MCV) Riparian Alliances Along Rush Creek Project-affected Stream Segments, Project Reservoirs and Silver Lake

| Manual of California (MCV) Riparian Alliances | Associated CALVEG Alliances |
|---|---|
| Pinus contorta ssp. murrayana Forest and Woodland Alliance (Lodgepole Pine Forest and Woodland) | Lodgepole Pine Alliance (LP) |
| Populus tremuloides Forest and Woodland Alliance (Aspen Groves) | Quaking Aspen Alliance (QQ) |
| Salix boothii – Salix geyeriana – Salix lutea Shrubland Alliance (Booth's Willow – Geyer's Willow – Yellow Willow Thickets) | Shrub Willow Alliance (WL) |
| Salix exigua Shrubland Alliance (Sandbar Willow Thickets) | Shrub Willow Alliance (WL) |
| Salix lasiolepis Shrubland Alliance (Arroyo Willow Thickets) | Shrub Willow Alliance (WL) |
| Salix lemmonii Shrubland Alliance (Lemmon's Willow Thickets) | Shrub Willow Alliance (WL) |
| Salix orestera Shrubland Alliance (Sierra Gray Willow Thickets) | Shrub Willow Alliance (WL) |

*Sources:*

*Forest Service. 2009. Vegetation Descriptions: South Sierran Ecological Province – CALVEG Zone 4. April 27, 2009.*

*Sawyer, J.O., T. Keeler-Wolf, and J.M. Evens. 2009. A Manual of California Vegetation, Second Edition. California Native Plant Society, Sacramento, CA. 1300 pp.*

## Table 8.8-3. Acres of MCV Riparian Alliances by Project-affected Stream Segment, Project Reservoir, and Silver Lake

| Project-affected Reservoir or Stream Segment | Acres of MCV Riparian Alliance | | | | | | | TOTAL (acres) |
|---|---|---|---|---|---|---|---|---|
| | *Pinus contorta* ssp. *murrayana* Forest and Woodland Alliance (Lodgepole Pine Forest and Woodland) | *Populus tremuloides* Forest and Woodland Alliance (Aspen Groves) | *Salix boothii – Salix geyeriana – Salix lutea* Shrubland Alliance (Booth' s Willow – Geyer' s Willow – Yellow Willow Thickets) | *Salix exigua* Shrubland Alliance (Sandbar Willow Thickets) | *Salix lasiolepis* Shrubland Alliance (Arroyo Willow Thickets) | *Salix lemmonii* Shrubland Alliance (Lemmon' s Willow Thickets) | *Salix orestera* Shrubland Alliance (Sierra Gray Willow Thickets) | |
| **Rush Creek** | | | | | | | | |
| Waugh Lake | — | — | 0.34 | — | — | — | 0.34 | 0.68 |
| Rush Creek Below Rush Meadows Dam | — | — | — | — | — | — | 13.89 | 13.89 |
| Gem Lake | — | — | 0.88 | — | — | 0.06 | — | 0.94 |
| Rush Creek Below Gem Dam | — | — | 0.34 | — | — | — | — | 0.34 |
| Agnew Lake | — | — | 0.63 | 2.05 | — | — | — | 2.68 |
| Rush Creek Below Agnew Dam | — | 0.16 | — | — | 0.50 | — | — | 0.66 |
| Rush Creek Horsetail Falls | — | — | — | — | — | — | — | 0 |
| Rush Creek Above Silver Lake[1] | 2.38 | 8.65 | 0.82 | — | — | 22.10 | — | 33.95 |
| Silver Lake[1] | — | 16.07 | — | — | — | 10.73 | — | 26.80 |
| Rush Creek Below Silver Lake | 9.58 | 41.89 | — | 23.48 | — | — | — | 74.95 |
| **South Rush Creek** | | | | | | | | |
| South Rush Creek[1] | 1.54 | — | — | — | — | — | — | 1.54 |

[1] Please note that in some cases, there is substantial overlap in riparian communities that occur within the floodplain, and values are reported twice for riparian communities that border both Rush Creek Above Silver Lake and Silver Lake, and Rush Creek Above Silver Lake and South Rush Creek.

**Table 8.8-4. Summary of Riparian Data Collected at Selected Riparian Sampling Sites**

| Riparian Sampling Site | Woody Riparian Trees/Shrubs | | | Herbaceous/Graminoid Plants | | Substrates Present |
|---|---|---|---|---|---|---|
| | Average Percent Cover | Average Species Richness | Age Classes Present[2] | Average Percent Cover | Average Species Richness | |
| Waugh Lake[1] | 1.4 | 0.6 | Y | 23.6 | 4.8 | Bedrock, Boulder, Cobble, Gravel, Sand, Silt |
| Rush Creek Below Rush Meadows Dam[2] | 24.9 (Riparian Shrub), 47.8 (Upland Conifers), 7.5 (Upland Shrubs) | 3 (Riparian Shrub), 2 (Upland Conifer) | M,O (No recruitment of young seedlings observed). | 11.5 (Riparian), 5.5 (Upland) | 11.5 (Riparian), 13.5 (Upland) | Gravel, Sand, Silt |
| Rush Creek Below Agnew Dam | 79.1 | 3.6 | Y, M, O | 37.1 | 5.1 | Bedrock, Boulder, Cobble, Gravel, Sand, Silt |
| Rush Creek Above Silver Lake (RM 17.05) | 104.3 | 3 | Y, M, O | 73.7 | 2.3 | Boulder, Cobble, Gravel, Sand, Silt |
| Rush Creek Above Silver Lake (RM 17.55) | 50.6 | 1.6 | Y, M, O | 75 | 4 | Gravel, Sand, Silt |
| Rush Creek Below Silver Lake | 96.7 | 2.5 | Y, M, O | 79.9 | 4.1 | Boulder, Cobble, Gravel, Sand, Silt |
| South Rush Creek | 73.4 | 4.1 | Y, M, O | 56 | 4.9 | Boulder, Cobble, Gravel, Sand, Silt |

[1] Riparian sampling sites within Waugh Lake were placed along the historic streambed that is establishing within Waugh Lake. For more information on botanical resources throughout the historic inundation zone, refer to Table 8.8-5 and Figure 8.8-2, below.

[2] Age class structure was determined based on categories or shrub stem densities per individual and tree diameters, as follows:

- Young (Y): Shrubs with less than 10 stems per individual or trees with diameters (dbh) less than 3 inches;
- Medium-aged (M): Shrubs with between 10 and 60 stems per individual or trees with dbhs between 3 and 9 inches; and
- Old/Mature (O): Shrubs with more than 60 stems per individual or trees with dbhs greater than 9 inches.

[2] Data at these sampling segments was collected using methods that were established by SCE as part of the Forest Service Final 4(e) Condition No. 7 – Monitoring under the existing license (FERC 1997), which requires long-term monitoring of riparian vegetation in the reach of Rush Creek between Rush Meadows Dam and Gem Lake. Methods at the long-term riparian monitoring site differ slightly from the methods described in the TERR 2 – TSP, and data is averaged by site rather than reported for each transect.

## Table 8.8-5. Total Species Richness of Graminoids, Herbs, Shrubs, and Trees Within the Historic Inundation Zones (Littoral Habitats) of Project Reservoirs

| Project Reservoir | Species Richness (Total Number of Species) | | | | Total Number of All Species |
|---|---|---|---|---|---|
| | Graminoids | Herbs | Shrubs | Trees | |
| Waugh Lake | 41 | 42 | 10 | 4 | **97** |
| Gem Lake | 25 | 36 | 16 | 4 | **81** |
| Agnew Lake | 27 | 35 | 18 | 4 | **84** |

[1] For the purposes of this document, we have defined littoral habitats as the historic inundation zone of the Project reservoirs, even though since the seismic restrictions were implemented, these areas have gradually been transitioning to either riparian or upland habitats.

**Table 8.8-6. Riparian and Wetland Special-Status Plants, Invasive Plants, and Special-Status Wildlife Known to Occur or Potentially Occurring Along the Project-Affected Stream Segments, Project Reservoirs, and Silver Lake**

| Scientific Name<br>Common Name | Status | Potential for Occurrence | | Riparian and Wetland Habitat Types Potentially Utilized by Riparian and Wetland Species | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | MCV Riparian Habitats | | | | | | | Cowardin Wetland Types | | | |
| | | Known to Occur | May Potentially Occur | *Pinus contorta* ssp. *murrayana* Forest and Woodland Alliance (Lodgepole Pine Forest and Woodland) | *Populus tremuloides* Forest and Woodland Alliance (Aspen Groves) | *Salix boothii – Salix geyeriana – Salix lutea* Shrubland Alliance (Booth' s Willow – Geyer' s Willow – Yellow Willow Thickets) | *Salix exigua* Shrubland Alliance (Sandbar Willow Thickets) | *Salix lasiolepis* Shrubland Alliance (Arroyo Willow Thickets) | *Salix lemmonii* Shrubland Alliance (Lemmon' s Willow Thickets) | *Salix orestera* Shrubland Alliance (Sierra Gray Wilow Thickets) | Palustrine Forested Wetlands | Palustrine Scrub Shrub Wetlands | Palustrine Emergent Wetlands | Littoral Habitats (Lakes, Reservoirs) |
| **Special-Status Plants** | | | | | | | | | | | | | | |
| *Agrostis humilis*<br>mountain bentgrass | FSCC, 2B.3 | X | | X | | | | | | | | | X | |
| *Astragalus lemmonii*<br>Lemmon's milk-vetch | FSCC, 1B.2 | | X | | | | | | | | | | X | X |
| *Botrychium ascendens*<br>upswept moonwort | FSCC, 2B.3 | | X | X | | | | | | | X | | X | |
| *Botrychium crenulatum*<br>scalloped moonwort | FSCC, 2B.2 | | X | X | X | X | X | X | X | X | X | X | X | |
| *Botrychium lineare*<br>slender moonwort | FSCC, 1B.1 | | X | X | X | X | X | X | X | X | X | X | X | |
| *Botrychium neolunaria*<br>common moonwort | 2B.3 | | X | X | X | X | X | X | X | X | X | X | X | X |
| *Botrychium paradoxum*<br>paradox moonwort | 2B.1 | | X | X | | | | | | | X | | | |
| *Bruchia bolanderi*<br>Bolander's bruchia | FSCC, 4.2 | | X | X | X | X | X | X | X | X | X | X | X | |
| *Carex idahoa*<br>Idaho sedge | FSCC, 2B.3 | | X | X | X | X | X | X | X | X | X | X | X | |
| *Carex petasata*<br>Liddon's sedge | FSCC, 2B.3 | | X | X | X | X | X | X | X | X | X | X | X | |
| *Carex praticola*<br>northern meadow sedge | FSCC, 2B.2 | | X | | | X | X | X | X | X | | X | X | |
| *Carex scirpoidea* ssp. *pseudoscirpoidea*<br>western single-spiked sedge | FSCC, 2B.2 | | X | X | X | X | X | X | X | X | X | X | X | |
| *Carex stevenii*<br>Steven's sedge | FSCC, 2B.2 | | X | X | X | X | X | X | X | X | X | X | X | |
| *Carex vallicola*<br>western valley sedge | FSCC, 2B.3 | | X | | | X | X | X | X | X | | X | X | |

| Scientific Name<br>Common Name | Status | Potential for Occurrence | | Riparian and Wetland Habitat Types Potentially Utilized by Riparian and Wetland Species | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | MCV Riparian Habitats | | | | | | | Cowardin Wetland Types | | | |
| | | Known to Occur | May Potentially Occur | *Pinus contorta* ssp. *murrayana* Forest and Woodland Alliance (Lodgepole Pine Forest and Woodland) | *Populus tremuloides* Forest and Woodland Alliance (Aspen Groves) | *Salix boothii – Salix geyeriana – Salix lutea* Shrubland Alliance (Booth’ s Willow – Geyer’ s Willow – Yellow Willow Thickets) | *Salix exigua* Shrubland Alliance (Sandbar Willow Thickets) | *Salix lasiolepis* Shrubland Alliance (Arroyo Willow Thickets) | *Salix lemmonnii* Shrubland Alliance (Lemmon’ s Willow Thickets) | *Salix orestera* Shrubland Alliance (Sierra Gray Wilow Thickets) | Palustrine Forested Wetlands | Palustrine Scrub Shrub Wetlands | Palustrine Emergent Wetlands | Littoral Habitats (Lakes, Reservoirs) |
| *Cinna bolanderi*<br>Bolander's woodreed | 1B.2 | | X | X | X | X | X | X | X | X | X | X | X | |
| *Dermatocarpon meiophyllizum*<br>silverskin lichen | 2B.3 | | X | X | X | X | X | X | X | X | X | X | X | X |
| *Draba praealta*<br>tall draba | 2B.3 | | X | | | X | X | X | X | X | | X | X | |
| *Elodium* (=*Helodium*) *blandowii*<br>Blandow's bog moss | FSCC, 2B.3 | | X | X | X | X | X | X | X | X | X | X | X | |
| *Festuca minutiflora*<br>small-flowered fescue | 2B.3 | | X | X | | | | | | | X | | | |
| *Kobresia myosuroides (= bellardii)*<br>seep kobresia | FSCC, 2B.2 | | X | X | X | X | X | X | X | X | X | X | X | |
| *Lupinus lepidus* var. *culbertsonii*<br>Hockett Meadows lupine | 1B.3 | | X | X | X | X | X | X | X | X | X | X | X | |
| *Lupinus padre-crowleyi*<br>Father Crowley’s lupine | SR, FSCC, 1B.2 | | X | X | X | X | X | X | X | X | X | X | | |
| *Meesia longiseta*<br>long seta hump moss | 2B.3 | | X | X | X | X | X | X | X | X | X | X | X | |
| *Meesia uliginosa*<br>broad-nerved hump moss | 2B.2 | | X | X | X | X | X | X | X | X | X | X | X | |
| *Parnassia parviflora*<br>small-flowered grass-of-Parnassus | 2B.2 | | X | | | X | X | X | X | X | X | X | X | |
| *Pedicularis crenulata*<br>scalloped-leaved lousewort | 2B.2 | | X | X | X | X | X | X | X | X | X | X | X | |
| *Pohlia tundrae*<br>tundra thread moss | 2B.3 | | X | X | X | X | X | X | X | X | X | X | X | |
| *Polyctenium williamsiae*<br>Williams' combleaf | FSCC, 1B.2 | | X | | | | | | | | | | X | |
| *Potamogeton praelongus*<br>white-stemmed pondweed | 2B.3 | | X | | | | | | | | | | | X |
| *Potamogeton robbinsii*<br>Robbins’ pondweed | 2B.3 | | X | | | | | | | | | | | X |

| Scientific Name<br>Common Name | Status | Potential for Occurrence | | Riparian and Wetland Habitat Types Potentially Utilized by Riparian and Wetland Species | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | MCV Riparian Habitats | | | | | | | Cowardin Wetland Types | | | |
| | | Known to Occur | May Potentially Occur | *Pinus contorta* ssp. *murrayana* Forest and Woodland Alliance (Lodgepole Pine Forest and Woodland) | *Populus tremuloides* Forest and Woodland Alliance (Aspen Groves) | *Salix boothii – Salix geyeriana – Salix lutea* Shrubland Alliance (Booth’s Willow – Geyer’s Willow – Yellow Willow Thickets) | *Salix exigua* Shrubland Alliance (Sandbar Willow Thickets) | *Salix lasiolepis* Shrubland Alliance (Arroyo Willow Thickets) | *Salix lemmonii* Shrubland Alliance (Lemmon’s Willow Thickets) | *Salix orestera* Shrubland Alliance (Sierra Gray Wilow Thickets) | Palustrine Forested Wetlands | Palustrine Scrub Shrub Wetlands | Palustrine Emergent Wetlands | Littoral Habitats (Lakes, Reservoirs) |
| *Ranunculus hydrocharoides*<br>frog’s-bit buttercup | FSCC, 2B.1 | | X | | | X | X | X | X | X | | X | X | X |
| *Sabulina stricta*<br>bog sandwort | 2B.3 | | X | | | X | X | X | X | X | | X | X | X |
| *Salix brachycarpa* var. *brachycarpa*<br>short-fruited willow | 2B.3 | | X | X | X | X | X | X | X | X | X | X | X | |
| *Sphaeromeria potentilloides* var. *nitrophila*<br>fivefinger chickensage (alkali tansy-sage) | FSCC, 2B.2 | | X | | | | | | | | | | X | |
| *Thelypodium integrifolium* ssp. *complanatum*<br>foxtail thelypodium | FSCC, 2B.2 | | X | X | | | | | | | | | X | |
| *Trichophorum pumilum*<br>little bulrush | FSCC, 2B.2 | | X | X | X | X | X | X | X | X | X | X | X | |
| *Trifolium bolanderi*<br>Bolander's clover | 1B.2 | | X | X | X | X | X | X | X | X | X | X | X | |
| *Triglochin palustris*<br>marsh arrow-grass | 2B.3 | | X | X | X | X | X | X | X | X | X | X | X | |
| *Viola pinetorum* ssp. *grisea*<br>gray-leaved violet | 1B.2 | | X | X | X | X | X | X | X | X | X | X | X | |

| Scientific Name<br>Common Name | Status | Potential for Occurrence: Known to Occur | Potential for Occurrence: May Potentially Occur | Riparian and Wetland Habitat Types Potentially Utilized by Riparian and Wetland Species — MCV Riparian Habitats: *Pinus contorta* ssp. *murrayana* Forest and Woodland Alliance (Lodgepole Pine Forest and Woodland) | *Populus tremuloides* Forest and Woodland Alliance (Aspen Groves) | *Salix boothii – Salix geyeriana – Salix lutea* Shrubland Alliance (Booth's Willow – Geyer's Willow – Yellow Willow Thickets) | *Salix exigua* Shrubland Alliance (Sandbar Willow Thickets) | *Salix lasiolepis* Shrubland Alliance (Arroyo Willow Thickets) | *Salix lemmonii* Shrubland Alliance (Lemmon's Willow Thickets) | *Salix orestera* Shrubland Alliance (Sierra Gray Wilow Thickets) | Cowardin Wetland Types: Palustrine Forested Wetlands | Palustrine Scrub Shrub Wetlands | Palustrine Emergent Wetlands | Littoral Habitats (Lakes, Reservoirs) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Invasive Plants** | | | | | | | | | | | | | | |
| *Centaurea stoebe* ssp. *micranthos* *(= maculosa)*<br>spotted knapweed | Inyo National Forest Treatment Strategy 1 | X | | X | X | X | X | X | X | X | X | X | X | |
| *Cirsium vulgare*<br>bull thistle | Inyo National Forest Treatment Strategy 3 | X | | X | X | X | X | X | X | X | X | X | X | |
| *Melilotus spp.*<br>sweetclover | Inyo National Forest Treatment Strategy 3 | X | | | | | | | | | X | X | X | |
| *Polygonum aviculare*<br>prostrate knotweed | Inyo National Forest Treatment Strategy 4 | X | | X | X | X | X | X | X | X | X | X | X | |
| *Rumex crispus*<br>curly dock | Inyo National Forest Treatment Strategy 4 | X | | X | X | X | X | X | X | X | X | X | X | |
| *Saponaria officinalis*<br>bouncingbet | Inyo National Forest Treatment Strategy 2 | X | | X | X | X | X | X | X | X | X | X | | |
| *Spergularia rubra*<br>red sandspurry | Inyo National Forest Treatment Strategy 4 | X | | X | X | X | X | X | X | X | X | X | X | |
| *Taraxacum officinale*<br>dandelion | Inyo National Forest Treatment Strategy 4 | X | | X | X | X | X | X | X | X | X | X | X | |
| *Trifolium repens*<br>white clover | Inyo National Forest Treatment Strategy 4 | X | | X | X | X | X | X | X | X | X | X | X | |
| *Verbascum thapsus*<br>Common (woolly) mullein | Inyo National Forest Treatment Strategy 4 | X | | X | X | X | X | X | X | X | X | X | X | X |
| *Acroptilon repens*<br>Russian knapweed | Inyo National Forest Treatment Strategy 1 | | X | X | X | X | X | X | X | X | X | X | | |
| *Ailanthus altissima*<br>tree-of-heaven | Inyo National Forest Treatment Strategy 1 | | X | X | X | X | X | X | X | X | X | X | X | |
| *Bassia hyssopifolia*<br>fivehorn smotherweed | Inyo National Forest Treatment Strategy 3 | | X | | | X | X | X | X | X | | X | | |
| *Bromus diandrus*<br>ripgut brome | Inyo National Forest Treatment Strategy 4 | | X | X | X | X | X | X | X | X | X | X | X | |
| *Bromus madritensis* ssp. *rubens*<br>red brome | Inyo National Forest Treatment Strategy 3 | | X | X | X | X | X | X | X | X | X | X | | |

| Scientific Name<br>Common Name | Status | Potential for Occurrence | | Riparian and Wetland Habitat Types Potentially Utilized by Riparian and Wetland Species | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | MCV Riparian Habitats | | | | | | | Cowardin Wetland Types | | | |
| | | Known to Occur | May Potentially Occur | *Pinus contorta* ssp. *murrayana* Forest and Woodland Alliance (Lodgepole Pine Forest and Woodland) | *Populus tremuloides* Forest and Woodland Alliance (Aspen Groves) | *Salix boothii* – *Salix geyeriana* – *Salix lutea* Shrubland Alliance (Booth's Willow – Geyer's Willow – Yellow Willow Thickets) | *Salix exigua* Shrubland Alliance (Sandbar Willow Thickets) | *Salix lasiolepis* Shrubland Alliance (Arroyo Willow Thickets) | *Salix lemmonii* Shrubland Alliance (Lemmon's Willow Thickets) | *Salix orestera* Shrubland Alliance (Sierra Gray Wilow Thickets) | Palustrine Forested Wetlands | Palustrine Scrub Shrub Wetlands | Palustrine Emergent Wetlands | Littoral Habitats (Lakes, Reservoirs) |
| *Centaurea diffusa*<br>diffuse knapweed | Inyo National Forest Treatment Strategy 1 | | X | X | X | X | X | X | X | X | X | X | | |
| *Centaurea solstitialis*<br>yellow star-thistle | Inyo National Forest Treatment Strategy 1 | | X | | | X | X | X | X | X | | X | | |
| *Cirsium arvense*<br>Canada thistle | Inyo National Forest Treatment Strategy 1 | | X | X | X | X | X | X | X | X | X | X | X | |
| *Convolvulus arvensis*<br>field bindweed | Inyo National Forest Treatment Strategy 3 | | X | X | X | X | X | X | X | X | X | X | | |
| *Descurainia sophia*<br>herb sophia | Inyo National Forest Treatment Strategy 4 | | X | X | X | X | X | X | X | X | X | X | X | |
| *Dipsacus fullonum*<br>Fuller's teasel | Inyo National Forest Treatment Strategy 2 | | X | | | X | X | X | X | X | | X | X | |
| *Elaeagnus angustifolia*<br>Russian olive | Inyo National Forest Treatment Strategy 2 | | X | | | X | X | X | X | X | | X | X | |
| *Grindelia squarrosa* var. *serrulata*<br>curlycup gumweed | Inyo National Forest Treatment Strategy 4 | | X | X | X | X | X | X | X | X | X | X | X | |
| *Halogeton glomeratus*<br>saltlover | Inyo National Forest Treatment Strategy 2 | | X | X | X | X | X | X | X | X | X | X | X | |
| *Hirschfeldia incana*<br>shortpod mustard | Inyo National Forest Treatment Strategy 3 | | X | X | X | X | X | X | X | X | X | X | | |
| *Holcus lanatus*<br>common velvetgrass | Inyo National Forest Treatment Strategy 3 | | X | | | | | | | | | X | | |
| *Hordeum murinum*<br>foxtail barley | Inyo National Forest Treatment Strategy 4 | | X | | | | | | | | | | X | |
| *Lactuca serriola*<br>prickly lettuce | Inyo National Forest Treatment Strategy 4 | | X | X | X | X | X | X | X | X | X | X | X | |
| *Lepidium appelianum*<br>hairy whitetop | Inyo National Forest Treatment Strategy 1 | | X | | | X | X | X | X | X | | X | X | |
| *Lepidium chalepensis*<br>lens-podded hoary cress | Inyo National Forest Treatment Strategy 1 | | X | | X | X | X | X | X | X | | X | X | |
| *Lepidium draba*<br>heart-podded hoary cress | Inyo National Forest Treatment Strategy 1 | | X | X | X | X | X | X | X | X | X | X | X | |

| Scientific Name<br>Common Name | Status | Potential for Occurrence | | Riparian and Wetland Habitat Types Potentially Utilized by Riparian and Wetland Species | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | MCV Riparian Habitats | | | | | | | Cowardin Wetland Types | | | |
| | | Known to Occur | May Potentially Occur | *Pinus contorta* ssp. *murrayana* Forest and Woodland Alliance (Lodgepole Pine Forest and Woodland) | *Populus tremuloides* Forest and Woodland Alliance (Aspen Groves) | *Salix boothii – Salix geyeriana – Salix lutea* Shrubland Alliance (Booth' s Willow – Geyer' s Willow – Yellow Willow Thickets) | *Salix exigua* Shrubland Alliance (Sandbar Willow Thickets) | *Salix lasiolepis* Shrubland Alliance (Arroyo Willow Thickets) | *Salix lemmonnii* Shrubland Alliance (Lemmon' s Willow Thickets) | *Salix orestera* Shrubland Alliance (Sierra Gray Wilow Thickets) | Palustrine Forested Wetlands | Palustrine Scrub Shrub Wetlands | Palustrine Emergent Wetlands | Littoral Habitats (Lakes, Reservoirs) |
| *Lepidium latifolium*<br>perennial pepperweed | Inyo National Forest Treatment Strategy 1 | | X | X | X | X | X | X | X | X | X | X | X | |
| *Linaria vulgaris*<br>butter and eggs | Inyo National Forest Treatment Strategy 1 | | X | | X | X | X | X | X | X | X | X | | |
| *Lotus corniculatus*<br>birdfoot trefoil | Inyo National Forest Treatment Strategy 3 | | X | X | X | X | X | X | X | X | X | X | X | |
| *Marrubium vulgare*<br>horehound | Inyo National Forest Treatment Strategy 3 | | X | X | X | X | X | X | X | X | X | X | X | |
| *Poa bulbosa*<br>bulbous bluegrass | Inyo National Forest Treatment Strategy 4 | | X | X | X | X | X | X | X | X | | | | |
| *Polygonum arenastrum*<br>oval-leaf knotweed | Inyo National Forest Treatment Strategy 4 | | X | X | X | X | X | X | X | X | X | X | X | |
| *Polypogon monspeliensis*<br>annual rabbitsfoot grass | Inyo National Forest Treatment Strategy 4 | | X | X | X | X | X | X | X | X | X | X | X | |
| *Robinia pseudoacacia*<br>black locust | Inyo National Forest Treatment Strategy 3 | | X | X | X | X | X | X | X | X | | | | |
| *Rubus armeniacus*<br>Himalayan blackberry | Inyo National Forest Treatment Strategy 2 | | X | X | X | X | X | X | X | X | X | X | X | |
| *Schismus arabicus*<br>Arabian schismus | Inyo National Forest Treatment Strategy 4 | | X | | | | | | | | | | X | |
| *Sisymbrium altissimum*<br>tall tumblemustard | Inyo National Forest Treatment Strategy 4 | | X | | | | | | | | X | X | X | |
| *Spartium junceum*<br>Spanish broom | Inyo National Forest Treatment Strategy 1 | | X | X | X | X | X | X | X | X | X | X | | |
| *Tamarix ramosissima*<br>saltcedar | Inyo National Forest Treatment Strategy 2 | | X | X | X | X | X | X | X | X | X | X | X | |
| *Tribulus terrestris*<br>puncturevine | Inyo National Forest Treatment Strategy 2 | | X | | | X | X | X | X | X | | X | | |
| *Ulmus pumila*<br>Siberian elm | Inyo National Forest Treatment Strategy 2 | | X | X | X | X | X | X | X | X | X | X | X | |
| *Vulpia myuros*<br>annual fescue | Inyo National Forest Treatment Strategy 4 | | X | X | X | X | X | X | X | X | X | X | X | |

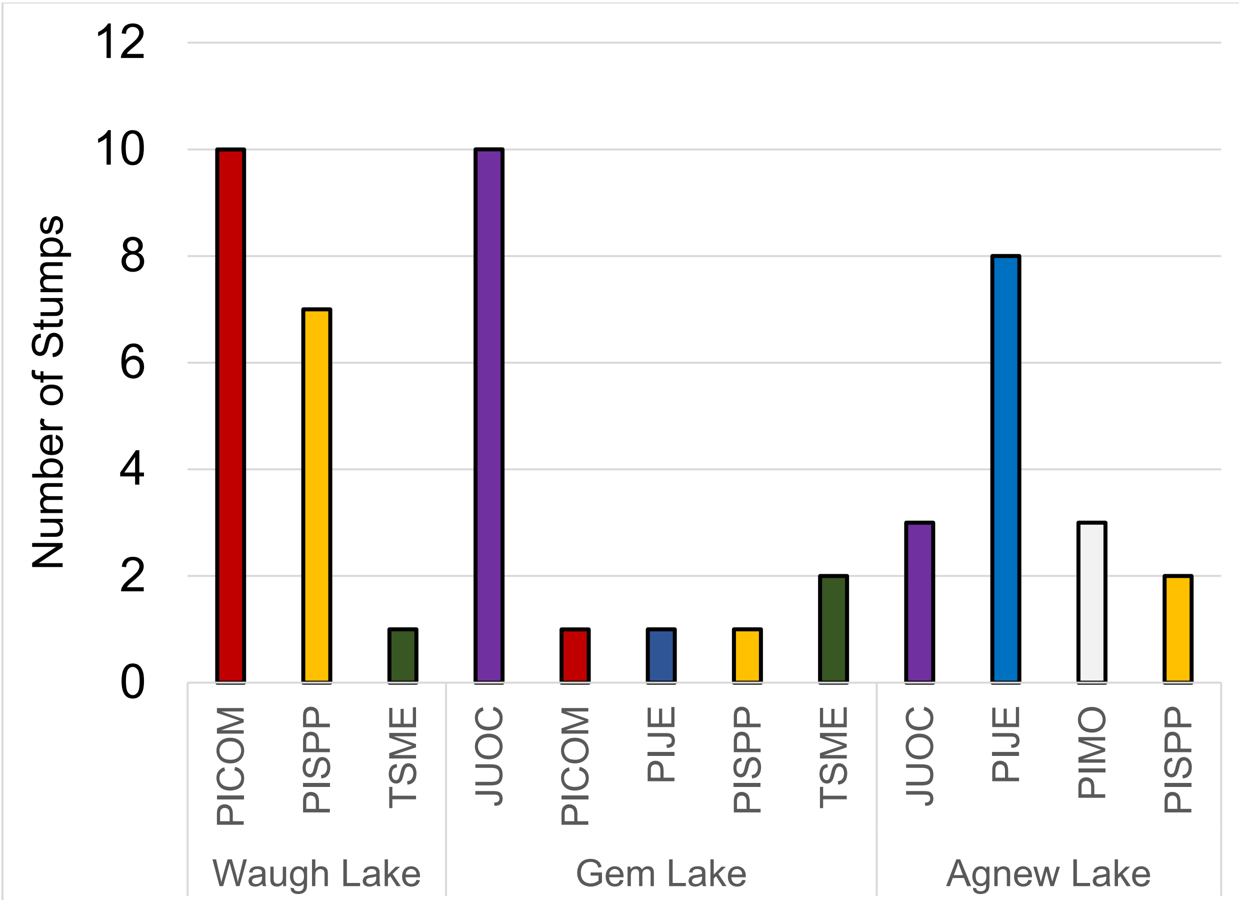
| Scientific Name<br>Common Name | Status | Potential for Occurrence | | Riparian and Wetland Habitat Types Potentially Utilized by Riparian and Wetland Species | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | MCV Riparian Habitats | | | | | | | Cowardin Wetland Types | | | |
| | | Known to Occur | May Potentially Occur | *Pinus contorta* ssp. *murrayana* Forest and Woodland Alliance (Lodgepole Pine Forest and Woodland) | *Populus tremuloides* Forest and Woodland Alliance (Aspen Groves) | *Salix boothii – Salix geyeriana – Salix lutea* Shrubland Alliance (Booth's Willow – Geyer's Willow – Yellow Willow Thickets) | *Salix exigua* Shrubland Alliance (Sandbar Willow Thickets) | *Salix lasiolepis* Shrubland Alliance (Arroyo Willow Thickets) | *Salix lemmonii* Shrubland Alliance (Lemmon's Willow Thickets) | *Salix orestera* Shrubland Alliance (Sierra Gray Wilow Thickets) | Palustrine Forested Wetlands | Palustrine Scrub Shrub Wetlands | Palustrine Emergent Wetlands | Littoral Habitats (Lakes, Reservoirs) |
| **Special-Status Wildlife** | | | | | | | | | | | | | | |
| *Danaus plexippus*<br>monarch butterfly | FC | X | | X | X | X | X | X | X | X | X | X | X | |
| *Stellula calliope*<br>calliope hummingbird | BCC | X | | X | X | X | X | | | | X | X | X | |
| *Haliaeetus leucocephalus*<br>bald eagle | Eagle Act, BCC, FSCC, SE, CFP | X | | X | X | X | X | X | X | X | X | X | X | X |
| *Setophaga petechia*<br>yellow warbler | SSC<br>(nesting) | X | | X | X | X | X | X | X | X | X | X | X | |
| *Haemorhous cassinii*<br>Cassin's finch | BCC | X | | X | X | X | X | X | X | X | X | X | X | X |
| *Speyeria nokomis apacheana*<br>apache fritillary butterfly | FSCC | | X | X | X | X | X | X | X | X | X | X | X | |
| *Rana sierrae*<br>Sierra Nevada yellow-legged frog | FE, ST | | X | X | X | X | X | X | X | X | X | X | X | X |
| *Anaxyrus canorus*<br>Yosemite toad | FT, SSC | | X | X | X | X | X | X | X | X | X | X | X | X |
| *Falco peregrinus anatum*<br>American peregrine falcon | BCC, CFP | | X | X | X | X | X | X | X | X | X | X | X | X |
| *Asio flammeus*<br>short-eared owl | SSC<br>(nesting) | | X | | | | | | | | | | X | |
| *Asio otus*<br>long-eared owl | SSC<br>(nesting) | | X | X | X | X | X | X | X | X | X | X | | |
| *Cypseloides niger*<br>black swift | BCC, SSC<br>(nesting) | | X | X | X | X | X | X | X | X | X | X | X | X |
| *Empidonax traillii brewsteri*<br>little willow flycatcher | BCC, FSCC, SE | | X | X | X | X | X | X | X | X | X | X | X | |
| *Sorex lyelli*<br>Mt. Lyell shrew | SSC | | X | X | X | X | X | X | X | X | X | X | | |
| *Euderma maculatum*<br>Spotted bat | SSC | | X | | | | | | | | | | X | X |

| Scientific Name<br>Common Name | Status | Potential for Occurrence | | Riparian and Wetland Habitat Types Potentially Utilized by Riparian and Wetland Species | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | MCV Riparian Habitats | | | | | | | Cowardin Wetland Types | | | |
| | | Known to Occur | May Potentially Occur | *Pinus contorta* ssp. *murrayana* Forest and Woodland Alliance (Lodgepole Pine Forest and Woodland) | *Populus tremuloides* Forest and Woodland Alliance (Aspen Groves) | *Salix boothii – Salix geyeriana – Salix lutea* Shrubland Alliance (Booth's Willow – Geyer's Willow – Yellow Willow Thickets) | *Salix exigua* Shrubland Alliance (Sandbar Willow Thickets) | *Salix lasiolepis* Shrubland Alliance (Arroyo Willow Thickets) | *Salix lemmonii* Shrubland Alliance (Lemmon's Willow Thickets) | *Salix orestera* Shrubland Alliance (Sierra Gray Wilow Thickets) | Palustrine Forested Wetlands | Palustrine Scrub Shrub Wetlands | Palustrine Emergent Wetlands | Littoral Habitats (Lakes, Reservoirs) |
| *Lepus americanus tahoensis*<br>Sierra Nevada snowshoe hare | SSC | | X | X | X | X | X | X | X | X | X | X | X | |
| *Aplodontia rufa californica*<br>Sierra Nevada mountain beaver | SSC | | X | X | X | X | X | X | X | X | X | X | | X |
| *Bassariscus astutus*<br>ringtail | CFP | | X | X | X | X | X | X | X | X | X | X | | |
| *Ovis canadensis sierrae*<br>Sierra Nevada bighorn sheep | FE, SE, CFP | | X | X | X | X | 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
SSC = 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)

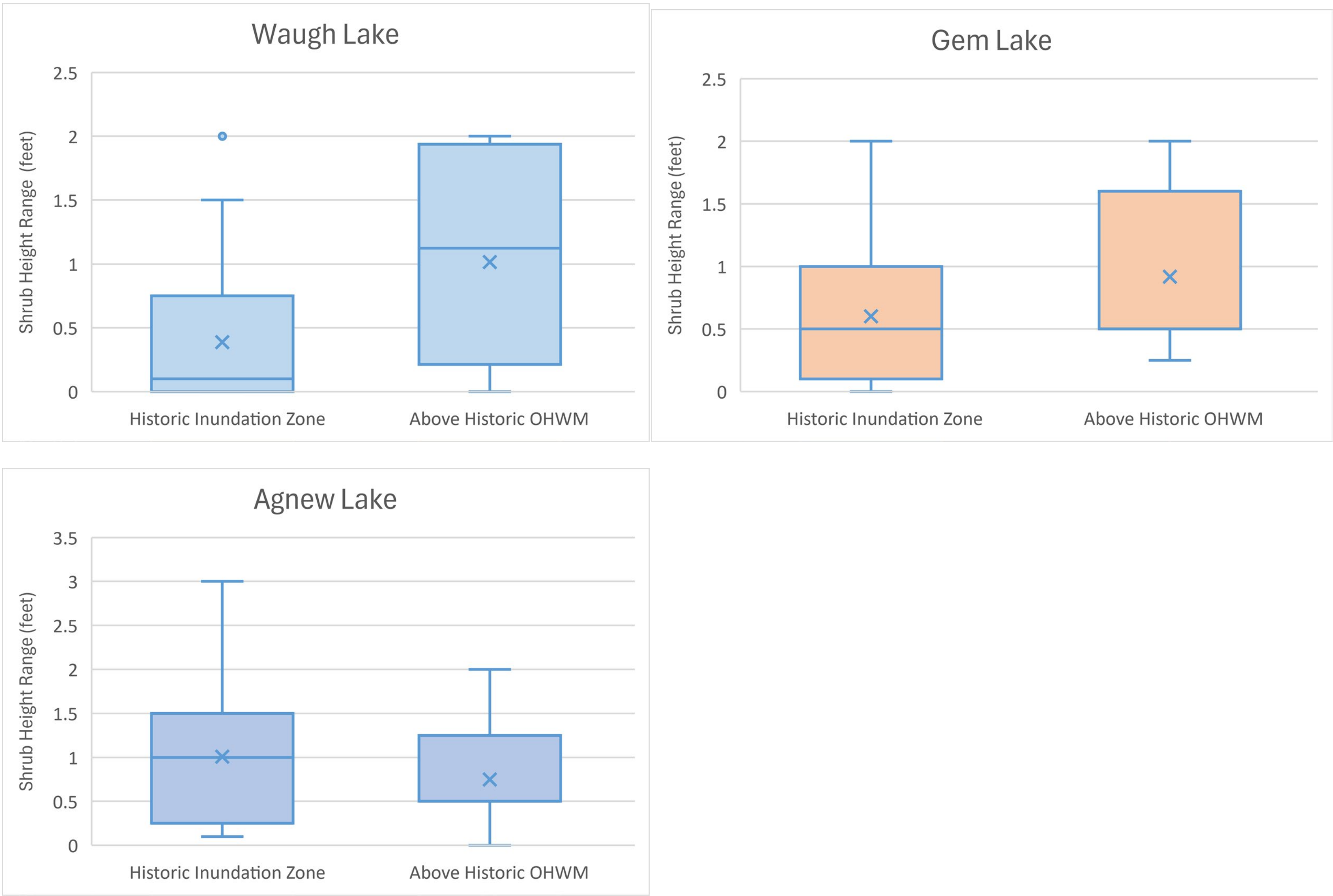
# FIGURES




JUOC = Western Juniper (*Juniperus occidentalis*), PIJE = Jeffrey Pine (*Pinus occidentalis*), PIMO = Western White Pine (*Pinus monticola*), PISPP = Unknown Pine Species (*Pinus* spp.), PICOM = Lodgepole Pine (*Pinus contorta* ssp. *murrayana*), TSME = Mountain Hemlock (*Tsuga mertensiana*).

**Figure 8.8-1. Tree Species Identified from Stump Samples Within the Historic Inundation Zones (Littoral Habitats) of Project Reservoirs.**


**Figure 8.8-2. Average Percent Cover of Graminoids, Herbs, Shrubs, and Trees in Plots Across Historic Reservoir Inundation Zones**




Outermost bars show the range of shrub heights, while the X shows the average shrub height. The majority (75%) of the observations are contained within the central box.

**Figure 8.8-3. Shrub Height Compared Between Plots in the Historic Inundation Zone and Above Historic Ordinary High Water Mark**

# MAPS


**SCE Facilities**

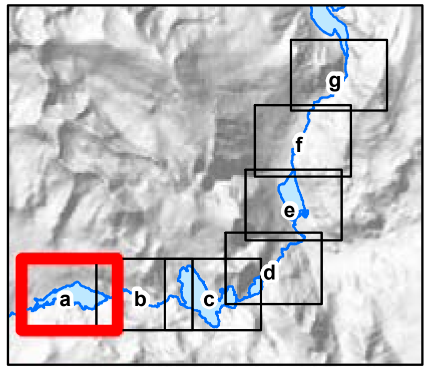
- Powerhouse
- Dam
- Stream Gage
- Reservoir Gage
- Ancillary Facility
- Helicopter Landing Site
- Water Conveyance Feature
- Tailrace
- Flowline / Penstock
- Power or Communication Line
- Tramway
- Project Road
- Project Trail
- FERC Project Boundary

**Other Features**

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

**Riparian Alliances**

- Pinus contorta ssp. murrayana Forest Alliance
- Populus tremuloides Forest Alliance
- Salix boothii – Salix geyeriana – Salix lutea Shrubland Alliance
- Salix exigua Shrubland Alliance
- Salix lasiolepis Shrubland Alliance
- Salix lemmonii Shrubland Alliance
- Salix orestera Shrubland Alliance




SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead℠

Rush Creek Project (FERC 1389)

**Map 8.8-1a**

**Riparian Vegetation Alliances on Project-Affected Stream Segments, Project Reservoirs, and Silver Lake**

Date: 5/8/2024

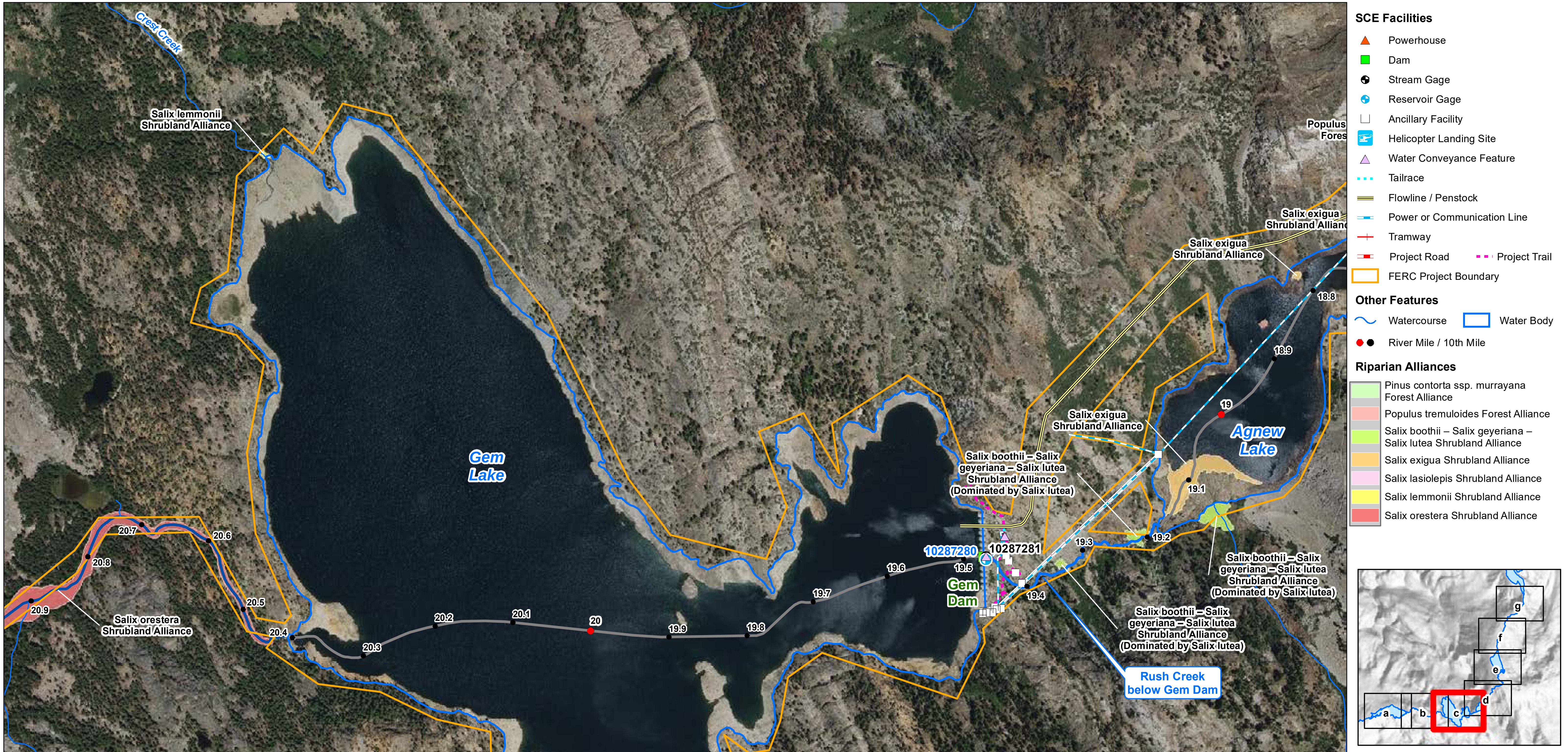
0 250 500 Feet

**Projection: UTM Zone 11**
**Datum: NAD 83**



C:\GIS\237800343\map\Rush Creek\TerrestrialMaps\SCE_RUSH_CREEK_Riparian_Alliances_17i11i_02.mxd


C:\GIS\237800343\map\Rush Creek\TerrestrialMaps\SCE_RUSH_CREEK_Riparian_Alliances_17i11i_02.mxd




SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead℠

Rush Creek Project (FERC 1389)

**Map 8.8-1c**

**Riparian Vegetation Alliances on Project-Affected Stream Segments, Project Reservoirs, and Silver Lake**

Date: 5/8/2024

Projection: UTM Zone 11
Datum: NAD 83



C:\GIS\237800343\map\Rush Creek\TerrestrialMaps\SCE_RUSH_CREEK_Riparian_Alliances_17i11i_02.mxd




C:\GIS\237800343\map\Rush Creek\TerrestrialMaps\SCE_RUSH_CREEK_Riparian_Alliances_17i11i_03.mxd


**SCE Facilities**

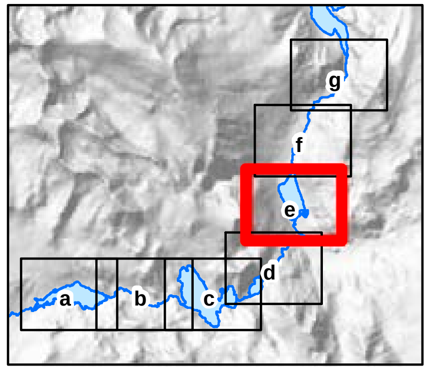
- Powerhouse
- Dam
- Stream Gage
- Reservoir Gage
- Ancillary Facility
- Helicopter Landing Site
- Water Conveyance Feature
- Tailrace
- Flowline / Penstock
- Power or Communication Line
- Tramway
- Project Road
- Project Trail
- FERC Project Boundary

**Other Features**

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

**Riparian Alliances**

- Pinus contorta ssp. murrayana Forest Alliance
- Populus tremuloides Forest Alliance
- Salix boothii – Salix geyeriana – Salix lutea Shrubland Alliance
- Salix exigua Shrubland Alliance
- Salix lasiolepis Shrubland Alliance
- Salix lemmonii Shrubland Alliance
- Salix orestera Shrubland Alliance




Rush Creek Project (FERC 1389)

**Map 8.8-1e**

**Riparian Vegetation Alliances on Project-Affected Stream Segments, Project Reservoirs, and Silver Lake**

N W E S

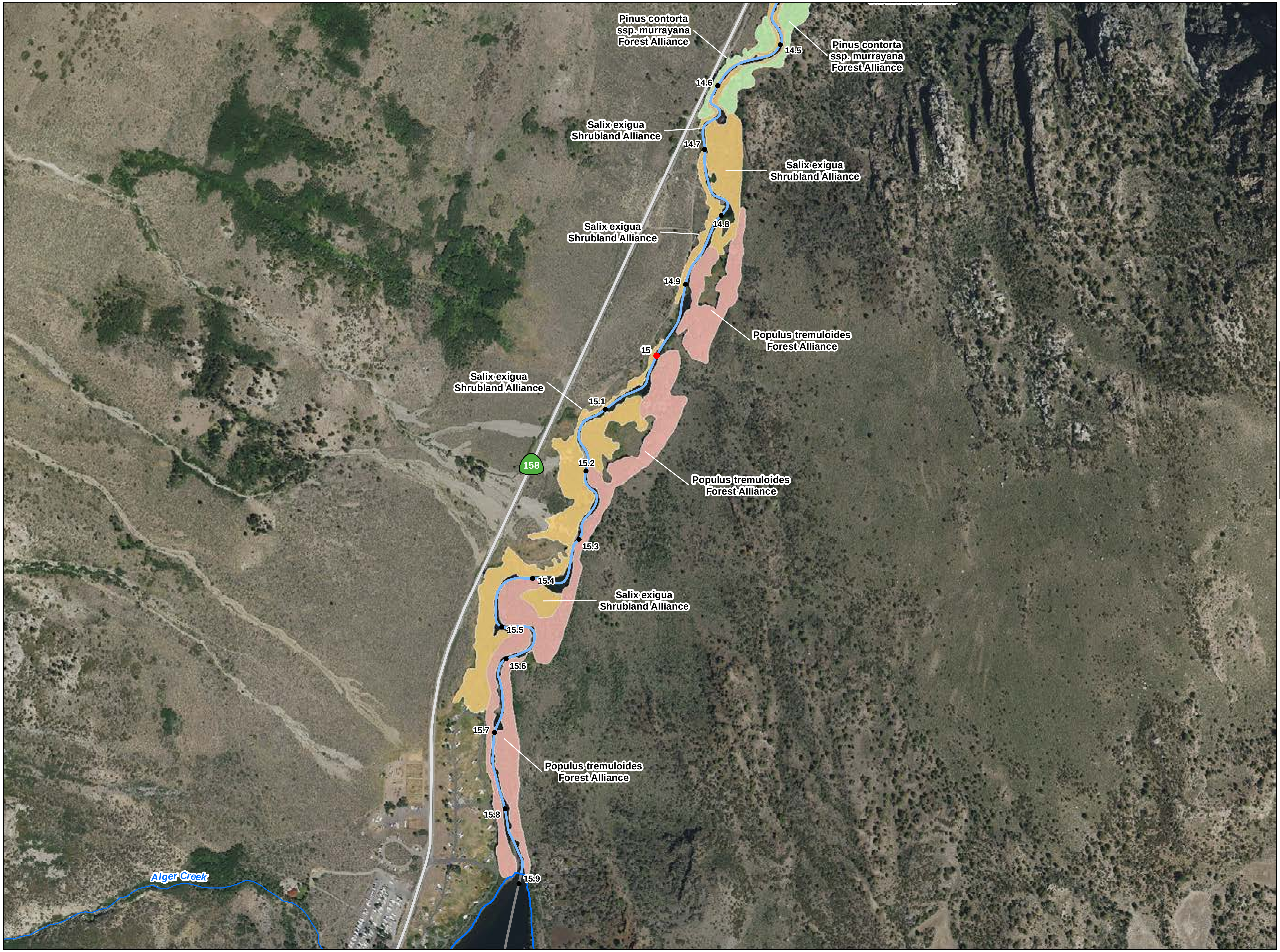
0 250 500 Feet

**Projection: UTM Zone 11**
**Datum: NAD 83**

**Date: 8/14/2024**



C:\GIS\237800343\map\Rush Creek\TerrestrialMaps\SCE_RUSH_CREEK_Riparian_Alliances_17i11i_03.mxd




**SCE Facilities**

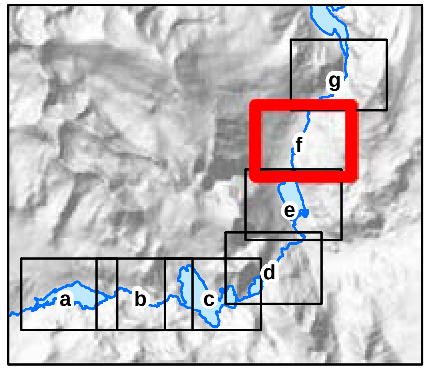
- Powerhouse
- Dam
- Stream Gage
- Reservoir Gage
- Ancillary Facility
- Helicopter Landing Site
- Water Conveyance Feature
- Tailrace
- Flowline / Penstock
- Power or Communication Line
- Tramway
- Project Road
- Project Trail
- FERC Project Boundary

**Other Features**

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

**Riparian Alliances**

- Pinus contorta ssp. murrayana Forest Alliance
- Populus tremuloides Forest Alliance
- Salix boothii – Salix geyeriana – Salix lutea Shrubland Alliance
- Salix exigua Shrubland Alliance
- Salix lasiolepis Shrubland Alliance
- Salix lemmonii Shrubland Alliance
- Salix orestera Shrubland Alliance




SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead℠

Rush Creek Project (FERC 1389)

**Map 8.8-1f**

**Riparian Vegetation Alliances on Project-Affected Stream Segments, Project Reservoirs, and Silver Lake**

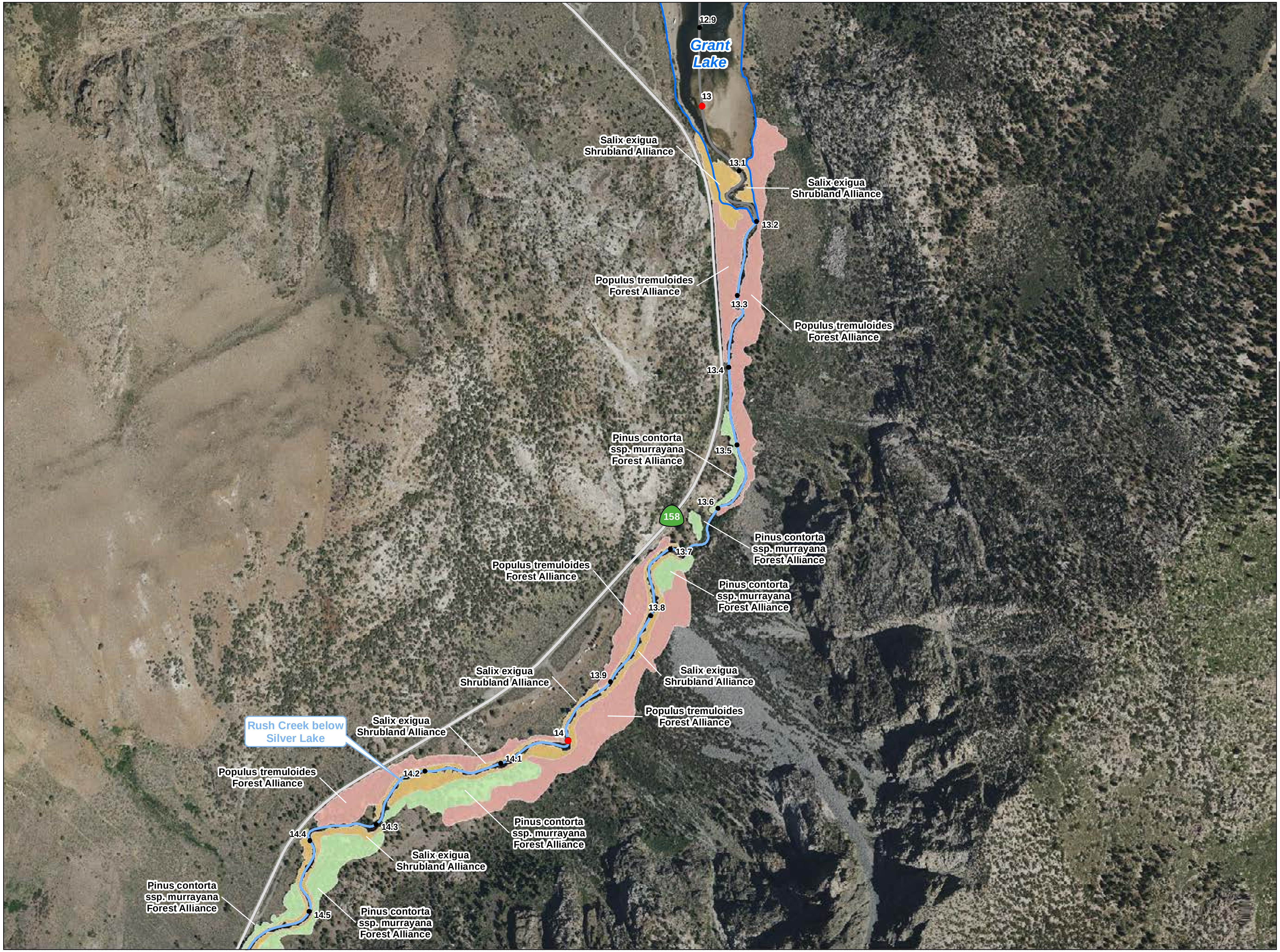
0 250 500 Feet

Date: 5/8/2024

**Projection: UTM Zone 11**
**Datum: NAD 83**



C:\GIS\237800343\map\Rush Creek\TerrestrialMaps\SCE_RUSH_CREEK_Riparian_Alliances_17i11i_02.mxd




## SCE Facilities

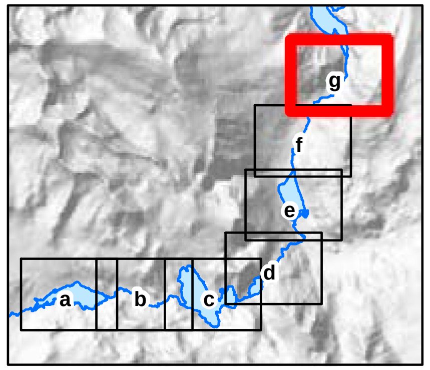
- Powerhouse
- Dam
- Stream Gage
- Reservoir Gage
- Ancillary Facility
- Helicopter Landing Site
- Water Conveyance Feature
- Tailrace
- Flowline / Penstock
- Power or Communication Line
- Tramway
- Project Road
- Project Trail
- FERC Project Boundary

## Other Features

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

## Riparian Alliances

- Pinus contorta ssp. murrayana Forest Alliance
- Populus tremuloides Forest Alliance
- Salix boothii – Salix geyeriana – Salix lutea Shrubland Alliance
- Salix exigua Shrubland Alliance
- Salix lasiolepis Shrubland Alliance
- Salix lemmonii Shrubland Alliance
- Salix orestera Shrubland Alliance




SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead

Rush Creek Project (FERC 1389)

**Map 8.8-1g**

**Riparian Vegetation Alliances on Project-Affected Stream Segments, Project Reservoirs, and Silver Lake**

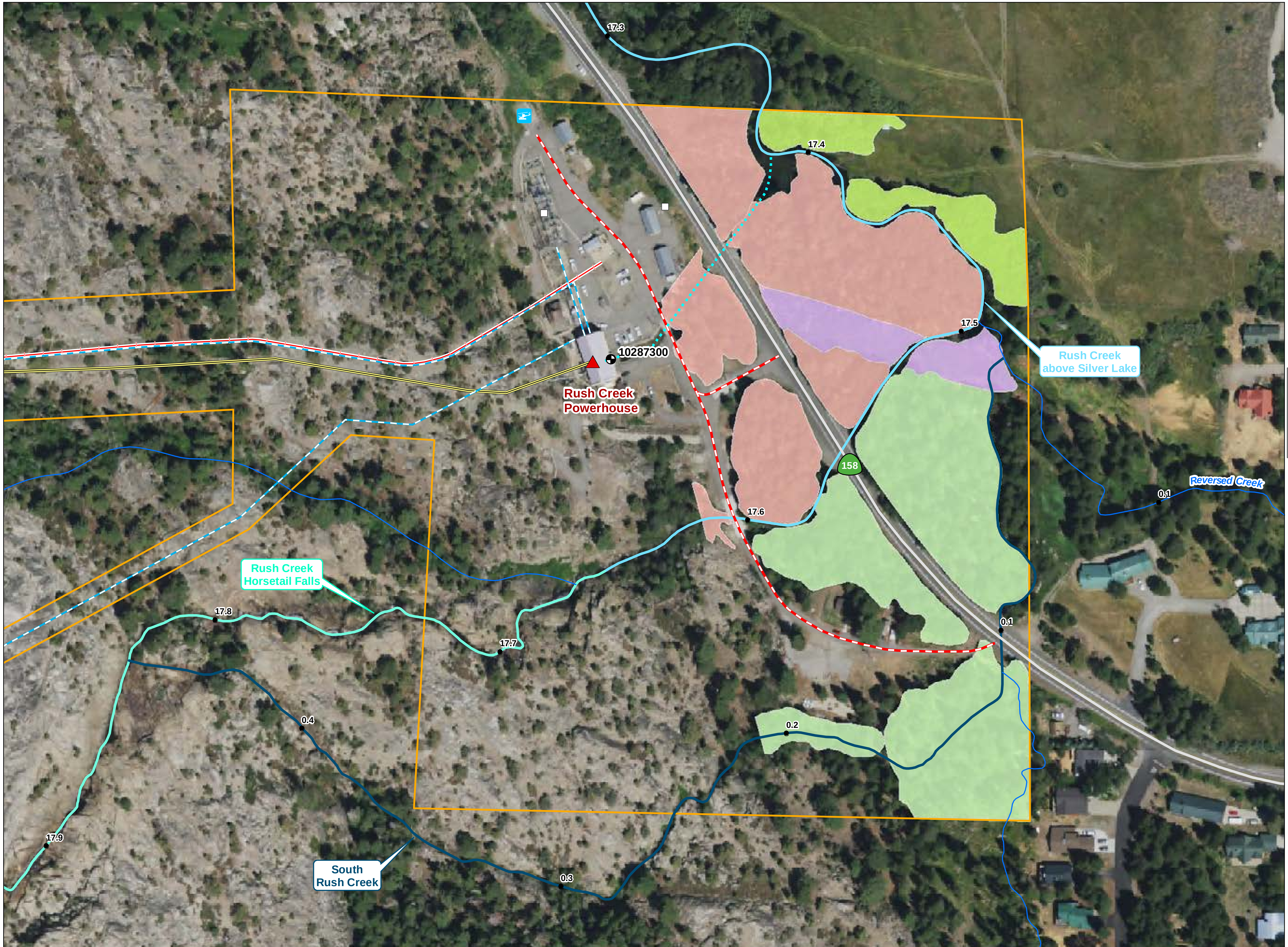
0 250 500 Feet

**Date: 5/8/2024**

**Projection: UTM Zone 11**
**Datum: NAD 83**



C:\GIS\237800343\map\Rush Creek\TerrestrialMaps\SCE_RUSH_CREEK_Riparian_Alliances_17i11i_02.mxd




**SCE Facilities**

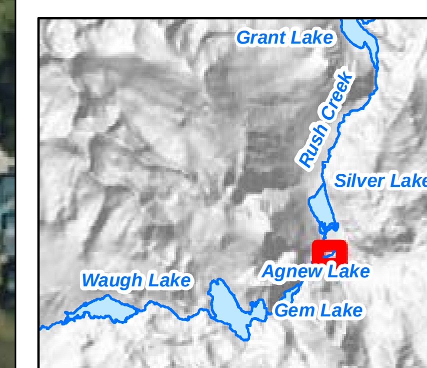
- Powerhouse
- Dam
- Stream Gage
- Reservoir Gage
- Ancillary Facility
- Helicopter Landing Site
- Water Conveyance Feature
- Tailrace
- Flowline / Penstock
- Power or Communication Line
- Tramway
- Project Road
- Project Trail
- FERC Project Boundary

**Other Features**

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

**Riparian Alliances**

- Pinus contorta ssp. murrayana Forest Alliance
- Populus tremuloides Forest Alliance
- Populus tremuloides Shrubland Alliance
- Salix boothii – Salix geyeriana – Salix lutea Shrubland Alliance




SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead℠

Rush Creek Project (FERC 1389)

**Map 8.8-2**

**Riparian Vegetation Alliances on Rush Creek and South Rush Creek**

0 50 100 Feet

Date: 8/14/2024

**Projection: UTM Zone 11**
**Datum: NAD 83**



C:\GIS\237800343\map\Rush Creek\TerrestrialMaps\SCE_RUSH_CREEK_Riparian_Alliances_RC_SRC_17i11i_01.mxd

## TABLE OF CONTENTS

Page

8.9 Land Use ........ 8.9-1
8.9.1 Information Sources ........ 8.9-1
8.9.2 Setting ........ 8.9-1
8.9.3 Land Use and Management Within the FERC Project Boundary ........ 8.9-2
8.9.4 Land Use and Management Adjacent to the FERC Project Boundary ........ 8.9-4
8.9.5 Specially Designated Areas ........ 8.9-4
8.9.6 References ........ 8.9-8

## LIST OF TABLES

Table 8.9-1. Inyo National Forest River Segments Determined to be Eligible for Inclusion in the National Wild and Scenic Rivers System ........ 8.9-11

Table 8.9-2. Scenic Highways and Byways in the Vicinity of the Project ........ 8.9-12

## LIST OF MAPS

Map 8.9-1. Land Jurisdictions ........ 8.9-14

Map 8.9-2. River Segments Determined to be Eligible for the National Wild and Scenic River System ........ 8.9-15

Map 8.9-3. Regionally and Nationally Important Recreation Areas and Trails ........ 8.9-16

Map 8.9-4. Scenic Highways and Byways ........ 8.9-17

## LIST OF ACRONYMS

| | |
|---|---|
| Area Plan | June Lake Area Plan |
| FERC | Federal Energy Regulatory Commission |
| Forest Service | United States Forest Service |
| General Plan | Mono County General Plan |
| kV | kilovolt |
| PCT | Pacific Crest Trail |
| Project | Rush Creek Project |
| SCE | Southern California Edison Company |
| SR-120 | State Route 120 |
| SR-158 | State Route 158 |
| US-395 | United States Route 395 |

## 8.9 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 (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 8.10, Recreation Resources.

### 8.9.1 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 (General Plan) (Mono County 2015);
- General Plan, Land Use Element 2020 (Mono County 2020); and
- Mono County June Lake Area Plan (Area Plan), Community Development Element and Plan Safety Element 2010 (Mono County 2010).

### 8.9.2 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, most 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, and Gem Lake) is located within the Ansel Adams Wilderness Area. Project facilities were constructed before Congress' establishment of the Ansel Adams Wilderness Area. Ansel Adams Wilderness was established as part of the original Wilderness Act in 1964 (at that time, it was designated as the Minarets Wilderness). The Wilderness Act protects existing private rights such as this Project, against the development restrictions contained in the Act. During the prior Project relicensing in the 1990s, both FERC and the Forest Service accepted the Project facilities as "non-conforming uses" because they were built before the establishment of the wilderness.

Northeast of Agnew Dam, a 135-foot-long section of the 4-kilovolt (kV) distribution line, which powers Project facilities, crosses the Owens River Headwaters Wilderness Area (designated by Congress on March 31, 2009), 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 8.9-1. 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 recreational vehicle 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 4, No-Action Alternative).

### 8.9.3 Land Use and Management Within the FERC Project Boundary

The existing FERC Project boundary encompasses 720 acres, including 688 acres of public lands administered by the Forest Service and 32 acres of SCE-owned or private land. Land use within the FERC Project boundary includes hydropower generation and dispersed recreation.

Lands located on private property in Mono County are subject to the provisions contained in the General Plan (Mono County 2015) and the June Lake Area Plan (Mono County 2010), which supplements the General Plan. Federal 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, certain Project facilities are located within the Ansel Adams Wilderness, as discussed above. In general, Wilderness lands are managed by 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.

### 8.9.3.1 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).

### 8.9.3.2 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).

### 8.9.3.3 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[1] 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).

### 8.9.3.4 Ansel Adams Wilderness Plan

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).

[1] 16 United States Code 1604 – National Forest System Land and Resource Management Plans

#### 8.9.3.5 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.

#### 8.9.3.6 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.

### 8.9.4 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.

### 8.9.5 Specially Designated Areas

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

#### 8.9.5.1 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,[2] 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

[2] Public Law 90-542; 16 United States Code 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. In accordance with the 2012 Planning Rule,[3] 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 8.9-1 for information related to the river segments determined to be eligible for inclusion in the National Wild and Scenic Rivers System and Map 8.9-2 for a depiction of their location.

### 8.9.5.2 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).

### 8.9.5.3 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 8.9-3).[4] With a few exceptions, the PCT is one continuous trail that extends more than 2,650 miles from Mexico to Canada (Forest Service 2021).

### 8.9.5.4 National Parks

The Yosemite National Park boundary is located approximately 4 miles west of Rush Meadows Dam (Map 8.9-3). 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 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 percent 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). There are no Project facilities located within Yosemite National Park.

[3] 36 Code of Federal Regulations 219.7(c)(2)(vi)

[4] Refer to Map 8.10-2 for other trails in the vicinity of the Project.

### 8.9.5.5 National Forests and Scenic Areas

#### Inyo National Forest

Most of the Project occupies federal lands within the Inyo National Forest (Map 8.9-3). 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 8.9-3). The Sierra National Forest is located on the western slope of the central Sierra Nevada, 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). There are no Project facilities located within the Sierra National Forest.

#### 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 8.9-3). 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). There are no Project facilities located within Mono Basin National Forest Scenic Area.

### 8.9.5.6 Wilderness Areas

#### Ansel Adams Wilderness

A portion of the Project (Rush Meadows Dam, Waugh Lake, and Gem Lake) is located within the Ansel Adams Wilderness Area[1] (Map 8.9-3). 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-long section of the 4-kV distribution line, which powers Project facilities, 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 8.9-3). 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 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 8.9.5.4. There are no Project facilities located within Yosemite Wilderness Area.

#### 8.9.5.7 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. 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. 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 8.9-2 provides a description, begin and end points, and official designation and Map 8.9-4 depicts their location.

### 8.9.6 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.

# TABLES

## Table 8.9-1. 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*

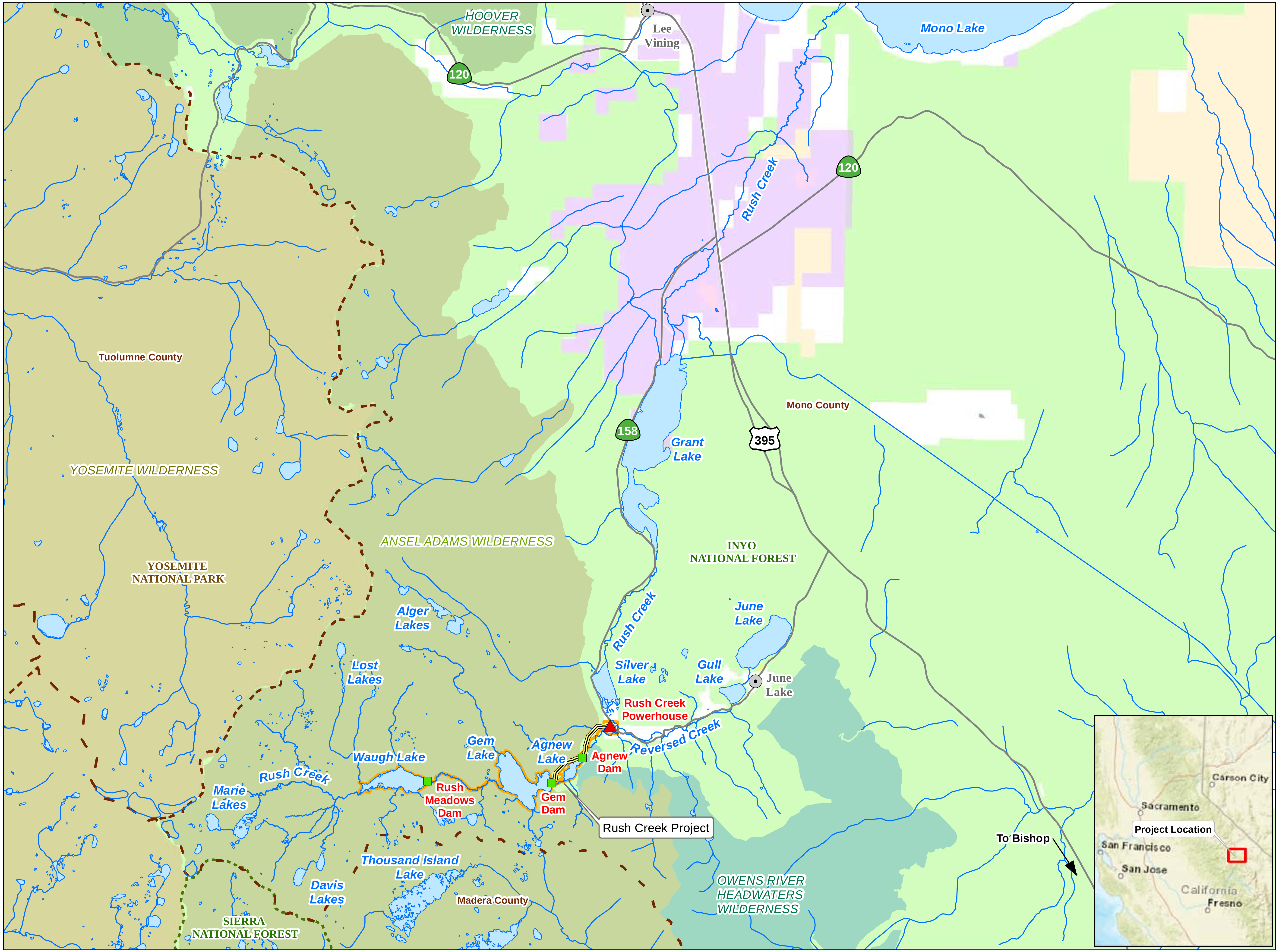
## Table 8.9-2. Scenic Highways and Byways in the Vicinity of the Project

| 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




**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
Energy for What's Ahead

Rush Creek Project (FERC 1389)

**Map 8.9-1**

**Land Jurisdictions**

0 0.5 1 2 Miles

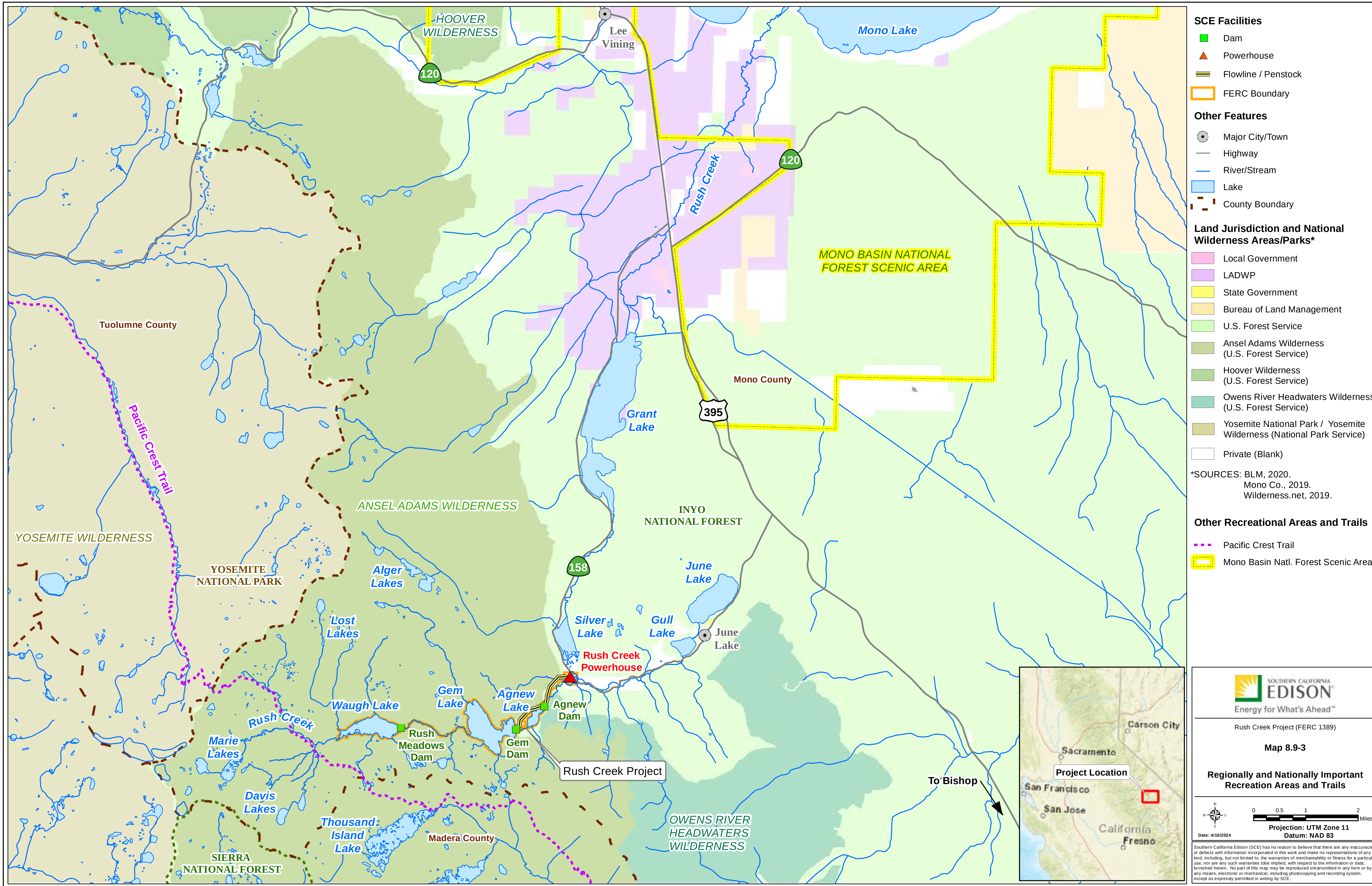
Date: 4/10/2024

**Projection: UTM Zone 11**
**Datum: NAD 83**

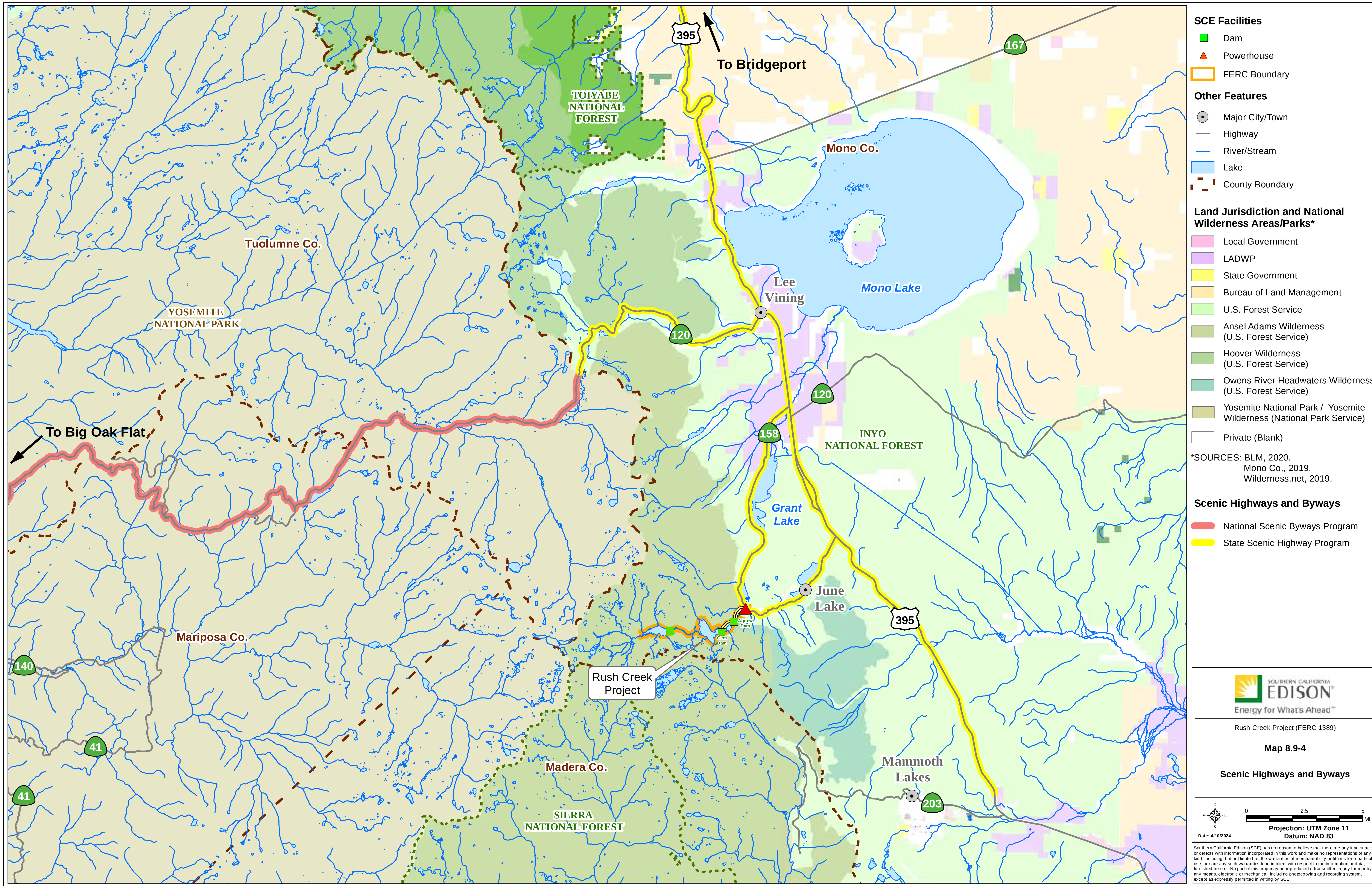


C:\GIS\237800343\map\Rush Creek\SCE_RUSH_CREEK_Juris_Vicinity_17i11i_01.mxd


C:\GIS\237800343\map\Rush Creek\LandMaps\SCE_RUSH_CREEK_NWSRS_Eligible_17i11i_01.mxd




C:\GIS\237800343\map\Rush Creek\LandMaps\SCE_RUSH_CREEK_Imp_RecAreas_Trails_17i11i_03.mxd




C:\GIS\237800343\map\Rush Creek\LandMaps\SCE_RUSH_CREEK_Scenic_Hwys_Bwys_17i11i_04.mxd

## TABLE OF CONTENTS

Page

8.10 Recreation Resources ........ 8.10-1
8.10.1 Information Sources ........ 8.10-1
8.10.2 Setting ........ 8.10-2
8.10.3 Existing Developed Recreation Facilities Within the FERC Project Boundary ........ 8.10-3
8.10.4 Existing Developed Recreation Facilities in the Vicinity of the Project ........ 8.10-3
8.10.5 Recreation Opportunities and Use in the Vicinity of the Project ........ 8.10-4
8.10.6 Current and Future Recreation Needs Identified in Management Plans ........ 8.10-7
8.10.7 References ........ 8.10-8

## LIST OF TABLES

Table 8.10-1. Developed Recreation Facilities in the Vicinity of the Rush Creek Project ........ 8.10-11

## LIST OF MAPS

Map 8.10-1. Recreation Resources Setting ........ 8.10-14

Map 8.10-2. Developed Recreation Facilities in the Vicinity of the Rush Creek Project ........ 8.10-15

## 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 |
| PCT | Pacific Crest Trail |
| Project | Rush Creek Project |
| ROS | Recreation Opportunity Spectrum |
| RV | Recreational Vehicle |
| SCE | Southern California Edison Company |
| SCORP | Statewide Comprehensive Outdoor Recreation Plan |
| SR-158 | State Route 158 |
| US-395 | United States Route 395 |

## 8.10 RECREATION RESOURCES

This section describes the recreational resources in the vicinity of Southern California Edison Company's (SCE) Rush Creek Project (Project) including 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 current and future recreation needs identified in existing management plans.

Non-recreation land use within and adjacent to the Federal Energy Regulatory Commission (FERC) Project boundary is discussed separately in Section 8.9, Land Use.

### 8.10.1 Information Sources

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

- Draft REC 1 – Recreation Draft Technical Study Report (SCE 2024);
- 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.

### 8.10.2 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. Most of the Project facilities occupy federal land within the Inyo National Forest (INF), which is under the jurisdiction of the United States Forest Service (Forest Service). 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 (non-project).

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.[2] 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 when operable (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 Exhibit A, Project Description). Several other Forest Service trails intersect the Rush Creek Trail and these are described in Section 8.10.4.

The primary Project facilities and land jurisdictions are described in Section 8.9, Land Use and shown on Map 8.9-1. Refer to Section 4, Maps 4-4a-g for detailed maps depicting the FERC Project boundary and major Project facilities.

#### 8.10.2.1 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,

[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 8.9, Land Use).

[2] SR-158 is designated as eligible for inclusion on the State Scenic Highway Program (refer to Section 8.9, Land Use).

predominately unmodified, and naturally evolving with a very high probability of solitude 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 8.10-1 displays the ROS classifications the Forest Service assigns to lands within and around the FERC Project boundary.

### 8.10.3 Existing Developed Recreation Facilities Within the FERC Project Boundary

The Project does not include any developed recreation facilities.

### 8.10.4 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 8.10-1, organized by jurisdiction and type of facility. The locations of the facilities that are identified on Table 8.10-1 are shown on Map 8.10-2.

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 to 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 land, are not part of the Forest Service's trail system. Refer to Section 4.2 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 at any time of year for day hikes (Forest Service 2021b).

### 8.10.5 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.

#### 8.10.5.1 Overnight Trail Use in the Vicinity of the Project

Based on the most recent four years of Inyo National Forest wilderness permits (2019–2022), an average of approximately 2,800 people per year obtained permits for overnight travel through the Rush Creek drainage by way of the Rush Creek Trailhead or other connecting trailheads. The wilderness permit data indicates the average group size is three individuals who, on average, stay five nights in the backcountry including one to two nights in the Rush Creek drainage. Within the Rush Creek drainage the most popular overnight camping destinations are around Gem Lake, and specifically between Gem Lake and Cress Creek (SCE 2024). The highest visitor-by-volume month is July.

### 8.10.5.2 Day Use along the Rush Creek Trail and in the Vicinity of the Project

Day use is popular along the Rush Creek trail with 5,500 day users ranging across the age spectrum estimated to have used the trail between the end of May 2023 and the beginning of November 2023 (SCE 2024). Generally, trail use is more intensive on weekend days than weekdays, and July is the month that experiences the greatest number of visitors. Hiking is the primary activity of day users along the Rush Creek trail, with a small amount of users trail running or fishing (SCE 2024).

### 8.10.5.3 Packer Use

Frontier Pack Train provides commercial mule pack trips into the Ansel Adams Wilderness from the Rush Creek Trailhead under a special-use permit from the INF. The special-use permit specifies a commercial use quota of 15 people per day with additional permit conditions pertaining to the location of the two primitive stock camps Frontier Pack Station establishes to support its trips and the number of people who may camp at the stock camps at one time. Both primitive stock camps are located between Gem and Waugh lakes, adjacent to the Rush Creek Trail.

Between 2018 and 2022, an average of 236 people per year joined the Frontier Pack Train for an overnight trip into the Rush Creek drainage by way of the Rush Creek Trailhead (SCE 2024). The average group size of overnight commercial users is eight individuals, and the highest visitor-by-volume month is July. 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 percent of total use (Forest Service 2001b).

### 8.10.5.4 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 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.

### 8.10.5.5 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 8.4). 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 8.4). 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. 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).

Based on survey data collected from anglers along the Rush Creek Trail between late May to early November of 2023 (SCE 2024) the most common fishing location upstream of the powerhouse is Gem Lake, however the anglers surveyed reported fishing in all the major upstream waterbodies in the Rush Creek drainage including Rush Creek, Agnew, Gem, and Waugh lakes. Anglers also reported fishing in Thousand Island Lake, and Clark Lakes (areas accessible by trails intersecting with the Rush Creek Trail). The most common fish species caught based on angler reports was brook trout, followed by rainbow trout. Anglers reported releasing most fish caught (SCE 2024).

#### 8.10.5.6 Water Recreation

Above the powerhouse, water recreation in Rush Creek, Agnew, Gem, and Waugh lakes is generally limited to wading and swimming activities. 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. Less than 10 Rush Creek Trail day users indicated swimming as a primary recreation activity when surveyed in the summer of 2023 (SCE 2024). 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.

#### 8.10.5.7 Winter Recreation

June Mountain Ski Area is a winter resort near the community of June Lake about 2 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.

### 8.10.6 Current and Future Recreation Needs Identified in Management Plans

Although Mono County has a population of under 14,000 (USCB 2022) and just a 1 percent projected growth rate between 2020 and 2023 (California Department of Finance 2023), a recent study conducted by Mono County Economic Development that measured the economic and fiscal impacts of visitors to the county identified that Mono County attracts nearly two million non-local visitors on a year-round basis due to its outdoor activities (Mono County 2019). During 2018, 39 percent of visitors to the county said they were likely to return due to the area's outdoor recreation (Mono County 2019). Consistent with the county's study, recent recreation use data collected from both overnight visitors and day users of the Rush Creek Trail (SCE 2024) found that most trail users were not local residents.[3] Of the visiting trail users, most hailed from some other part of California. Specifically, approximately 64 percent of overnight non-commercial use visitors and 83 percent of day users identified a home location in California (SCE 2024). Therefore, population growth projections and recreation use trends for California are appropriate to reference with respect to the recreation use in vicinity of the Rush Creek Project.

The California Department of Parks and Recreation updates the Statewide Comprehensive Outdoor Recreation Plan (SCORP) every 5 years. 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. In general, recreation opportunities with projected increased demand in the 2020 SCORP (the most current SCORP) include those recreational activities (hiking, running, non-motorized water sports, wildlife viewing) available in the vicinity of the Rush Creek Project. The 2020 SCORP also identified that a need in California is to conserve larger landscapes and habitats to provide hiking, camping, and other recreational opportunities (CDPR 2015).

While the population growth projections for California are minimal, given trends demonstrating increasing interest in dispersed recreation activities such as those identified in the Mono County Economic Development study, in the SCORP, and by an increase in overnight trips into the Rush Creek drainage since the late 1990s,[4] it is reasonable to assume that the Rush Creek Watershed from its headwaters near Mt. Lyell to Rush Creek confluence with Grant Lake will continue to grow in popularity as a destination for dispersed outdoor recreation over the next Project license period.

3 Local users were defined as those with a home zip code location anywhere between Bridgeport, California and Lone Pine, California.

4 Based on Forest Service wilderness permit data collected between 2019–2022 compared to wilderness permit data collected from 1996–2000, overnight trips into the Rush Creek drainage have, on average, increased 160 percent.

### 8.10.7 References

California Department of Finance. 2023. Demographic Research Unit. Report P-1A: Total Population Projections, California, 2020-2060 (Baseline 2019 Population Projections; Vintage 2023 Release). Sacramento: California. July 2023. Available at: https://dof.ca.gov/forecasting/demographics/projections/. Accessed December 2023.

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/detailfull/inyo/landmanagement/planning/?cid=FSBDEV3_003888.

———. 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.

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

———. 2019. Profile of Mono Visitors & Economic Impacts of Tourism. July 2019. Available https://monocounty.ca.gov/sites/default/files/fileattachments/economic_development/page/31221/mono_co_2018_visitor_econ_imp_study_report.pdf. Accessed December 2023.

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.

SCE (Southern California Edison Company). 2024. Draft REC 1 – Recreation Technical Study Report. August. Available in Supporting Document A of the Application for New License.

USCB (United States Census Bureau). 2022. American Community Survey 2022, American Community Survey 1-Year Estimates Detailed Tables.

# TABLES

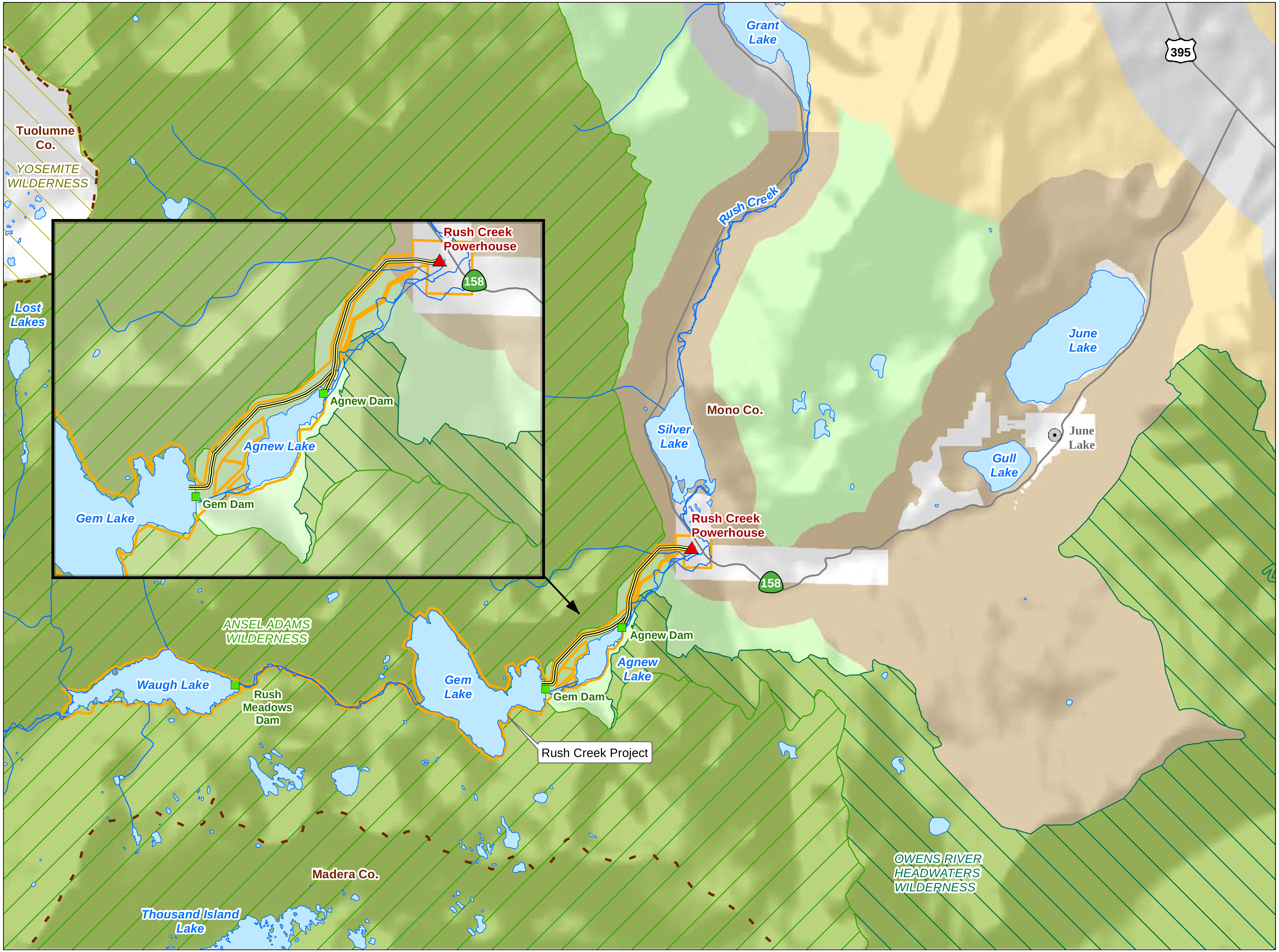
**Table 8.10-1. Developed Recreation Facilities in the Vicinity of the Rush Creek Project**

| 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 |

Note:
*This list of facilities is reflected in Map 8.10-2.

# MAPS




**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
Energy for What's Ahead℠

Rush Creek Project (FERC 1389)

**Map 8.10-1**

**Recreation Resources Setting**

N W E S

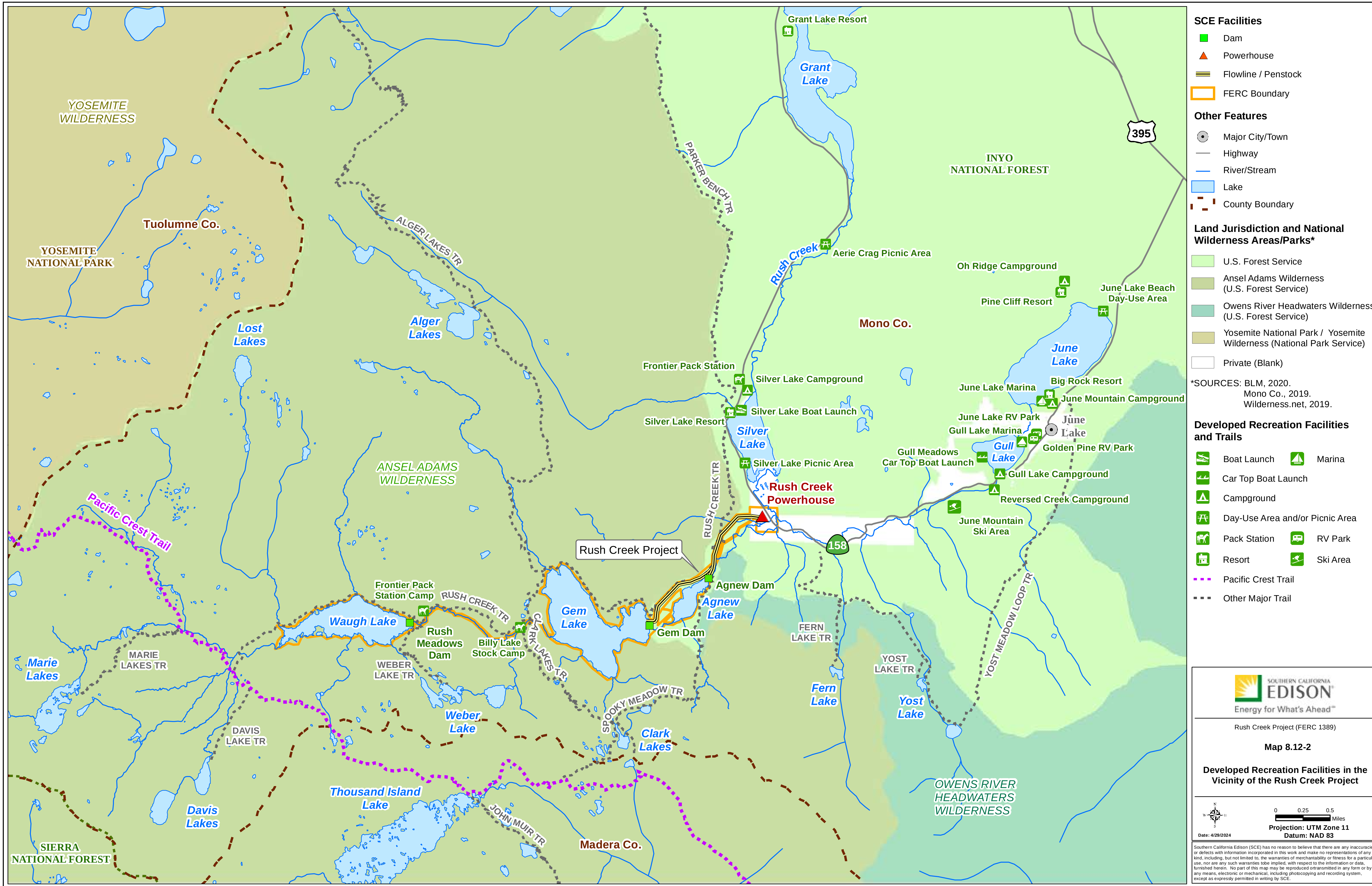
Date: 4/29/2024

0 0.25 0.5 Miles

**Projection: UTM Zone 11**
**Datum: NAD 83**



C:\GIS\237800343\map\Rush Creek\RecMaps\SCE_RUSH_CREEK_RecResSetting_17i11i_01.mxd




C:\GIS\237800343\map\Rush Creek\RecMaps\SCE_RUSH_CREEK_DevRecFac_17i11i_02.mxd

## TABLE OF CONTENTS

Page

8.11 Aesthetics ........ 8.11-1
8.11.1 Information Sources ........ 8.11-1
8.11.2 Overview of the Scenery Management System ........ 8.11-1
8.11.3 Description of Existing Condition ........ 8.11-3
8.11.3.1 Rush Meadows Dam Area ........ 8.11-4
8.11.3.2 Gem Dam Area ........ 8.11-6
8.11.3.3 Agnew Dam Area ........ 8.11-7
8.11.3.4 Rush Creek Powerhouse Area ........ 8.11-8
8.11.4 References ........ 8.11-9

## LIST OF TABLES

Table 8.11-1. Rush Creek Project Facilities Scenic Integrity Objectives ..... 8.11-11

## LIST OF MAPS

Map 8.11-1. Scenic Integrity Objectives in the Vicinity of the Rush Creek Project ........ 8.11-16

## LIST OF APPENDICES

Appendix 8.11-A Representative Photographs

## 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-158 | State Route 158 |

## 8.11 AESTHETICS

This section describes the aesthetic resources in the vicinity of Southern California Edison Company's (SCE) Rush Creek Project (Project). This section also 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.

### 8.11.1 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, Federal Energy Regulatory Commission (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);
- Wilderness Management Plan for the Ansel Adams, John Muir, and Dinkey Lakes Wildernesses, Inyo and Sierra National Forests (Forest Service 2001); and
- Draft LAND 1 – Aesthetics Technical Study Report (SCE 2024).

### 8.11.2 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 8.11-1 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 8.11-1 identifies the above-ground Project facilities and the SIO associated with the landscapes in which the facilities are located. Appendix 8.11-A includes representative photographs of the landscape surrounding the Project facilities.

### 8.11.3 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. Most 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, and Gem Lake) is located within the Ansel Adams Wilderness, but 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 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.

These FERC-mandated seismic restrictions 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 8.10, Recreation, 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 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 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 4, No-Action Alternative for additional information on Project facility specifications and Maps 4-4a-g for the location of Project facilities discussed in this section.

### 8.11.3.1 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, a 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.[2]

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 lakebed 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 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 8.11-1 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.

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

### 8.11.3.2 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 face of the dam.[3]

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.

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.

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

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

Table 8.12-1 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. Most 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.

#### 8.11.3.3 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-kilovolt (kV) Agnew Distribution Line and Agnew Dam Tap 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 8.11-1 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.”

#### 8.11.3.4 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 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 the 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 Distribution 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 lines 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 8.11-1 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.

### 8.11.4 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 (United States Forest Service). 1995. Landscape Aesthetics – A Handbook for Scenery Management. Agricultural Handbook Number 701. December.

———. 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.

SCE (Southern California Edison Company). 2024. Draft LAND 1 – Aesthetics Technical Study Report. August. Available in Supporting Document A of the Application for New License.

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

## Table 8.11-1. 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 |

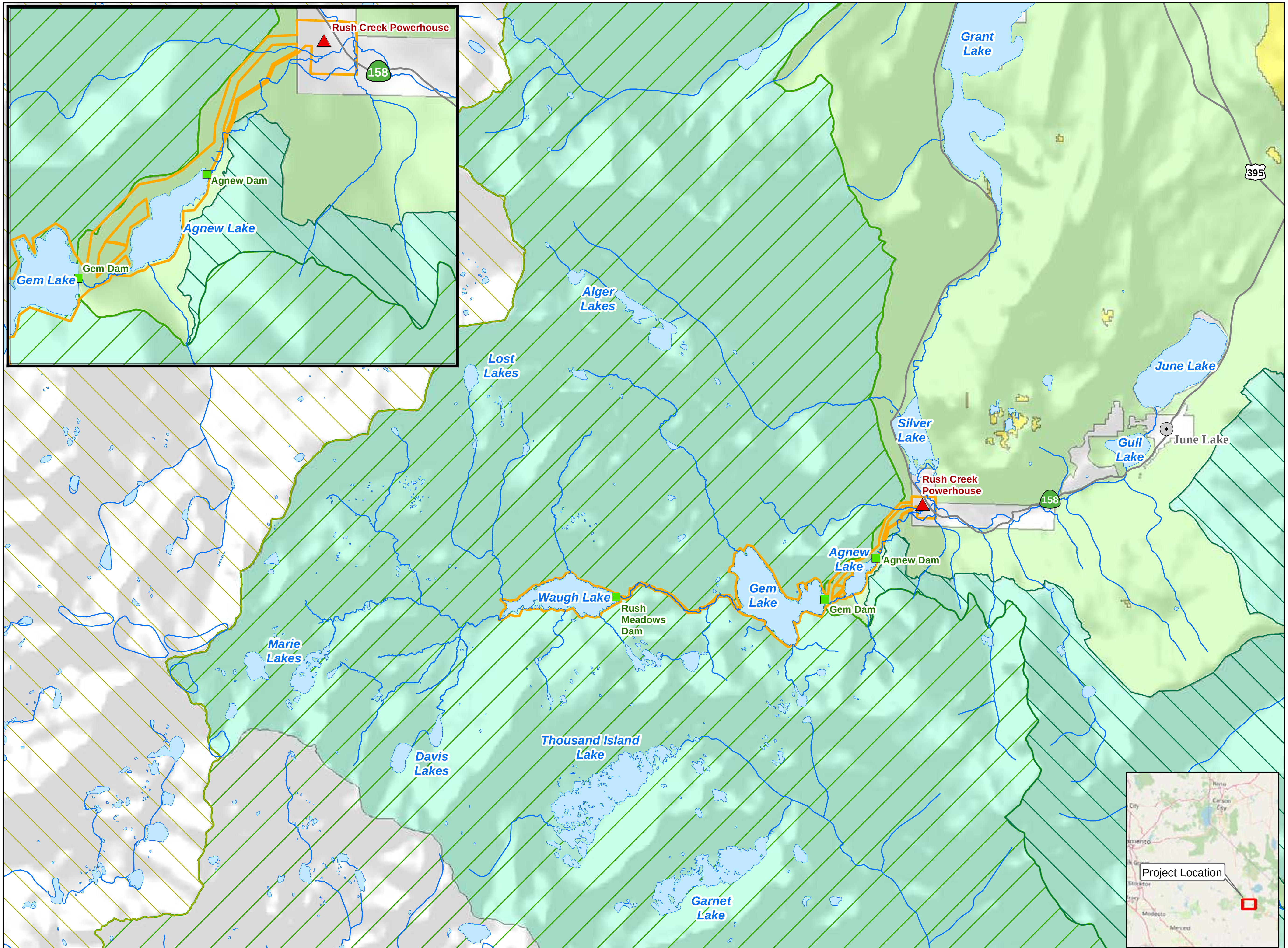
| Project Facility | Land Ownership/ Jurisdiction | Scenic Integrity Objective (as applicable) |
|---|---|---|
| ***Reservoir Gages*** | | |
| Gem Lake (USGS No. 10287280; SCE No. 352) | Forest Service | High |
| ***Communication Lines*** | | |
| Communication Line from Rush Creek Powerhouse to Gem Lake 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 Agnew Distribution Line | Forest Service | High |
| 4-kV Agnew Dam Tap Line | Forest Service | High |
| 4-kV Upper Agnew Boat Dock Tap Line | 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 |

| Project Facility | Land Ownership/ Jurisdiction | Scenic Integrity Objective (as applicable) |
|---|---|---|
| ***Agnew Dam/Lake Ancillary and Support Facilities*** | | |
| Lower Agnew Lake Boathouse / Dock | Forest Service | High |
| Upper Agnew Lake Boathouse / Dock | Forest Service | High |
| 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 |
| ***Power Line*** | | |
| 2.4-kV Switchyard to Powerhouse Distribution 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




**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
Energy for What's Ahead℠

Rush Creek Project (FERC 1389)

**Map 8.11-1**

**Scenic Integrity Objectives in the Vicinity of the Rush Creek Project**

0 0.5 1 Miles

**Date: 4/26/2024**

**Projection: UTM Zone 11**
**Datum: NAD 83**



C:\GIS\237800343\map\Rush Creek\LandMaps\SCE_RUSH_CREEK_SIO_Overview_17i11i_01.mxd

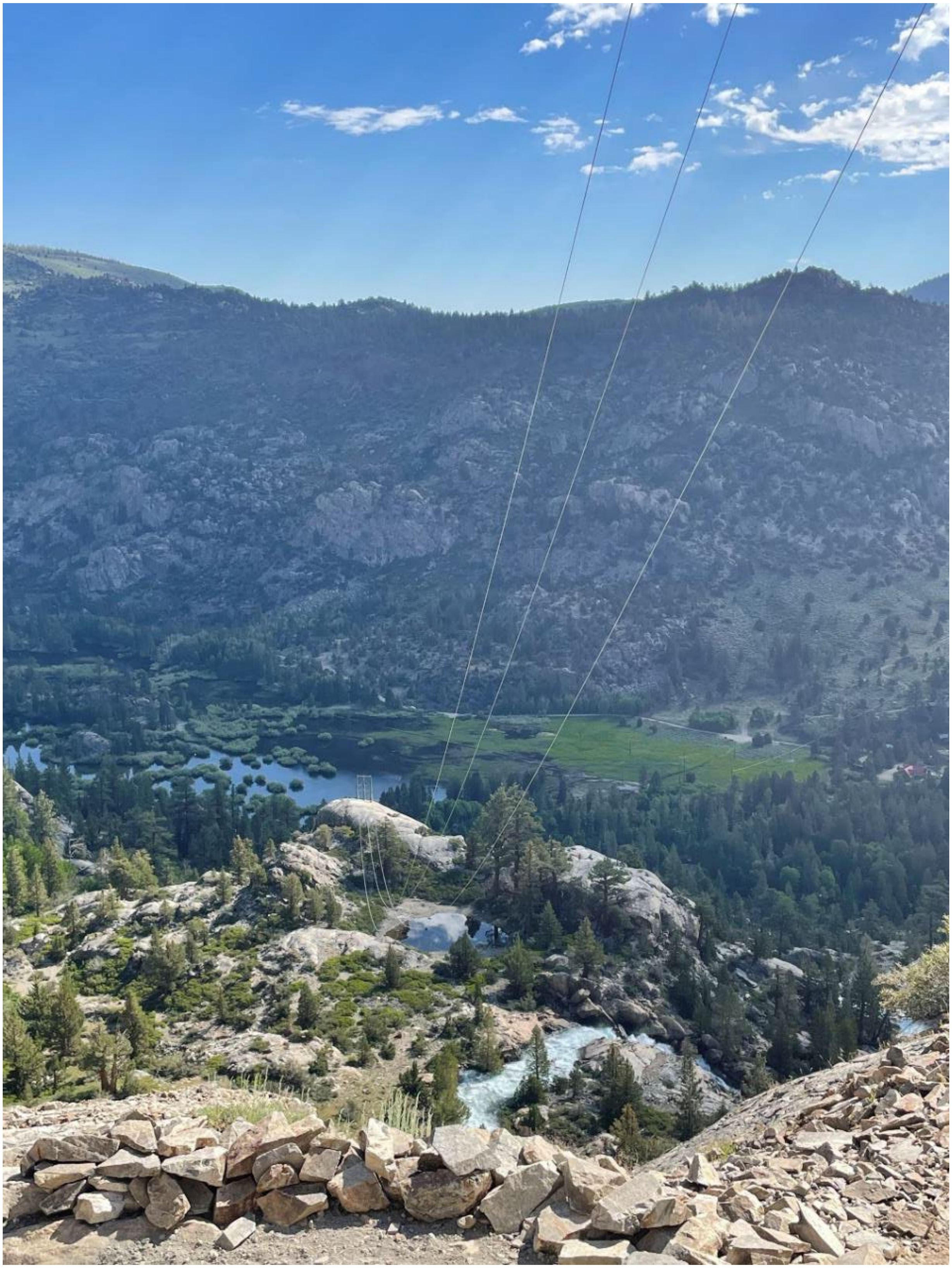
# APPENDIX 8.11-A

## Representative Photographs

**Photo A-1. Rush Creek Powerhouse and Switchyard (non-project facility) (looking west)**

Note: July 17, 2023 (37.7655, −119.13)

**Photo A-2. Penstock and Tram Tracks**



Note: July 17, 2023 (37.7628, −119.129)

**Photo A-3. Agnew 4-kV Line**

Note: July 17, 2023. (37.7593, −119.132)

**Photo A-4. Agnew Dam and Ancillary Facilities—View from Downstream**

Note: July 17, 2023 (37.7579, −119.132)

**Photo A-5. Agnew Lake and Dam at Shoreline—(looking upstream toward Gem Dam)**

Note: July 17, 2023 (37.7579, −119.132)

**Photo A-6. Agnew Dam at Shoreline**

Note: July 17, 2023 (37.7574, −119.135)

**Photo A-7. Agnew Lake—View from Upstream**

Note: July 17, 2023 (37.7528, −119.141)

**Photo A-8. Agnew Lake and Dam—View from Above**

Note: July 17, 2023 (37.7525, −119.141)

**Photo A-9. Gem Dam**

Note: July 19, 2023 (37.7546, −119.144)

**Photo A-10. Gem Dam—View from Upstream (looking east)**

Note: July 17, 2023 (37.7535, −119.148)

**Photo A-11. Gem Lake (looking south)**

Note: July 18, 2023 (37.7512, −119.181)

**Photo A-12. Rush Meadows Dam—View from Downstream**

Note: September 26, 2023 (37.7501, −119.182)

**Photo A-13. Rush Meadows Dam—View from Weber Lake Trail**

Note: September 26, 2023 (37.7517, −119.181)

**Photo A-14. Rush Meadows Dam**

Note: August 31, 2023 (37.7519, −119.182)

**Photo A-15. Waugh Lake—View from Rush Creek Trail Near Dam (looking upstream)**

Note: September 26, 2023 (37.7528, −119.185)

**Photo A-16. Rush Meadows Dam—View from Upstream Toward Dam**

Note: September 26, 2023 (37.7529, −119.195)

**Photo A-17. Waugh Lake—Northern Shoreline (looking upstream)**

Note: September 26, 2023 (37.7529, −119.195)

**Photo A-18. Waugh Lake—Northern Shoreline (looking downstream)**

Note: July 18, 2023 (37.7529, −119.195)

**Photo A-19. Waugh Lake—Northern Shoreline (looking downstream)**

Note: September 26, 2023 (37.7499, −119.201)

**Photo A-20. Waugh Lake—Western End (looking upstream)**

Note: September 26, 2023 (37.7468, −119.215)

**Photo A-21. Waugh Lake from the Pacific Crest Trail**

## TABLE OF CONTENTS

Page

8.12 Cultural Resources ........ 8.12-1
8.12.1 Information Sources ........ 8.12-1
8.12.2 Area of Potential Effects and Study Area ........ 8.12-2
8.12.3 Physical Environment and Climate and Cultural Contexts ........ 8.12-2
8.12.4 Archaeological Resources ........ 8.12-2
8.12.5 Built Environment Resources ........ 8.12-4
8.12.6 Tribal Interests and Traditional Cultural Properties ........ 8.12-4
8.12.7 Current Cultural Resource Management ........ 8.12-5
8.12.8 References ........ 8.12-5

## LIST OF TABLES

Table 8.12-1. Previously Recorded Archaeological Sites within the FERC Project Boundary ........ 8.12-8

## LIST OF MAPS

Map 8.12-1. Cultural Resources Area of Potential Effects and Study Area ..... 8.12-10

## List of Acronyms

| | |
|---|---|
| APE | area of potential effects |
| BP | before the present |
| CFR | Code of Federal Regulations |
| CHRIS | California Historical Resources Information System |
| FERC | Federal Energy Regulatory Commission |
| Forest Service | United States Forest Service |
| HAPP | Historic and Archaeological Protection Plan |
| NAHC | Native American Heritage Commission |
| NRHP | National Register of Historic Places |
| OHP | California Office of Historic Preservation |
| Project | Rush Creek Project |
| RCHS | Rush Creek Hydroelectric System |
| RCHSHD | Rush Creek Hydroelectric System Historic District |
| RMAD | Rush Meadows Archaeological District |
| SCE | Southern California Edison Company |
| SHPO | State Historic Preservation Officer |
| TSP | Technical Study Plan |
| TSR | Technical Study Report |

## 8.12 CULTURAL RESOURCES

This section describes cultural resources in the vicinity of Southern California Edison Company's (SCE) Rush Creek Project (Project). This section provides: (1) a description of the known cultural resources and historic properties within the Federal Energy Regulatory Commission (FERC) Project boundary, including identification of properties that are listed on, or eligible for listing on, the National Register of Historic Places (NRHP) and summarizes SCE's current cultural resource management efforts.

Preliminary information regarding implementation of the CUL 1 – Built Environment Technical Study Plan (TSP) and CUL 2 – Archaeology TSP is presented in the section. The Draft CUL 1 – Built Environment Technical Study Report (TSR) (Riggs, Boswell, and Walton 2024) and Draft CUL 2 – Archaeology TSR (Canoff et al. 2024) are being reviewed by SCE, the United States Forest Service (Forest Service) and other stakeholders. More complete information will be provided in the Final License Application.

### 8.12.1 Information Sources

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

- 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 2020).
- A records search was conducted using the ArcGIS Online database maintained by SCE. That database includes data shared by Forest Service Region 5, as well as data obtained (via subscription) from the California Historical Resources Information System (CHRIS).
- CHRIS Eastern Information Center Records Search received on March 15, 2021.
- A supplementary records search was conducted at the Forest Service, Inyo National Forest Supervisor's Office July 2023, immediately preceding the fieldwork.

**Rush Creek Cultural TSRs:**

- Canoff, Alyssa, Kaitlin Harstine, Mark Sutton, and Emily Holt. 2024. *Draft CUL 2 – Archaeological Resources Technical Study Report for the Rush Creek Project (FERC Project No. 1389).* On file at Southern California Edison Company, Rosemead, California.

- Riggs, Becca, Lauren Walton, and Sharon Boswell. 2024. *Draft CUL 1 – Built Environment Technical Study Report for the Rush Creek Project (FERC Project No. 1389).* On file at Southern California Edison Company, Rosemead, California.

### 8.12.2 Area of Potential Effects and Study Area

A Project's area of potential effects (APE) is defined in the regulations implementing section 106 of the National Historic Preservation Act as "the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist" (36 Code of Federal Regulations [CFR] 800.16[d]). Additionally, the Advisory Council on Historic Preservation and the California Office of Historic Preservation (OHP) have provided guidance for federal agencies and their delegated licensees to consider potential effects that may occur immediately and directly, are reasonably foreseeable or may occur later in time, are farther removed in distance and potentially affected indirectly, and/or include cumulative effects of/related to the undertaking. For the purposes of study implementation, the Project APE is defined as the entire area within the FERC Project boundary (Map 8.12-1).

The APE was discussed during technical working group study plan meetings in the spring of 2022, and comments were incorporated into the Revised Study Plans, which were submitted to FERC in September 2022. SCE submitted the proposed APE, on behalf of FERC, to the State Historic Preservation Officer (SHPO) for comments on the adequacy of the APE pursuant to 36 CFR 800.16[d]) on February 14 and October 20, 2023 (SCE 2023).

On January 5, 2024, SCE received comments from the SHPO (FERC831003A) on the adequacy of the APE. The SHPO requested that a vertical APE be added for all the Project alternatives and agreed that, based on the horizontal APE, the proposed study areas are appropriate given the scope of the undertaking. The SHPO also advised that modification of the APE may be necessary, depending on the results of the built-environment, archaeological, and Tribal resource studies, if resources extended beyond the FERC Project boundary.

### 8.12.3 Physical Environment and Climate and Cultural Contexts

Updated information for this section is being reviewed and will be provided in the Final License Application.

### 8.12.4 Archaeological Resources

Background research and archaeological survey of the APE were conducted in 2023 under a Forest Service Organic Act Permit (LVD23017 executed on July 25, 2023) and pursuant to the CUL 2 – Archaeology TSP.

The most extensive archaeological studies within the Project APE, prior to the current one were conducted during the previous relicensing effort in the late 1980s and mid-1990s. Archaeological investigations, excavations, and evaluations, such as those of Clay and Hall (1988, 1989), Jackson generally found sites containing obsidian debitage, formal lithic tools, and the occasional ground stone artifacts that date to the Archaic period (7,500–700 before the present [BP]) and represent the Mojave (pre-5,500 BP), Little Lake (5,500–3,200 BP), Newberry (3,200–1,400 BP), and Haiwee (1,400–700 BP) periods. Some contributing elements also date to the late precontact Marana Period (600–150 cal BP). As a result of these studies, the Rush Meadows Archaeological District (RMAD) was documented and recommended eligible for listing in the NRHP (the SHPO concurred with this evaluation in various letters included in the Historic and Archaeological Protection Plan (HAPP) [White 1990]). The RMAD was found eligible for listing in the NRHP under Criterion D for data potential to address research themes such as high-altitude resource regimes, early high-altitude activity, regional chronology, Holocene environment, high-altitude site structures, high-altitude faunal regimes, high-altitude floral regimes, lithic processing, tool kits, trans–Sierra Nevada trade, upland abandonment, and Numic expansion. A period of significance was not given.

Additionally, pollen cores from previous excavations within the RMAD show a tephra or ash layer blanketing an organic-rich silt (dated to ca. 1715–2138 radiocarbon years before present) and a paleosol containing abundant cultural remains (Jackson and Morgan 1999). This tephra is likely from eruptions within Mono Lake. Tephra layers from these recent eruptions have also been found in archaeological sites in Tuolumne Meadows north of the Project in Yosemite National Park (Hall 1983; Hull 2007; Montague 1996a, 1996b). Information on the paleoenvironment recovered from previous excavations at sites within the Project also showed that forests and meadows in the region appeared around 5,000–3,000 years ago (during the Early to Middle Archaic period), that periodic volcanic eruptions deposited tephra layers across the region that periodically disrupted human occupation in the region, and that extensive wildfires periodically impacted the area.

Precontact sites found in the Project APE consist of lithic scatters with diagnostic tools, and portable milling stones, hand stones, and pestles. Most of the precontact sites within the APE are associated with the RMAD.

Historic-era sites within the APE generally consist of refuse dumps and other resources related to the construction or operation of the Rush Creek Hydroelectric System (RCHS).

A total of 16 previously recorded archaeological sites are located within the Project APE. Of these seven are precontact sites, four are historic-era sites and five are multicomponent (precontact and historic-era) sites. One site (P-26-004619) a historic-era arborglyph was not relocated (Table 8.12-1). Over 20 new sites and over 20 isolates were recorded as part of the CUL 2 survey. These are currently under review.

All the recorded archaeological sites are located on lands administered by the Forest Service; two of them also extend onto SCE-managed land. All but one of the isolates is on Forest Service land.

### 8.12.5 Built Environment Resources

Archival research and a built environment resource survey of the APE were conducted in 2023 under a Forest Service Organic Act Permit (LVD23017 executed on July 25, 2023) and pursuant to the CUL 1 – Built Environment TSP.

As part of the previous relicensing studies, SCE evaluated most facilities associated with the RCHS 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 RCHS includes a hydroelectric-themed NRHP Historic District, the Rush Creek Hydroelectric System Historic District (RCHSHD). The 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. The RCHSHD was found to qualify 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 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.

All built environment resources associated with the RCHSHD were revisited as part of the CUL 1 – Built Environment TSP implementation and re-evaluated as contributing or non-contributing features of the district. Additional built environment resources not previously recorded were also recorded and evaluated as part of the RCHSHD or as stand-alone built resources. These results are currently being reviewed by SCE and the Forest Service; results will be included in the Final License Application.

### 8.12.6 Tribal Interests and Traditional Cultural Properties

Tribal engagement for the identification of Tribal interests and Traditional Cultural Properties was conducted under the TRI 1 – Tribal Resources TSP (see Section 8.13).

### 8.12.7 Current Cultural Resource Management

SCE prepared a Cultural Resource Management Plan for the Rush Creek Project in 1990 called, “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 Plan identifies specific measures that SCE undertakes to avoid adverse effects to NRHP-eligible cultural resources in the FERC Project boundary. The Plan 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 Plan 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.

### 8.12.8 References

Canoff, Alyssa, Kaitlin Harstine, Mark Sutton, and Emily Holt. 2024. *CUL 2 – Archaeological Resources Technical Study Report for the Rush Creek Project (FERC Project No. 1389).* On file at Southern California Edison Company, Rosemead, California.

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

Clay, Vickie L., and M.C. Hall. 1988. *Results of the 1987 Field Season, Cultural Resources Survey for the Historic and Archaeological Preservation Plan for the Lee Vining Creek Hydroelectric Project (FERC Project Number 1388) and the Rush Creek Hydroelectric Project (FERC Project Number 1389) ARR 05-04-441.* Southern California Edison, Rosemead.

———. 1989. *Results of the 1988 Field Season Cultural Resource Survey for the Historic and Archaeological Preservation Plan for the Rush Creek Hydroelectric Project (FERC Project No. 1389) (ARR 05-04-441, Addendum 1). Archaeological Research Services, Rohnert Park, California.* Prepared for Southern California Edison Company, Rosemead.

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. PhD dissertation, Department of Anthropology, University of California, Riverside.

Hull, Kathleen L. 2007. The Sierra Nevada: Archaeology in the Range of Light. In *California Prehistory: Colonization, Culture, and Complexity,* edited by Terry L. Jones and Kathryn A. Klar, pp. 177–190. Altamira Press, Lanham, Maryland.

Jackson, Thomas L., and Christopher Morgan. 1999*. Archaeological Data Recovery Program, Rush Meadow Archaeological District, Ansel Adams Wilderness, Inyo National Forest, California. Pacific Legacy, Santa Cruz, California*. Prepared for Southern California Edison Company, Rosemead, California.

Montague, S. 1996a. *The Dana Meadows Archeological Testing Project, Yosemite National Park, Tuolumne County, California*. National Park Service, Yosemite National Park, Yosemite Research Center, Publications in Anthropology No. 19.

———. 1996b. *Test Excavation at CA-TU0-120, Yosemite National Park, Tuolumne County, California*. National Park Service, Yosemite National Park, Yosemite Research Center, Technical Report No. 2.

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

Riggs, Becca, Lauren Walton, and Sharon Boswell. 2024. *CUL 1 – Built Environment Technical Study Report for the Rush Creek Project (FERC Project No. 1389).* On file at Southern California Edison Company, Rosemead, California.

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.

———. 2023. Letter from SCE Principal Manager to SHPO, re: Section 106 Consultation: Proposed Area of Potential Effects for the Southern California Edison (SCE) Rush Creek Project Cultural and Tribal Relicensing Studies (CUL 1, CUL 2, TRI 1), FERC Project No. 1389, February 14, 2023. Southern California Edison Company, Rosemead, California.

White, David. 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.

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.

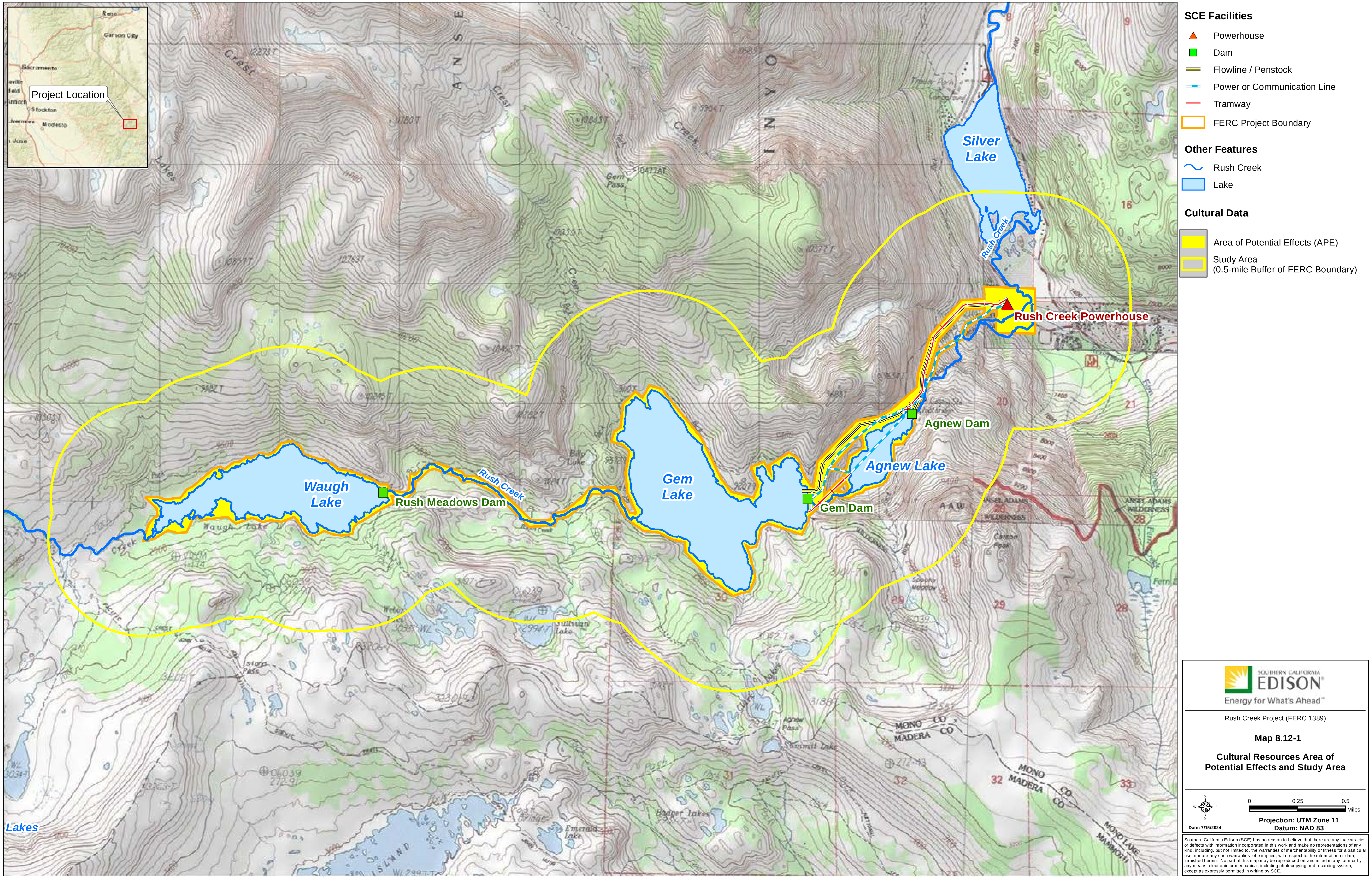
# TABLES

## Table 8.12-1. Previously Recorded Archaeological Sites within the FERC Project Boundary

| Primary No. P-26- | Trinomial CA-MNO- | Forest Service No. 05-04-51- | Site Type[1] | Description | Part of RMAD | Previous Site Eligibility (White 1990) | Recommended Eligibility Post Data Recovery[2] |
|---|---|---|---|---|---|---|---|
| 000430/002462 | 430/H/2462 | 1146/1171 | M | Precontact obsidian scatter, handstone, projectile point. Historic era mining or quarry site likely associated with construction of Rush Meadows Dam. | Yes | P-430 precontact and historic components not eligible; P-2462 eligible and contributing to RMAD | N/A |
| 000723 | 723 | 1229 | P | Lithic scatter (5 flakes) | No | Unknown | N/A |
| 002438/002439 | 2438H/ 2439H | 1143/1148 | M | Precontact obsidian flake scatter. Historic era camp, bridge remains and retaining wall below Rush Meadows Dam. | Yes | Precontact component eligible and contributing to RMAD; historic component not eligible | N/A |
| 002440 | 2440/H | 1144 | M | Precontact obsidian flake scatter, cryptocrystalline silicate debitage, flaked tools, milling equipment, and in situ tephra layer. Historic era cut stumps from construction of the reservoir. | Yes | Precontact component eligible and contributing to RMAD; historic component not eligible | Excavated in 1996 and 1998 and found to contain data potential including important paleo botanical data for eligibility under Criterion D (no SHPO concurrence) |
| 002441 | 2441 | 1145 | P | Obsidian flake scatter, projectile point fragment and in situ tephra layer. | Yes | Eligible and contributing to RMAD | Data potential exhausted through data recovery in 1998, recommended not eligible (no SHPO concurrence) |
| 002442 | 2442 | 1147 | P | Obsidian flake scatter and flaked tools. | Yes | Eligible and contributing to RMAD | Data potential exhausted through data recovery in 1998, recommended not eligible (no OHP concurrence) |
| 002443 | 2443/H | 1148 | M | Newly identified precontact milling feature and handstone. Historic era footbridge. | No | Not eligible | N/A |
| 002458 | 2458 | 1173 | P | Obsidian flake scatter, projectile point fragment and granite handstone. | Yes | Eligible | Excavated in 1998 and found to contain data potential including important paleo botanical data for eligibility under Criterion D (no OHP concurrence) |
| 002459 | 2459 | 1174 | P | Obsidian scatter and biface fragment. | Yes | Eligible | Data potential exhausted through data recovery in 1996, recommended not eligible (no OHP concurrence) |
| 002460 | 2460 | 1175 | P | Obsidian scatter and flaked tools. | Yes | Eligible | Excavated in 1996 and found to contain data potential including important paleo botanical data for eligibility under Criterion D (no OHP concurrence) |
| 002461 | 2461/H | 1176 | M | Precontact obsidian scatter and projectile point fragments. Historic era ceramic tableware sherds and stacked rock. | Yes | Eligible | Data potential exhausted through data recovery in 1996, recommended not eligible (no OHP concurrence) |
| 002463 | 2463 | 1172 | P | Obsidian scatter, projectile point, and projectile point fragments. | Yes | Eligible | Data potential exhausted through data recovery in 1996, recommended not eligible (no OHP concurrence) |
| 003092 | 3037 | 1258 | H | Baker Cabin | No | Unevaluated | N/A |
| 004619 | unknown | 1464 | H | Historic arbor glyph | No | Unevaluated | N/A |
| 004696 | 4157H | 1684 | H | Trash scatter: cans, glass, tram railings, and ceramic tableware. | No | Not eligible; OHP concurrence 02/08/11 | N/A |
| 004697 | 4158H | 1685 | H | Historic-era trash scatter: glass, cans, and metal fragments | No | Not eligible; OHP concurrence 02/08/11 | N/A |

Notes:
1. Site Types: Precontact (P), Historic era (H), Multicomponent (M)
2. Jackson 1997; 1999; Jackson and Morgan 1999
Key: OHP = Office of Historic Preservation

# MAPS




Rush Creek Project (FERC 1389)

**Map 8.12-1**

**Cultural Resources Area of Potential Effects and Study Area**

0 0.25 0.5 Miles

**Date: 7/15/2024**

**Projection: UTM Zone 11**
**Datum: NAD 83**



C:\GIS\237800343\map\Rush Creek\CulturalMaps\SCE_RUSH_CREEK_CUL2_TSP_APE_SA_17i11i_03.mxd

## TABLE OF CONTENTS

Page

8.13 Tribal Resources ........ 8.13-1
8.13.1 Overview ........ 8.13-1
8.13.2 Area of Potential Effects and Study Area ........ 8.13-1
8.13.3 Information Sources ........ 8.13-2
8.13.4 Physical Environment and Climate and Cultural Contexts ........ 8.13-6
8.13.5 Indian Tribes ........ 8.13-6
8.13.6 Tribal Lands ........ 8.13-9
8.13.7 Tribal Resources and Interests ........ 8.13-9
8.13.8 Traditional Cultural Properties ........ 8.13-9
8.13.9 References ........ 8.13-10

## LIST OF FIGURES

Map 8.13-1. Study Area, Land Ownership and Watershed Map ........ 8.13-17

Map 8.13-2. Tribal Resources Area of Potential Effects ........ 8.13-18

## LIST OF ACRONYMS

| | |
|---|---|
| APE | area of potential effects |
| BIA | United States Bureau of Indian Affairs |
| CFR | Code of Federal Regulations |
| FERC | Federal Energy Regulatory Commission |
| Forest Service | United States Forest Service |
| GLO | General Land Office |
| INF | Inyo National Forest |
| NAHC | Native American Heritage Commission |
| NPS | National Park Service |
| NRHP | National Register of Historic Places |
| OHP | California Office of Historic Preservation |
| Project | Rush Creek Project |
| SCE | Southern California Edison Company |
| SHPO | State Historic Preservation Officer |
| TCP | Traditional Cultural Properties |
| Tribes | Tribal Resources and American Indian Tribes |
| TSP | Technical Study Plan |
| TSR | Technical Study Report |
| TWG | Technical Working Group |
| UC | University of California |

## 8.13 TRIBAL RESOURCES

This section describes Tribal Resources and American Indian Tribes (Tribes) known to have cultural interest in the vicinity of Southern California Edison Company's (SCE) Rush Creek Project (Project). This section identifies 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 Federal Energy Regulatory Commission (FERC) Project boundary, and identifies tribal cultural or economic interests, including Traditional Cultural Properties (TCP) that may be affected by Proposed Action and existing Project operation or maintenance activities.

Preliminary information regarding implementation of the TRI 1 – Tribal Resources Technical Study Plan (TSP) is presented in the section. The Draft TRI 1 – Tribal Resources Technical Study Report (TSR) (West and Lerch 2024) is being reviewed. More complete information will be provided in the Final License Application.

### 8.13.1 Overview

The Project is in the upper elevations of the Rush Creek watershed, a major tributary of Mono Lake. It is located at the junction of two major geographical and cultural regions: the central Sierra Nevada and the Great Basin (Map 8.13-1[1]). The two regions are known for differences in linguistic and cultural groups, environmental adaptations, and material culture. The Great Basin is more closely affiliated with desert adaptations, whereas the Sierra Nevada is more closely associated with mountain adaptations. The precontact group occupying the Rush Creek area was the Great Basin–affiliated Mono Lake Kutzadika[a] (Kootzaduka'a),[2] who lived in a mountain setting for a portion of the year and in the Great Basin for the remainder of the year. The headwaters for Rush Creek are located just west of the Project and Rush Creek is one of the main tributaries of Mono Lake.

### 8.13.2 Area of Potential Effects and Study Area

A Project's area of potential effects (APE) is defined in Section 106 of the National Historic Preservation Act as "the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist" (36 Code of Federal Regulations [CFR] 800.16[d]). Additionally, the Advisory Council on Historic Preservation and the California Office of Historic Preservation (OHP) have provided guidance for federal agencies and their delegated licensees to consider potential effects that may occur immediately and directly, are reasonably foreseeable or may occur later in time, are farther removed in distance and potentially affected indirectly, and/or include cumulative effects of/related to the

---

[1] SCE's Lee Vining Project (FERC Project No. 1388) is being relicensed concurrently with the Rush Creek Project. Collaboration between the two Tribal Resources Studies is on-going. This map shows the proximity of the Lee Vining Project and Tribal Resources Study Area in relation to the Rush Creek Project and Study Area.

[2] In the TRI 1 – Tribal Resources TSR and in this section, we use the "Kutzadika[a] (Kootzaduka'a)" spelling except in direct quotations and references, in deference to historical usage by the Tribe and its recent petitions for federal Tribal recognition, and in anticipation of its eventual formal name change following a full vote of Tribal membership. When referencing Tribal consultation and citing the Tribe's website, we use "Kootzaduka'a."

undertaking. For the purposes of study implementation, the Project APE is defined as the entire area within the FERC Project boundary (Map 8.13-2).

The APE was discussed during Technical Working Group (TWG) study plan meetings in the spring of 2022, and comments were incorporated into the Revised Study Plans, which were submitted to the FERC in September 2022. SCE submitted the proposed APE, on behalf of FERC, to the State Historic Preservation Officer (SHPO) for comments on the adequacy of the APE pursuant to 36 CFR 800.16[d]) on February 14 and October 20, 2023 (SCE 2023).

On January 5, 2024, SCE received comments from the SHPO (FERC831003A) on the adequacy of the APE. The SHPO requested that a vertical APE be added for all the Project alternatives and agreed that, based on the horizontal APE, the proposed study areas are appropriate given the scope of the undertaking. The SHPO also advised that modification of the APE may be necessary, depending on the results of the built-environment, archaeological, and Tribal resource studies, if resources extended beyond the FERC project boundary (OHP 2024).

### 8.13.3 Information Sources

A literature review and archival research were conducted as part of the TSP implementation to develop the Tribal resources historic context to be used in identification and evaluation of Tribal resources within the APE for National Register of Historic Places (NRHP) eligibility. An initial review of relevant archaeological, ethnographic, and ethnohistorical literature was conducted during preparation of the Pre-Application Document and the TSP. The initial literature review was expanded to include previous regional studies intended to familiarize the researchers with available information. Among the sources of information considered were cultural resource overviews conducted by the Bureau of Land Management for the study area region in California (Busby et al. 1980a) and for adjoining regions in western Nevada (Bengston 2003; Pendleton et al. 1982). Other useful sources included an ethnohistory of Mono County based on extensive use of archival sources prepared for the California Department of Transportation (Davis-King 2010); a study that addressed trans-Sierran trade and trails between Tuolumne Meadows and Mono Basin (Davis-King and Snyder 2010); and previous studies conducted for the National Park Service (NPS) that document family relationships between Mono Lake basin and Yosemite (e.g., Davis-King 1996, 1998), as well as relationships with neighboring groups in Owens Valley to the south (Davis-King 2003) and the western slopes of the Sierra Nevada to the southwest (Davis-King et al. 2010; TCR and ACRS 1984). Also reviewed was a recent ethnographic overview of the Sierra Crest conducted for the NPS, which included many of the consulting Tribes for the current Project (Deur et al. 2018).

The literature review also considered specific local ethnographic and ethnohistoric studies pertinent to the Mono Lake basin and adjoining areas. Among these were ethnographic accounts by C. Hart Merriam based on his early-twentieth-century visits to the area (Merriam 1900, 1901, 1955a, 1955b, 1955c) and ethnobiological data compiled by Merriam during those visits (Merriam 1979a, 1979b, 1979c). Other ethnographic studies that included interviews with local Tribal members were conducted by Julian H. Steward (1933), Emma Lou Davis (1965), Marvin and Costello (1993), and Helen McCarthy (1996), in addition to the many studies cited above by Shelly Davis-King, an ethnographer involved with early phases of the current study. Important information regarding interactions among early explorers, miners, and settlers and local Native peoples is summarized by Fletcher (1987), and data on Tribal land use, government allotments, and other aspects of Mono Lake ethnohistory are provided by Marks (2021, 2023). These sources contributed to the cultural context of the TSR, along with standard references such as publications by Chalfant (1933), Hull (2007), Fowler and Liljeblad (1986), Golla (2011), Laws (2007), Levy (1978), and Moratto (1984).

In addition to studies by ethnographers and historians, Tribal members have contributed to traditional ecological knowledge and have been active in water conservation efforts, contributing oral histories such as versions of the Fish Story on Tribal origins in *Tribal Water Stories 2* (DWR 2018), and in telling their own histories (Frank and Hogelin 2007). One noteworthy example that applies to the Project area is *Voices of the People,* a recent contribution from The Traditionally Associated Tribes of Yosemite National Park (2019).

Archival research was conducted at repositories identified in the TSP to obtain additional information specific to the prehistory, ethnography, and history associated with the study area. All archival research was conducted online using digitized sources. Some archival sources collected and transcribed by Johnson (2024) for the Lee Vining Project (FERC Project No. 1388) and were shared for the Rush Creek TRI 1 – Tribal Resources TSR. The following repositories provided information for the TRI 1 – Tribal Resources TSR:

- **Autry Museum of the American West, Los Angeles:** The Autry Museum contains extensive collections from the Mono Lake region, including more than 500 entries, of which more than half are basketry and other items made of plant materials, most collected before 1920, along with upward of 100 historical photographs, and other items (Autry Museum n.d.). The museum’s catalog of holdings was reviewed online; particularly useful are descriptions of basketry and other artifacts that describe the plants used to fashion each item. This information can be added to ongoing ethnobotanical studies for the area.

- **Emma Lou Davis Archive, Maturango Museum**: The staff at the Emma Lou Davis archive at Maturango Museum in Ridgecrest, California, was contacted by a mutual colleague. The purpose of this contact was to determine whether field notes collected by Davis during her Mono Lake basin work in the 1960s were contained in the archive. Unfortunately, those notes are no longer in existence, having been destroyed when her home in Hollywood burned in the late 1960s (personal communication from Lynn Johnson, Team Environmental, to Michael Lerch/Crystal West 2023).

- **General Land Office (GLO):** Land patents for Paiute allotments in the vicinity of the study area were obtained by searching the Bureau of Land Management's GLO Land Patent Search online database (https://glorecords.blm.gov/ search/default.aspx). Information found in land patent documents includes the name of the patentee, the legal land description of the patented allotment, the amount of acreage patented, and the date the patent was issued.

- **Hulse and Essene (Bancroft Library, University of California (UC) Berkeley, and elsewhere):** The Hulse manuscripts were prepared in 1935 as part of a Works Progress Administration project (Busby et al. 1980b; Davis-King 2003:35–37; Valory 1971). Using the Bancroft Library finder's guide, the list of manuscripts was located on microfilm, cataloged as "BANC FILM 2216: Ethnological Documents of the Department and Museum of Anthropology, University of California, Berkeley, 1875-1958, The Bancroft Library (Originals: CU-23.1)." Some of the Hulse manuscripts have been used in previous studies (e.g., DWR 2018), and are cited with reference to their published versions. Others were reviewed at the Bancroft Library by Lee Vining Project ethnographer Lynn Johnson, who transcribed several interviews and provided copies to the Rush Creek ethnographers.

- **Huntington Library, SCE Records, and Photographs and Negatives, San Marino:** SCE records located at the Huntington Library were reviewed online, particularly those with reference to Native American workers and residents at the Rush Creek Powerhouse. Keyword searches of this archive were made for *Rush Creek*, *Young Charley/Charlie*, and *Tina Charley/Charlie* without success.

- **Merriam (C. Hart) Notes:** See below.

- **UC Davis, C. Hart Merriam Collection:** The Papers of C. Hart Merriam (b. 1855, d. 1942) are located at UC Berkeley's Bancroft Library and his *California Journals* are held by the UC Davis Anthropology Department Museum. The papers at Bancroft Library are well-indexed and cataloged and are available online. Those pertaining to the study area and Mono Lake basin in general were downloaded and reviewed. Many of the materials in the papers that pertain to the Project vicinity were found to have been published almost verbatim by UC Berkeley Press (Merriam 1955a, 1955b, 1955c) and Ballena Press (Merriam 1979a, 1979b, 1979c). Therefore, we have used the published versions for citations in this report, as they are more readily accessible in libraries and other sources for stakeholders.

- The ***California Journals*** held by the UC Davis Anthropology Museum are copies of the originals in the Library of Congress and are in the process of being transcribed by volunteers under the direction of Collections Manager Elizabeth Guerra. We obtained and reviewed two issues of the *California Journal*, which recorded Merriam's trips to Mono Lake basin and Yosemite (Merriam 1900, 1901). We also note that the museum contains the Merriam basketry collection, with notes on dates and locations where he collected them.

- **Harrington (J.P.) Notes:** We are familiar with the 1907–1957 fieldwork and unpublished notes of John Peabody Harrington, a linguist with the Bureau of Ethnology (b. 1884, d. 1961), now held at the National Archives (Smithsonian Institution 2019) and on microfilm at UC Riverside. However, we determined that he had not worked in the Mono Lake basin area (Mills and Brickfield 1986; Walsh 1976).

- **Native American Heritage Commission (NAHC)** Sacred Lands File for the Project, received on November 6, 2020 (NAHC 2020).

- Mono Basin Historical Society, Lee Vining; Mono County (Official Records), Bridgeport; and National Archive and Records Administration, San Bruno: These three archives were not visited by the Rush Creek ethnographers, although information from them that has been presented by previous researchers was reviewed and cited as needed (e.g., Davis-King 2010; McCarthy 1996). However, selected records related to Tribal allotments were obtained and shared by Lynn Johnson, Lee Vining Project ethnographer.

- **Records of the United States Forest Service (Forest Service), Inyo National Forest, Bishop:** Records from the Inyo National Forest (INF) were obtained as part of the initial research for the Pre-Application Document and Tribal Resources TSP and the records search for the CUL 2 – Archaeology TSR, which were reviewed along with the archaeological site records and reports from UC Riverside's Eastern Information Center. The INF also issued an Organic Permit for this study and provided a copy of the Mono Streams Restoration Project report (Gilreath and McCarthy 1996), which contains original ethnographic information (McCarthy 1996).

- **SCE's ArcGIS Online:** database that includes data shared by Forest Service Region 5, as well as data obtained (via subscription) from the California Historical Resources Information System was reviewed.

- **UC Berkeley, Bancroft Library**: The Bancroft Library was visited online by M. Lerch to review and obtain information in the Papers of C. Hart Merriam (see above). The Hulse manuscripts (see above) were reviewed at the Bancroft Library by Lynn Johnson, Lee Vining ethnographer, and selected items were transcribed by her and shared with the Rush Creek Tribal Resources team.

- **UC Berkeley, Jepson Fieldnotes**: The Jepson Fieldnotes by Willis Jepson (b. 1867, d. 1946) are located in the UC Berkeley Herbarium, which also houses the Jepson Herbarium (UC Berkeley 2024) and are incorporated into plant descriptions found in the Jepson eFlora (Jepson Flora Project 2024). Many of these were consulted, along with current information in *The Laws Field Guide to the Sierra Nevada* (Laws 2007), during the preparation of the biological resources data compilation for this report (see Table A-2, Appendix A).

- **University of Nevada, Reno, Special Collections**: The University of Nevada, Reno, Special Collections were consulted extensively during preparation of a previous study on Washoe and Northern Paiute land use and Tribal resources by the co-author of this report (Lerch et al. 2010). These materials were reviewed for information relevant to the current study.

- **Yosemite National Park Research Library, El Portal**: During the 2023 archival research activities, information held at the Yosemite National Park Research Library was reviewed online, although the research library was not open to the public at that time. However, the library's holdings were used extensively during preparation of previous reports (Davis-King 1996, 1998; Davis-King and Snyder 2010), and those documents were reviewed for information relevant to this study.

### 8.13.4 Physical Environment and Climate and Cultural Contexts

Updated information for this section is being reviewed and will be provided in the Final License Application.

### 8.13.5 Indian Tribes

SCE emailed the following Tribal governments and groups (listed in alphabetical order) in early 2022 inviting them to TWG meetings for TSP development. This was followed by an email sent on July 14, 2023, with an invitation to participate in Tribal Resources TSP implementation and an introduction of the Tribal Resources team implementing the study:

- American Indian Council of Mariposa County (Southern Sierra Miwuk Nation);
- Big Pine Paiute Tribe of Owens Valley;
- Bishop Paiute Tribe;
- Bridgeport Indian Colony;
- Mono Lake Kootzaduka'a Tribe;
- North Fork Mono Tribe of California;
- North Fork Rancheria of Mono Indians;
- Timbisha Shoshone Tribe;
- Tuolumne Band of Me-Wuk Indians of the Tuolumne Rancheria of California;
- Utu Gwaitu Paiute Tribe of the Benton Paiute Reservation, California;
- Walker River Paiute Tribe;

- Yosemite-Mono Lake Paiute; and
- Washoe Tribe of Nevada and California.

The Antelope Valley Paiute Tribe, Coleville, and Yerington Paiute Tribe of the Yerington Colony and Campbell Ranch were not included because an email address or contact information was not found or an email bounced back.

Responses were received from 10 Tribes (Volume 5, Confidential Cultural and Tribal Resource Information):

- The American Indian Council of Mariposa County (Southern Sierra Miwuk Nation) requested to be kept informed about the Project and advised SCE to work with the Bishop Paiute Tribe and Mono Lake Kutzadika[a] (Kootzaduka'a) Tribe.
- The Bishop Paiute Tribe engaged in discussion and information sharing about the Project. A member of the Tribe participated in the implementation of the Archaeology TSP.
- The Bridgeport Indian Colony expressed interest in participating in the study. The Tribal Resources team requested the form to get on the agenda at the Tribal council meeting but did not hear back and were not able to attend a Tribal council meeting.
- The Mono Lake Kootzaduka'a Tribe engaged in discussion about the Project and provided contacts for the Tribal Resources team. A member of the Tribe participated in the implementation of the Archaeology TSP as well as a field visit to the Rush Creek Powerhouse complex with the Tribal Resources team. On April 29, 2024, a videoconference meeting was held with the Tribal Resources team for both Rush Creek and Lee Vining, SCE, and Tribal leaders to discuss preliminary results of the TSRs and request clarifications on various topics (Mono Lake Kootzaduka'a Tribe 2024b). A meeting was also conducted on June 14, 2024, to discuss the Environmental Justice TSR with Tribal leaders and SCE.
- The North Fork Mono Tribe of California responded to the Tribal Resources team that they did not have additional information but wanted to stay informed.
- The North Fork Rancheria of Mono Indians attended one TWG meeting but did not participate further.
- The Timbisha Shoshone Tribe requested to be kept informed on study results, future TWG meetings, and the Project schedule.

- The Tuolumne Band of Me-Wuk Indians of the Tuolumne Rancheria of California sent a message to the Tribal Resources team during TWG meetings stating that they were interested and knew that they have some affiliation with the area, but that the study area is beyond their traditional territory. They did not participate in the TWGs but wanted to be kept informed.

- The Yosemite-Mono Lake Paiute Indian Community discussed the Project and larger concerns regarding representation of the Yosemite-Mono Lake Paiute Indian Community in Yosemite National Park and the current studies with a Tribal Resources team member. They requested to be kept informed on study results, future TWG meetings, and the Project schedule.

- The Walker River Paiute Tribe declined to participate, stating the study area/Project is outside their traditional places.

The Tribal resources investigation made a good-faith effort at proper communication with Tribal leaders as laid out in FERC's *Policy Statement on Consultation with Indian Tribes in Commission Proceedings*, issued July 23, 2003 (Docket No. PL03-4-000; Order No. 635; FERC 2003). The investigation followed the FERC regulations at 18 CFR § 2.1c; FERC recently revised its policy statement on consultation with Tribes in FERC proceedings (FERC 2019).

#### 8.13.5.1 Interviews and Field Visits

Informal interviews in the form of phone calls and a field visit were conducted with a few participants. The purpose of these was to identify Tribal resources and interests within the APE and study area.

In-person meetups in Mammoth Lakes were attempted in August 2023 with a Mono Lake Kutzadika[a] (Kootzaduka'a) Tribal member (Rhonda Swager), who was identified by the Tribal chair (Charlotte Lange) as having information from elders on the study area. Unfortunately, these meetings were canceled due to weather and other circumstances, and this information is still outstanding.

Representatives of the Bishop Paiute Tribe (Hunter Begay) and Mono Lake Kootzaduka'a Tribe (Dean Tonenna) participated in the archaeological surveys conducted between July and September 2023. Both representatives observed surveys and participated in the identification and recording of archaeological resources within the APE. Additionally, both representatives contributed traditional knowledge that facilitated the identification and recording of archaeological resources.

A representative of the Mono Lake Kootzaduka'a Tribe (Dean Tonenna) visited the Rush Creek Powerhouse with the Tribal Resources team on September 14, 2023. Maps of the Project were shared as well as a preliminary cultural plant list of the study area. The archaeological surveys were discussed, and observations were made regarding trail corridors and biological resources (Tonenna 2023).

A phone call was received from a representative of the Yosemite-Mono Lake Paiute Indian Community (David Andrews) on September 6, 2023. He noted that his family has an allotment on the north side of Mono Lake, near the road to Bodie. Captain John, Mono Lake Paiute Chief, was his great, great grandfather. He expressed interest in a follow-up email or call to discuss Mono Lake Paiute and Yosemite connections and misrepresentation of Mono Lake people in Yosemite. He indicated that he may also have additional information on Young Charlie, who lived and worked at the Rush Creek Powerhouse with Tina and Nellie Charlie. Follow-up emails were sent, with an invitation to schedule an interview during the stakeholder review period. Any pertinent information will be added to the Final TRI 1 – Tribal Resources TSR.

An interview/office visit with Raymond Andrews, a member of Bishop Paiute Tribe who has Kutzadika[a] (Kootzaduka'a) ancestry, was held with Crystal West at the Stantec Bishop office on March 13, 2024, with follow-up visits on March 15 and April 10, 2024 (information from this interview and follow-ups is cited as Andrews 2024). On May 1, 2024, a videoconference meeting was attended by the Tribal Resources team from both the Rush Creek and Lee Vining projects, SCE, and Mr. Andrews to discuss preliminary results of the TSRs and clarify various topics.

Continued consultation and review of the Draft TRI 1 – Tribal Resources TSR with participating Tribes, Forest Service, SHPO and FERC are in progress.

### 8.13.6 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 United States Bureau of Indian Affairs (BIA). Based on review of BIA data sources, archival research and interviews, there are no tribal lands located within or adjacent to the FERC Project boundary (BIA 2020).

### 8.13.7 Tribal Resources and Interests

Tribal resources and interests have been identified within the APE and study area. Continued consultation with participating Tribes, Forest Service, SHPO and FERC is on-going.

### 8.13.8 Traditional Cultural Properties

A TCP is a resource that is eligible for inclusion in the 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 Part 63) to be considered a historic property (defined as a resource listed in or determined eligible for the NRHP).

An NAHC Sacred Lands File conducted for the FERC Project boundary and a 1-mile buffer did not identify any Sacred Lands (NAHC 2020). Any potential TCPs identified by the current study will be reviewed by Tribes associated with the TCP, Forest Service, SHPO and FERC.

### 8.13.9 References


Andrews, Raymond. 2024. Interviews on March 13, March 15, and April 10 by Crystal West, Stantec, with Raymond Andrews, Bishop Paiute Tribe, from Mono Lake for Rush Creek Tribal Resources Report (TRI 1). Interviews conducted at the Stantec Office in Bishop, California.

Autry Museum of the American West. n.d. Search LAA. Electronic database, https://theautry.org/research-collections/library-and-archives/search-laa.

Bengston, Ginny. 2003. *Northern Paiute and Western Shoshone Land Use in Northern Nevada: A Class I Ethnographic/Ethnohistoric Overview.* Cultural Resource Series No. 12. U.S. Department of the Interior, Bureau of Land Management, Nevada State Office, Reno.

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/#.

Busby, Colin, John M. Findlay, and James C. Bard. 1980a. *A Cultural Resource Overview of the Bureau of Land Management Coleville, Bodie, Benton, and Owens Valley Planning Units* (June, 1979). Basin Research Associates, Oakland, California. Bureau of Land Management Cultural Resources Publications, Anthropology–History, Bakersfield, California.

——. 1980b. University of California, Berkeley, Ethnographic Archive Material. Appendix A. In *A Cultural Resource Overview of the Bureau of Land Management* Coleville*, Bodie, Benton, and Owens Valley Planning Units* (June, 1979). Basin Research Associates, Oakland, California. Bureau of Land Management Cultural Resources Publications, Anthropology–History, Bakersfield, California.

Chalfant, W.A. 1933. *The Story of Inyo.* Revised Edition. Chalfant Press, Bishop, California.

Davis, Emma Lou. 1965. *An Ethnography of the Kuzedika Paiute of Mono Lake, Mono County, California.* Miscellaneous Paper 8. Miscellaneous Collected Papers 8–10, Anthropological Papers No. 75. University of Utah, Salt Lake City.

Davis-King, Shelly. 1996. A Mono Paiute Shaman's Burial at Ahwahnee: Artifact Analysis of Materials Associated with Joaquin Sam (Kosano) at CA-MRP-56, from the Yosemite Museum, Yosemite National Park, California. Submitted to National Park Service, Yosemite National Park.

Davis-King, Shelly. 1998. *Johnny Wilson's Place: Investigations at CA-MRP-362/H and CA-MRP-363H within the El Portal Archaeological District, Mariposa County, Yosemite National Park, California*. Prepared for EA Engineering, Science, and Technology, Hunt Valley, Maryland. Submitted to National Park Service, Yosemite National Park, California.

Davis-King, Shelly. 2003. Participants and Observers: Perspectives on Native American Historic Information from Independence to Haiwee Reservoir in Owens Valley, Inyo County, California. Submitted to California Department of Transportation, Fresno.

Davis-King, Shelly. 2010. *Amid the Sagebrush Plain, Atop the Lofty Peaks: Native American History in Mono County, California.* Prepared by Davis-King & Associates for Far Western Anthropological Research Group, Davis, California. Submitted to California Department of Transportation, Bishop, California.

Davis-King, Shelly, Clinton Blount, and Stella D'Oro. 2010. Native American Geography, History, Traditional Resources, Contemporary Communities, and Concerns: Cultural Resources Inventory of Caltrans District 6 Rural Conventional Highways. Prepared by Davis-King & Associates and Albion Environmental for Far Western Anthropological Research Group, Davis, California. Submitted to California Department of Transportation, Fresno, California.

Davis-King, S. and J.B. Snyder. 2010. The Silver Thread-Upper Tuolumne River American Indian Land Use in Yosemite National Park: Ethnographic Context for the Tuolumne Wilde and Scenic River Comprehensive Management Plan and Environmental Impact Statement, Tuolumne County, California. Submitted to USDI, National Park Service, Yosemite National Park, California.

Deur, Douglas, Charles Ettner, and Rochelle Blooom. 2018. Homelands of the Sierra Crest: An Ethnographic Overview and Assessment Relating to Tribes Associated with Sequoia-Kings Canyon National Parks and Devils Postpile National Monument. Office of Applied Anthropological Research. Department of Anthropology, Portland State University, Portland, Oregon. Prepared for Pacific West Region, National Park Service, San Francisco, California.

DWR (California Department of Water Resources). 2018. *Tribal Water Stories 2,* Carole Rains, ed. Department of Water Resources, Sacramento, California. Electronic document, https://water.ca.gov/-/media/DWR-Website/Web-Pages/About/Tribal/Files/Tribal-Stories-2.pdf, accessed April 9, 2024.

FERC (Federal Energy Regulatory Commission). 2003. *Policy Statement on Consultation with Indian Tribes in Commission Proceedings*. Issued July 23, 2003, Docket No. PL03-4-000; Order No. 635.

——. 2019. *Revision to Policy Statement on Consultation with Indian Tribes in Commission Proceedings, 18 CFR 2 (October 10, 2019).*

Fletcher, Thomas C. 1987. *Paiute, Prospector, Pioneer: A History of the Bodie-Mono Lake Area in the Nineteenth Century*. Artemisia Press, Lee Vining, California.

Fowler, Catherine S., and Sven Liljeblad. 1986. Owens Valley Paiute. In *Great Basin,* edited by Warren L. d'Azevedo, pp. 412–43. Handbook of North American Indians Vol. 11, William C. Sturtevant, general editor. Smithsonian Institution, Washington, D.C.

Frank, L., and Kim Hogelin. 2007. Great Basin. In *First Families: A Photographic History of California Indians,* pp. 179–205. Heyday Books, Berkeley, California.

Gilreath, Amy J., and Helen McCarthy. 1996. *Cultural Resources Inventory of Four Tributaries to Mono Lake, and an Evaluation Plan for the Mono Streams Restoration Project.* ARR #05-04-679. Far Western Anthropological Research Group, Davis, California. Prepared on behalf of Los Angeles Department of Water and Power, Los Angeles, California, for California Water Resources Control Board and Inyo National Forest, Bishop, California.

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

Hull, Kathleen L. 2007. The Sierra Nevada: Archaeology in the Range of Light. In *California Prehistory: Colonization, Culture, and Complexity,* edited by Terry L. Jones and Kathryn A. Klar, pp. 177–190. Altamira Press, Lanham, Maryland.

Jepson Flora Project. 2024. Jepson eFlora*.* Electronic document, https://ucjeps.berkeley.edu/eflora/, accessed February 27, 2024.

Johnson, Lynn. 2024. *Tribal Resources Technical Study Report, Lee Vining FERC Project No. 1388*. Team Environmental, Bishop. Submitted to Far Western Anthropological Research Group and Southern California Edison Company, Rosemead, California.

Laws, John Muir. 2007. *The Laws Field Guide to the Sierra Nevada.* California Academy of Sciences and Heyday Books, Berkeley, California.

Lerch et al. 2010. *The People and Places of Truckee Meadows: An Ethnohistory of a Portion of the Truckee Meadows Flood Control Project, Washoe County, Nevada*. Submitted to U.S. Army Corps of Engineers, Sacramento, California. Technical Report 09-10. Statistical Research, Woodland, 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.

Marks, Robert B. 2021. Sheep Replace Pronghorn: An Environmental History of the Mono Basin. *Eastern Sierra History Journal* 2(3):1–37. Electronic document, https://scholarship.claremont.edu/eshj/vol4/iss1/1, accessed December 3, 2023.

Marks, Robert B. 2023. Dispossessed Again: Paiute Land Allotments in the Mono Basin, 1907–1929. *Eastern Sierra History Journal* 4(1):1–30. Electronic document, https://scholarship.claremont.edu/eshj/vol2/iss1/3, accessed December 3, 2023.

Marvin, Judith, and Julia Costello. 1993. Supplemental Archaeological Survey Report and Historic Study Report for Rush Creek 4-Lane Project Near Lee Vining, Mono County, California. Foothill Resources, Ltd. On file, Caltrans District 9, Bishop.

McCarthy, Helen. 1996. "Ethnographic Background" and "Ethnographic Interviews and Results." In *Cultural Resources Inventory of Four Tributaries to Mono Lake, and an Evaluation Plan for the Mono Streams Restoration Project*, by Amy J. Gilreath and Helen McCarthy, pp. 21–28, 71–73, 88–93. ARR #05-04-679. Far Western Anthropological Research Group, Davis, California. Prepared on behalf of Los Angeles Department of Water and Power, Los Angeles, California, for California Water Resources Control Board and Inyo National Forest, Bishop, California.

Merriam, C. Hart. 1900. *California Journal.* Volume 1, No. 1. Manuscript on file, Department of Anthropology Museum, University of California, Davis.

Merriam, C. Hart. 1901. *California Journal.* Volume 2, No. 1. Manuscript on file, Department of Anthropology Museum, University of California, Davis.

Merriam, C. Hart. 1955a. *Studies of California Indians,* edited by the Department of Anthropology, University of California. University of California Press, Berkeley.

Merriam, C. Hart. 1955b. The Mono Paiute. In *Studies of California Indians,* edited by the Department of Anthropology, University of California, pp. 71–76. University of California Press, Berkeley.

Merriam, C. Hart. 1955c. Shoshonean Tribal Names. In *Studies of California Indians,* edited by the Department of Anthropology, University of California, pp. 149–174. University of California Press, Berkeley.

Merriam, C. Hart. 1979a. *Indian Names for Plants and Animals among Californian and other Western North American Tribes*. Assembled and annotated by Robert F. Heizer. Ballena Press, Socorro, New Mexico.

Merriam, C. Hart. 1979b. Field Check List Schedule 92, Mono Paiute (Koo-tsab'-be-dik-ka-kuddy) [recorded at Mono Lake; August 1903, October 193, May 1935, June 1937, July 1938]. In *Indian Names for Plants and Animals among Californian and other Western North American Tribes.* Assembled and annotated by Robert F. Heizer, pp. 163–165, 259–260. Ballena Press, Socorro, New Mexico.

Merriam, C. Hart. 1979c. Field Check List Schedule 99, Bridgeport Paiute [recorded at Bridgeport; October 5–6, 1934, August 1938]. In *Indian Names for Plants and Animals among Californian and other Western North American Tribes,* assembled and annotated by Robert F. Heizer, pp. 176–178, 263. Ballena Press, Socorro, New Mexico.

Mills, Elaine L., and Ann Brickfield. 1986. *The Papers of John Peabody Harrington in the Smithsonian Institution, 1907–1957, Volume Three, A Guide to the Field Notes: Native American History, Language and Culture of Southern California/Basin.* Kraus International Publications, White Plains, New York.

Mono Lake Kootzaduka'a Tribe. 2024b. Teleconference meeting with Charlotte Lange and Dean Tonenna, Mono Lake Kutzadikaa (Kootzaduka'a) Tribe, Rush Creek and Lee Vining ethnographers (C. West, M. Lerch, and L. Johnson), and SCE (A. Williams). Notes, May 29, 2024. On file, Stantec, Bishop, California.

Moratto, Michael J. 1984. California *Archaeology.* Academic Press, New York.

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

OHP (Office of Historic Preservation). 2004. Letter from SHPO to SCE Principal Manager, re: Section 106 Consultation: Proposed Area of Potential Affect for Southern California Edison's Rush Creek Hydroelectric Project Relicensing FERC Project No. 1389, Mono County, California, January 5, 2024. Office of Historic Preservation, Sacramento, California

Pendleton, Lorann S.A., Alvin R. McLane, and David Hurst Thomas. 1982. *Cultural Resource Overview, Carson City District, West Central Nevada, Parts 1 and 2.* Cultural Resource Series No. 5, Bureau of Land Management, Nevada.

SCE (Southern California Edison Company). 2023. Letter from SCE Principal Manager to SHPO, re: Section 106 Consultation: Proposed Area of Potential Effects for the Southern California Edison (SCE) Rush Creek Project Cultural and Tribal Relicensing Studies (CUL 1, CUL 2, TRI 1), FERC Project No. 1389, February 14, 2023. Southern California Edison Company, Rosemead, California.

Smithsonian Institution. 2019. Papers of John Peabody Harrington, 1907–1957. Electronic document, https://www.archives.gov/nhprc/projects/catalog/john-peabody-harrington.

Steward, Julian H. 1933. Ethnography of the Owens Valley Paiute. *University of California Publications in American Archaeology and Ethnology* 34(5):355–440. Berkeley.

TCR and ACRS. 1984. Cultural Resources Overview of the Southern Sierra Nevada: An Ethnographic, Linguistic, Archaeological, and Historical Study of the Sierra National Forest, Sequoia National Forest, and Bakersfield District of the Bureau of Land Management. Theodoratus Cultural Research, Fair Oaks, California, and Archaeological Consulting and Research Services, Santa Cruz, California. Submitted to U.S. Forest Service, Bishop, California.

Tonenna, Dean. 2023. Field trip to Rush Creek Powerhouse and Lee Vining Powerhouse with Dean Tonenna, Crystal West, Michael Lerch, and Lynn Johnson. Notes, September 14, 2023. On file, Stantec, Bishop, California.

Traditionally Associated Tribes of Yosemite National Park. 2019. *Voices of the People.* National Park Service, Yosemite National Park.

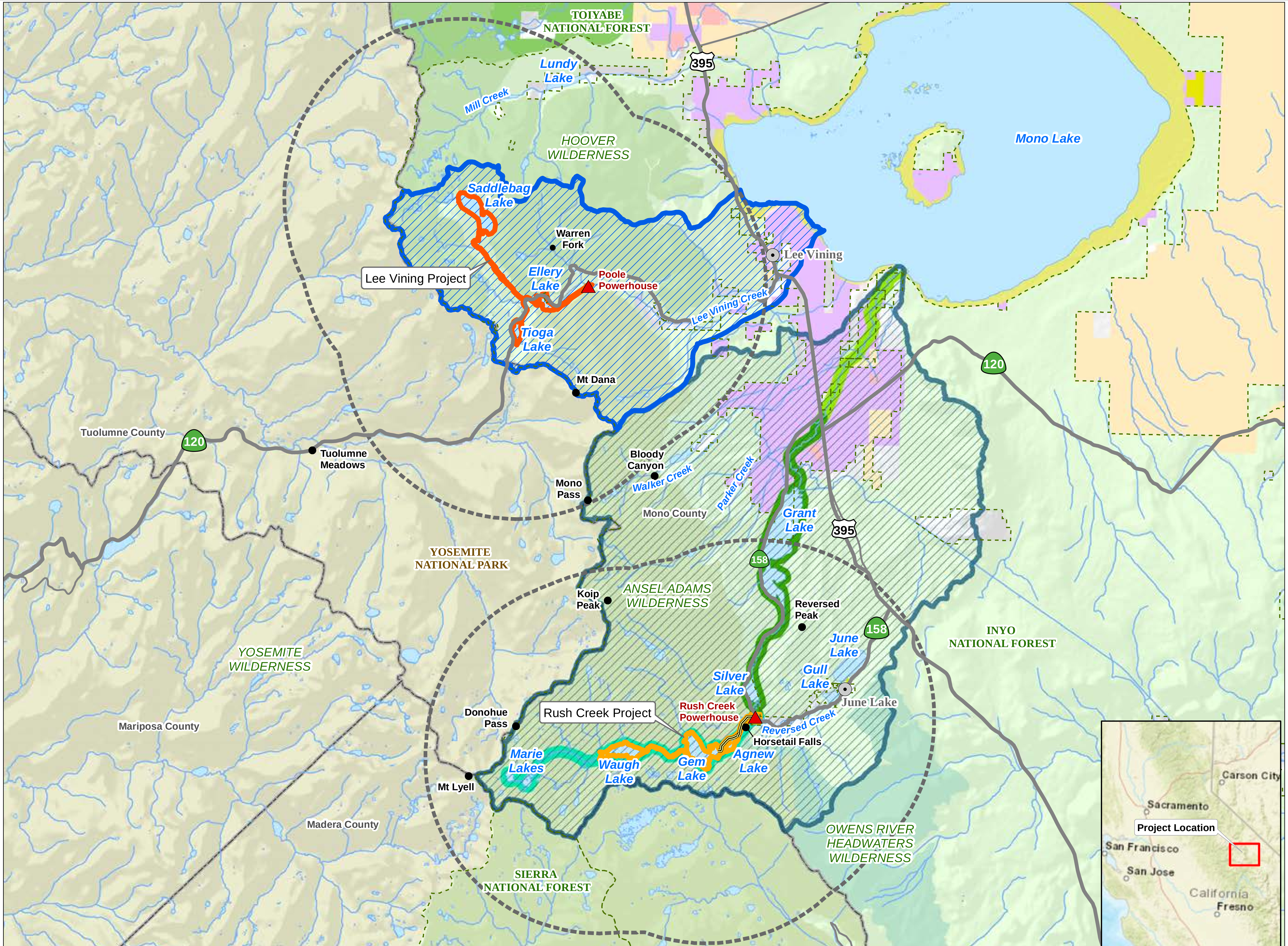
U.C. Berkeley. 2024. The University and Jepson Herbaria. Jepson Field Books. Electronic document, https://ucjeps.berkeley.edu/images/fieldbooks/jepson_fieldbooks.html.

Valory, Dale. 1971. *Guide to the Ethnological Documents (1–203) of the Department and Museum of Anthropology, University of California, Berkeley.* Manuscript on file in the University Archives. Non-serial publication of the Archaeological Research Facility, University of California, Berkeley.

Walsh, Jane MacLaren. 1976. *John Peabody Harrington: The Man and His California Indian Fieldnotes, with a Foreword by Lowell John Bean*. Ballena Press, Ramona, California.

West and Lerch. 2024. Draft TRI 1 – Tribal Resources Technical Study Report. To be provided in the Final License Application.

# MAPS




**SCE Facilities**
- Powerhouse
- Rush Creek (FERC Project No.1389)
- Lee Vining (FERC Project No.1388)

**Other Features**
- Landmark
- City/Town
- Highway
- County Boundary

**Hydrology**
- River/Stream
- Lake
- Lee Vining Watershed
- Rush Creek Watershed

**Rush Creek Segments**
- Lower Rush Creek
- Upper Rush Creek
- Headwaters Rush Creek

**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.

**Cultural Data**
- Tribal Resources Study Area

SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead℠

Rush Creek Project (FERC 1389)

**Map 8.13-1**

**Study Area, Landownership and Watershed Map**

N S W E

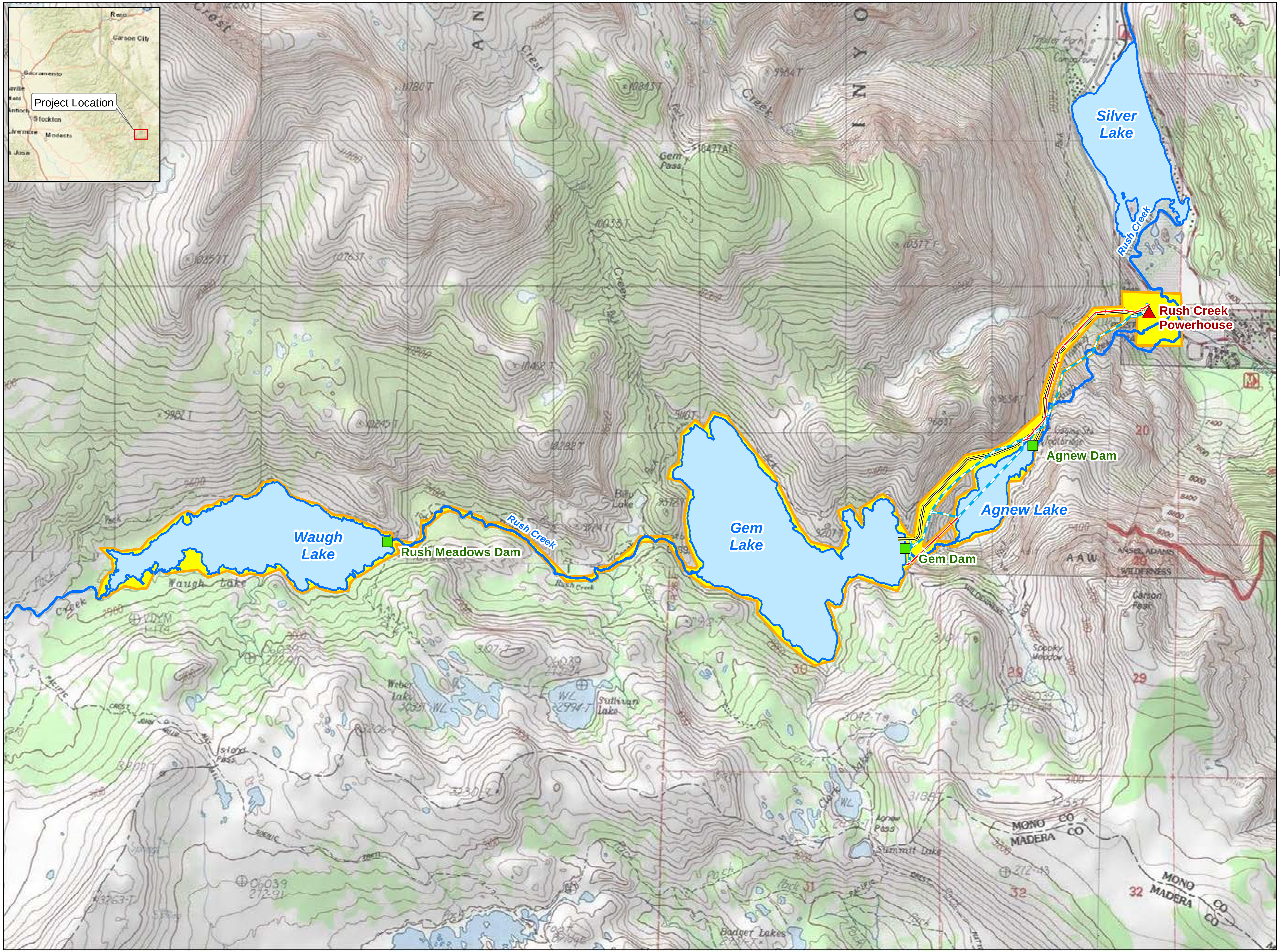
0 0.75 1.5 3 Miles

Date: 7/17/2024

**Projection: UTM Zone 11**
**Datum: NAD 83**



C:\Users\aclare\OneDrive - Stantec\Documents_CON01Data\gis_projects\2378003433\03_data\gis_cad\map\Rush Creek\CulturalMaps\Map8_13_1_StudyAreas_LandOwn_WtrSheds17i11i_04.mxd




**SCE Facilities**

- Powerhouse
- Dam
- Flowline / Penstock
- Power or Communication Line
- Tramway
- FERC Project Boundary

**Other Features**

- Rush Creek
- Lake

**Cultural Data**

- Area of Potential Effects (APE)

SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead℠

Rush Creek Project (FERC 1389)

**Map 8.13-2**

**Tribal Resources Area of Potential Effects**

0 0.25 0.5 Miles

Date: 7/15/2024

**Projection: UTM Zone 11**
**Datum: NAD 83**



C:\GIS\237800343\map\Rush Creek\CulturalMaps\SCE_RUSH_CREEK_TRI1_TSP_APE_17i11i_02.mxd

## TABLE OF CONTENTS

Page

8.14 Socioeconomics ....... 8.14-1
8.14.1 Information Sources ....... 8.14-1
8.14.2 General Land Use Patterns ....... 8.14-1
8.14.3 Population Characteristics ....... 8.14-2
8.14.4 Household / Family Distribution and Income ....... 8.14-3
8.14.5 Environmental Justice ....... 8.14-4
8.14.6 Employment ....... 8.14-5
8.14.7 References ....... 8.14-5

## LIST OF TABLES

Table 8.14-1. Mono County Total Population and Median Age (2020) ....... 8.14-8
Table 8.14-2. Estimated and Projected Population for Mono County ....... 8.14-8
Table 8.14-3. Mono County Total Population by Race (2020) ....... 8.14-9
Table 8.14-4. Mono County Projected Population by Race/Ethnicity ....... 8.14-10
Table 8.14-5. Household Characteristics (2022) ....... 8.14-10
Table 8.14-6. Major Employers in Mono County ....... 8.14-11

## LIST OF ACRONYMS

| | |
|---|---|
| ACS | American Community Survey |
| 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 |

## 8.14 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 following sections summarize socioeconomic conditions, including social and economic conditions, general land use patterns, population patterns, and sources of employment in the vicinity of the Project. Refer to Section 8.9, Land Use for more information regarding the land use in the vicinity of the Project.

### 8.14.1 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 2024a, 2024b);
- 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 2020a, 2022a);
- United States Bureau of Economic Analysis (BEA) data on personal income and industry earnings (BEA 2019); and
- Draft EJ 1 – Environmental Justice Technical Study Report (SCE 2024).

### 8.14.2 General Land Use Patterns

The Project is located on Rush Creek on the eastern slope of the Sierra Nevada in Mono County, California (Map 4-1). 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 percent 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 the County remains open space.

The area around the Rush Creek Powerhouse is located on SCE-owned lands. However, most 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 Federal Energy Regulatory Commission (FERC) Project boundary includes hydropower generation and dispersed recreation.

Land located adjacent to the FERC Project boundary consists of private land managed by the 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 the 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 the 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).

### 8.14.3 Population Characteristics

The most recent complete census data is from 2020 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 15 CDPs. 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 County population as of the 2020 census totaled 13,195 residents, a majority of which (54 percent or 7,191) resided in the Town of Mammoth Lakes. The unincorporated communities with the highest 2020 population included Crowley Lake (980 residents), Walker (704 residents), Chalfant (660 residents), June Lake (611 residents), and Bridgeport (553 residents). The communities with the lowest population included McGee Creek (45 residents), Aspen Springs (70 residents), and Sunny Slopes (139 residents) (USCB 2020a). Table 8.14-1 provides a summary of population within the County.

In 2020, the unincorporated County had a median age of 53.1 years, which was substantially higher than the Town of Mammoth Lakes median of 35.6 years. The unincorporated communities with the highest 2020 median age included Sunny Slopes (64 years), Aspen Springs (65 years), June Lake (66.5 years), and Walker (67.2 years). The communities with the lowest median age included Coleville (31.1 years), Crowley Lake (32.1 years), and Topaz (32.7 years) (USCB 2020a). Table 8.14-1 provides a summary of median age within the County.

To illustrate trends in population, Table 8.14-2 lists population for 2020 through 2060 as reported in the 2020 census and in population projections developed by the California DOF. Population growth in the unincorporated areas of the 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 2020 was largely white (65.7 percent). Most of the remaining County population (26.5 percent) identified themselves as Hispanic or Latino (USCB 2020a) (Table 8.15-3). The California Department of Finance projects that the Hispanic population in the County will remain consistent at approximately 27.2 percent of total population over the next forty years (DOF 2024a) (Table 8.15-4).

The unincorporated community of June Lake, the closest community to the Project, had a total population of 611 residents per the decennial census in 2020, which makes up 4.6 percent of the countywide population. Of those residents, 78.7 percent were white and 16.6 percent Hispanic. The median age in the community in 2020 was 66.5 years (USCB 2020a).

### 8.14.4 Household / Family Distribution and Income

The 2022 American Community Survey reported the total number of households in the County to be 5,473 (Mammoth Lakes with 3,101 and the unincorporated area of the County with 2,372). Countywide the average household size decreased from 2.75 in 2012 to 2.33 in 2022. Lee Vining had the highest average household size, with 3.99 persons per household. The lowest average household sizes were reported in Paradise and Walker with 1.73 and 2.01 persons per household, respectively (USCB 2022a) (Table 8.14-5).

The overall number of renters in the unincorporated County decreased from 40 percent of all occupied units in 1990 to 32 percent 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 percent in 2010 to 48.2 percent in 2016. The 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).

According to USCB's American Community Survey (ACS), the countywide household median income was $82,038 in 2022, which increased from $61,868 in 2012 (USCB 2022a). However, the median household income varies significantly throughout the County. The unincorporated community of Sunny Slopes has the highest median income of $250,000+ while the unincorporated community of Coleville has the lowest median income at $42,071. The unincorporated community of June Lake has a median income of $108,239 (USCB 2020a). ACS also estimates that 11.3 percent of all people in the County have an income in the past 12 months that is below the poverty level (USCB 2022a).

### 8.14.5 Environmental Justice

Environmental justice is defined as the fair treatment and meaningful involvement of all people, regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies (FERC 2023). One way to determine environmental justice communities is based on the presence of minority populations. If the total percent of a minority population of any census block group in the affected area either exceeds 50 percent or is meaningfully greater than the minority population present in the County, then that area may be considered an environmental justice community (EPA 2016). The total minority population for the block group contiguous with the June Lake CDP (Census Tract 1.01, Block Group 2) is 7 percent based on 2022 ACS 5-year Estimates (Table #B03002) (USCB 2022b).[1] The total minority population for the County is 36 percent. Therefore, the June Lake CDP does not qualify as an environmental justice community based on the presence of minority populations—the total minority population does not exceed 50 percent, nor is the minority population meaningfully greater than the population present in the County.

Another way to determine environmental justice communities is based on the presence of low-income populations and, specifically, by determining whether the poverty level in the identified census block group is equal to or greater than that of a reference population – commonly the County (EPA 2016). Based on 2022 ACS 5-year Estimates (Table #B17017) 13 of the 141 households in the June Lake CDP qualify as below the USCB's poverty level, making the percentage of the population living in poverty in the June Lake CDP equivalent to the percentage of the population living in poverty in the County (9 percent) (USCB 2022b). However, the percentage of the population living in poverty in the County is less than the percentage of the population living in poverty in the state (a larger reference population), and neither the County nor the June Lake CDP are identified as a disadvantaged or low-income community by multiple state agencies. For these reasons, the June Lake CDP has not been identified as an environmental justice community by SCE (SCE 2024). Refer to the Draft EJ 1 – Environmental Justice Technical Study Report (SCE 2024) for a description of the racial, ethnic, and poverty statistics for the County, and for the relevant census tract (Census Tract 1.01, Mono County), and block group (Census Tract 1.01, Block Group 2/June Lake CDP).

[1] Less than the minority population of the June Lake CDP recorded during the 2020 decennial census.

### 8.14.6 Employment

Data from the EDD for the Eastern Sierra-Mother Lode Region indicate that the 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 the 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 percent of all employment is directly associated with this industry. Typically, more than 1.5 million visitors stay in the 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 in the Town of Mammoth Lakes, town of June Lake, and town of Bridgeport. The list of major employers within the County as of 2020 are found in Table 8.15-6. The major employers located within the unincorporated community of June Lake include the Double Eagle Resort and the June Mountain Ski Area (ALMIS 2021).

### 8.14.7 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). 2024a. Demographic Research Unit. Report P-2D: Population Projections by Total Hispanic and Non-Hispanic Race, California Counties, 2020-2060 (Baseline 2019 Population Projections; Vintage 2023 Release). Sacramento: California. March 2024.

———. 2024b. Demographic Research Unit. Report P-2A: Total Population Projections, California Counties, 2020-2060 (Baseline 2019 Population Projections; Vintage 2023 Release). Sacramento: California. March 2024.

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.

EPA (United States Environmental Protection Agency). 2016. Promising Practices for EJ Methodologies in NEPA Reviews. Report of the Federal Interagency Working Group on Environmental Justice and NEPA Committee. Available at: https://www.epa.gov/sites/default/files/2016-08/documents/nepa_promising_practices_document_2016.pdf.

FERC (Federal Energy Regulatory Commission). 2023. Environmental Justice. Available at: https://www.ferc.gov/EJ/. Accessed February 2023.

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/.

SCE (Southern California Edison Company). 2024. Draft EJ 1 – Environmental Justice Technical Study Report. August. Available in Supporting Document A of the Application for New License.

USCB (United States Census Bureau). 2020a. 2020 Decennial Census. U.S. Census Bureau 2020. Available at: www.census.gov.

———. 2020b. American Community Survey, 5-Year Data Profiles (2016-2020) for Mono County. Available at: https://www.census.gov/acs/www/data/data-tables-and-tools/data-profiles/.

———. 2022a. American Community Survey, 5-Year Data Profiles (2018-2022) for Mono County. Available at: https://www.census.gov/acs/www/data/data-tables-and-tools/data-profiles/.

———. 2022b. Data and Mapping Tool. American Community Survey (ACS) 5-Year Estimates Detailed Tables (Table #B03002 and Table #B17017). Available at: https://data.census.gov.

# TABLES

## Table 8.14-1. Mono County Total Population and Median Age (2020)

| | Total Population (2020) | Median Age (years) |
|---|---|---|
| Countywide | 13,195 | 39.5 |
| Mammoth Lakes | 7,191 | 35.6 |
| Unincorporated County | 6,004 | 54.2 |
| County Inside CDPs | 5,403 | – |
| County Outside CDPs | 601 | – |
| Mono County CDPs Detail | | |
| Aspen Springs | 70 | 65 |
| Benton | 279 | 49.5 |
| Bridgeport | 553 | 55.4 |
| Chalfant | 660 | 40.5 |
| Coleville | 419 | 31.1 |
| Crowley Lake | 980 | 32.1 |
| June Lake | 611 | 66.5 |
| Lee Vining | 217 | 53.1 |
| McGee Creek | 45 | --- |
| Mono City | 224 | 38.2 |
| Paradise | 174 | 56.3 |
| Sunny Slopes | 139 | 64 |
| Swall Meadows | 178 | 59.3 |
| Topaz | 150 | 32.7 |
| Walker | 704 | 67.2 |

*Source: USCB 2020a, 2020b*

## Table 8.14-2. Estimated and Projected Population for Mono County

| Year | Population |
|---|---|
| 2020 | 13,195 |
| 2030 | 12,987 |
| 2040 | 12,068 |
| 2050 | 10,881 |
| 2060 | 9,677 |

*Source: USCB 2020a, DOF 2024b*

## Table 8.14-3. Mono County Total Population by Race (2020)

| | Total Population | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | White | Hispanic | American Indian | Asian | Black | Pacific Islander | Other | 2 or More Races |
| Countywide | 8,679 | 3,507 | 177 | 159 | 68 | 26 | 78 | 501 |
| Mammoth Lakes | 4,349 | 2,395 | 6 | 102 | 30 | 10 | 39 | 260 |
| Unincorporated County | 4,330 | 1,112 | 171 | 57 | 38 | 16 | 39 | 241 |
| County Inside CDPs | 3,914 | 996 | 162 | 51 | 22 | 12 | 35 | 212 |
| County Outside CDPs | 416 | 116 | 9 | 6 | 16 | 4 | 4 | 29 |
| **Mono County CDPs Detail** | | | | | | | | |
| Aspen Springs | 65 | 3 | 0 | 0 | 0 | 0 | 1 | 1 |
| Benton | 191 | 37 | 24 | 1 | 1 | 1 | 6 | 18 |
| Bridgeport | 322 | 171 | 22 | 6 | 4 | 1 | 3 | 24 |
| Chalfant | 543 | 55 | 23 | 4 | 2 | 1 | 1 | 31 |
| Coleville | 279 | 104 | 17 | 9 | 6 | 0 | 0 | 5 |
| Crowley Lake | 714 | 182 | 4 | 12 | 5 | 4 | 9 | 50 |
| June Lake | 481 | 102 | 3 | 10 | 0 | 2 | 5 | 8 |
| Lee Vining | 90 | 109 | 12 | 0 | 2 | 0 | 1 | 3 |
| McGee Creek | 30 | 6 | 1 | 1 | 0 | 0 | 0 | 7 |
| Mono City | 171 | 45 | 0 | 0 | 0 | 0 | 5 | 3 |
| Paradise | 138 | 15 | 4 | 2 | 0 | 0 | 1 | 14 |
| Sunny Slopes | 114 | 12 | 5 | 0 | 0 | 2 | 1 | 5 |
| Swall Meadows | 149 | 12 | 2 | 3 | 0 | 1 | 0 | 11 |
| Topaz | 87 | 46 | 5 | 0 | 1 | 0 | 0 | 11 |
| Walker | 540 | 97 | 40 | 3 | 1 | 0 | 2 | 21 |

*Source: USCB 2020a*

## Table 8.14-4. Mono County Projected Population by Race/Ethnicity

| Race/Ethnicity | 2024 | 2030 | 2040 | 2050 | 2060 |
|---|---|---|---|---|---|
| White | 8,604 | 8,472 | 7,887 | 7,117 | 6,310 |
| Black | 103 | 108 | 112 | 73 | 64 |
| American Indian or Alaska Native | 247 | 252 | 241 | 234 | 205 |
| Asian | 313 | 305 | 258 | 238 | 224 |
| Native Hawaiian or Pacific Islander | 44 | 40 | 40 | 35 | 30 |
| Multi-racial | 274 | 271 | 240 | 222 | 205 |
| Hispanic (any race) | 3,597 | 3,539 | 3,290 | 2,962 | 2,639 |
| **Total Projected Population** | **13,182** | **12,987** | **12,068** | **10,881** | **9,677** |

*Source: DOF 2024a*

## Table 8.14-5. Household Characteristics (2022)

| | Average Household Size | Average Family Size | Total Households |
|---|---|---|---|
| Countywide | 2.33 | 2.89 | 5,473 |
| Mammoth Lakes | 2.27 | 3.19 | 3,101 |
| Unincorporated County (Total) | 2.47 | 2.64 | 2,372 |
| **Mono County CDPs Detail** | | | |
| Aspen Springs | 2.43 | 1.88 | 83 |
| Benton | 2.28 | 2.45 | 172 |
| Bridgeport | 2.26 | 3.08 | 168 |
| Chalfant | 2.85 | 3.15 | 212 |
| Coleville | 3.08 | 3.30 | 126 |
| Crowley Lake | 2.39 | 2.56 | 438 |
| June Lake | 2.14 | 2.02 | 141 |
| Lee Vining | 3.99 | 3.99 | 149 |
| McGee Creek | --- | --- | --- |
| Mono City | 2.28 | 2.28 | 98 |
| Paradise | 1.73 | 2.21 | 106 |
| Sunny Slopes | 2.44 | 2.44 | 27 |
| Swall Meadows | 2.25 | 2.31 | 162 |
| Topaz | 2.57 | 3.02 | 63 |
| Walker | 2.01 | 2.34 | 229 |

*Source: USCB 2022a*

## Table 8.14-6. 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*

## TABLE OF CONTENTS

Page

8.15 Air Quality Affected Environment ........ 8.15-1
8.15.1 Information Sources ........ 8.15-1
8.15.2 Regulatory Setting – Air Quality Statutes and Programs ........ 8.15-1
8.15.3 Regulatory Setting – Greenhouse Gas Statutes and Programs ........ 8.15-3
8.15.4 Project Area ........ 8.15-4
8.15.5 Criteria Pollutant Emissions and Ambient Air Quality Standards ........ 8.15-5
8.15.6 Greenhouse Gas Emissions ........ 8.15-6
8.15.7 References ........ 8.15-7

## LIST OF TABLES

Table 8.15-1. Federal and State Ambient Air Quality Standards ........ 8.15-10

Table 8.15-2. Attainment Status Designations for the Mono Basin Planning Area ........ 8.15-12

## List of Acronyms

| | |
|---|---|
| AAQS | ambient air quality standard |
| AB | Assembly Bill |
| CAA | Clean Air Act |
| CAAQS | California ambient air quality standards |
| CARB | California Air Resources Board |
| CO | carbon monoxide |
| District | Great Basin Unified Air Pollution Control District |
| EPA | United States Environmental Protection Agency |
| GBUAPCD | Great Basin Unified Air Pollution Control District |
| GHG | greenhouse gas |
| NAAQS | national ambient air quality standards |
| NESHAP | National Emission Standards for Hazardous Air Pollutants |
| $NO_2$ | nitrogen dioxide |
| NOx | nitrogen oxide |
| $O_3$ | ozone |
| PM | particulate matter |
| $PM_{2.5}$ | fine particulate matter (2.5 microns or less in diameter) |
| $PM_{10}$ | respirable particulate matter (with a diameter of 10 microns or less) |
| Project | Rush Creek Project |
| SB | Senate Bill |
| SIP | State Implementation Plan |
| $SO_2$ | sulfur dioxide |
| TAC | toxic air contaminant |

## 8.15 AIR QUALITY AFFECTED ENVIRONMENT

This section describes air quality in the vicinity of Southern California Edison Company's Rush Creek Project (Project) including: an overview of the regulatory setting; a description of the Project area; identification of federal and state ambient air quality standards; and the Project area federal and state ambient air standard attainment status.

### 8.15.1 Information Sources

This section was developed using information available from various federal, state, and local agencies responsible for air quality regulation. These include:

- United States Environmental Protection Agency (EPA);
- California Air Resources Board (CARB); and
- Great Basin Unified Air Pollution Control District (GBUAPCD or District).

### 8.15.2 Regulatory Setting – Air Quality Statutes and Programs

This section summarizes key federal, state, and local statutes, regulations, and policies that apply to the Project. At the federal level, the EPA administers the federal Clean Air Act (CAA). The California CAA is administered by the CARB at the state level and by the GBUAPCD at the local level.

#### 8.15.2.1 Federal

**Federal Clean Air Act**

At the federal level, EPA is responsible for implementing national air quality programs. EPA's air quality mandates are primarily derived from the federal CAA, which was enacted in 1970. The CAA required EPA to establish national ambient air quality standards (NAAQS), as shown on Table 8.15-1, and established deadlines for their attainment. The federal CAA also required each state to prepare an air quality control plan referred to as a State Implementation Plan (SIP).

**National Emission Standards for Hazardous Air Pollutants**

The EPA established the National Emission Standards for Hazardous Air Pollutants (NESHAP) as required by the federal CAA. These are technology-based source-specific regulations that limit allowable emissions of hazardous air pollutants. Among these sources include asbestos-containing building materials. NESHAPs include requirements pertaining to the inspection, notification, handling, and disposal of asbestos-containing materials associated with the demolition and renovation of structures.

#### 8.15.2.2 State

**California Clean Air Act**

CARB, which is part of the California Environmental Protection Agency, is responsible for meeting the state requirements of the federal CAA, administering the California CAA, and establishing the California ambient air quality standards (CAAQS). The California CAA requires all air districts in the state to endeavor to achieve and maintain the CAAQS by the earliest practical date. While many of the same pollutants are regulated under the federal CAA and the California CAA, the CAAQS are more stringent than the corresponding federal standards and incorporate additional standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility reducing particles. CARB also oversees the functions of local air pollution control districts and air quality management districts, which in turn administer air quality activities at the regional level.

**Assembly Bill 1807 and Assembly Bill 2588: Toxic Air Contaminants**

Within California, toxic air contaminants (TAC) are regulated primarily through Assembly Bill (AB) 1807 (Tanner Air Toxics Act) and AB 2588 (Air Toxics Hot Spots Information and Assessment Act of 1987). The Tanner Air Toxics Act sets forth a formal procedure for CARB to designate substances as TACs. This includes research, public participation, and scientific peer review before CARB designates a substance as a TAC.

#### 8.15.2.3 Local

The GBUAPCD is the local agency responsible for air quality regulation within Inyo, Mono, and Alpine counties. The purpose of the GBUAPCD is to enforce federal, state, and local air quality regulations and to ensure that the NAAQS and CAAQS are met within the District. The GBUAPCD also issues permits for stationary sources of air pollutants, monitors local air quality, and responds to citizen complaints (GBUAPCD 2024).

Projects within the jurisdiction of the GBUAPCD are subject to various District rules and regulations. Specific rules that may be applicable to the Project include the following (GBUAPCD 2022):

- **200, Permits Required**: This rule identifies activities within the District that require an Authority to Construction permit or a Permit to Operate.
- **209-A, Standards for Authorities to Construct**: This rule establishes standards for the issuance of Authority to Construct permits and sets forth mitigation requirements for construction activities that may result in an exceedance of an ambient air quality standard (AAQS).
- **309, Asbestos Removal and Demolition Fees**: The purpose of this rule is to recover costs for the review and management of asbestos removal and demolition projects within the District as required by the NESHAPs. The fees apply to all demolition projects regardless of the presence of asbestos.

- **401, Fugitive Dust**: This rule requires that emissions of fugitive dust be limited to the maximum extent practicable. Recommended measures that may be relevant to the Project include:
  - Use, where possible, of water or chemicals for control of dust in the demolition of existing structures, construction operations, or the clearing of land;
  - Application of asphalt, water, or suitable chemicals on dirt roads, material stockpiles, and other surfaces which can give rise to airborne dusts;
  - Use of water, chemicals, chuting, venting, or other precautions to prevent particulate matter from becoming airborne in handling dusty materials to open stockpiles and mobile equipment; and
  - Maintenance of roadways in a clean condition.
- **404-A, Particulate Matter**: This rule establishes the maximum allowable emission rate of particulate matter (PM).
- **404-B, Oxides of Nitrogen**: This rule limits the emissions of nitrogen oxides (NOx) from fuel burning equipment and sources other than combustion.

### 8.15.3 Regulatory Setting – Greenhouse Gas Statutes and Programs

#### 8.15.3.1 Federal

There are currently no federal regulations governing greenhouse gas (GHG) emissions that are applicable to the Project. Summaries of principal state GHG statutes and programs are presented below.

#### 8.15.3.2 State

**Assembly Bill 32 and Senate Bill 32: Global Warming Solutions Act**

AB 32 required that GHGs emitted in California be reduced to 1990 levels by the year 2020. GHGs, as defined under AB 32, include carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur dioxide ($SO_2$). Since AB 32 was enacted, a seventh chemical, nitrogen trifluoride, has also been added to the list of GHGs. California announced in July 2018 that the state emitted 427 million metric tons of carbon dioxide equivalents in 2016 and achieved AB 32 goals (CARB 2018).

Senate Bill (SB) 32 was signed into law on September 8, 2016. SB 32 states that “the state [air resources] board shall ensure that statewide GHG emissions are reduced to at least 40 percent below the statewide GHG emissions limit no later than December 31, 2030.”

### Assembly Bill 1279: The California Climate Crisis

AB 1279 was signed into law in 2022 and establishes the policy of the state to achieve carbon neutrality as soon as possible, but no later than 2045, and maintain net negative GHG emissions thereafter. The bill would require CARB to ensure that an updated Scoping Plan identifies and recommends measures to achieve carbon neutrality, and to identify and implement policies and strategies that enable carbon dioxide removal and carbon capture, utilization, and storage technologies to complement AB 1279's emissions reduction requirements.

### Senate Bill 1078: Renewable Electricity Standards

SB 1078 (September 12, 2002) required California to generate 20 percent of its electricity from renewable sources by 2017. On November 17, 2008, the governor signed Executive Order S-14-08, which established the Renewable Portfolio Standard target for California requiring that all retail sellers of electricity serve 33 percent of their load with renewable energy by 2020. Executive Order S-21-09 directed CARB to adopt a regulation by July 31, 2010, requiring the state's load serving entities to meet a 33 percent renewable energy target by 2020. Renewable sources of electricity include wind, small hydropower, solar, geothermal, biomass, and biogas.

### Senate Bill 100: California Renewables Portfolio Standard Program

SB 100 (September 10, 2018) revised the Renewable Portfolio Standard goals to achieve the 50 percent renewable resources target by December 31, 2026, and to achieve a 60 percent target by December 31, 2030. The bill also establishes a state policy that eligible renewable energy resources and zero-carbon resources supply 100 percent of all retail sales of electricity to California end-use customers and 100 percent of electricity procured to serve all state agencies by December 31, 2045. Under the bill, the State cannot increase carbon emissions elsewhere in the western grid or allow resource shuffling to achieve the 100 percent carbon-free electricity target.

### 8.15.3.3 Local

There are currently no local regulations directly related to GHG emissions that are applicable to the Project. However, several of the local air quality regulations summarized in Section 8.15.3.2 would have indirect effects on GHG emissions.

## 8.15.4 Project Area

To better manage regional air quality problems, California is divided into 15 air basins, each of which is associated with one or more air districts. The GBUAPCD is one of 35 local air districts established pursuant to Section 40002 of the California Health & Safety Code. The GBUAPCD is a "multi-county" air district with its jurisdiction consisting of Alpine, Mono, and Inyo counties, which constitute the entire Great Basin Valleys Air Basin.

The Project is located in the southern portion of the Mono Basin Planning Area, east of Yosemite National Park. The Project area is heavily forested, rural in nature, and sparsely populated. There are no residential or commercial developments in the immediate vicinity of the Project. The nearest population center is the community of June Lake, which is approximately 4 miles southwest of the Project.

#### 8.15.4.1 Climate and Meteorology

Mono Basin is bound by the eastern escarpment of the Sierra Nevada to the west and by the Great Basin ranges to the north, south, and east, with Mono Lake in the central area of the basin. The Mono Basin Planning Area is semi-arid in nature with annual precipitation for most of the area ranging from six to 10 inches per year. The temperature is typical of the high desert with cold winters and cool summers. Wind patterns vary at different locations throughout Mono Basin. The differences in wind direction appear to be related to topographic features, with Mono Lake effects and upslope/downslope winds exerting strong influences (GBUAPCD 1995).

### 8.15.5 Criteria Pollutant Emissions and Ambient Air Quality Standards

Both the EPA and the CARB have established AAQS for common pollutants (Table 8.15-1). The AAQS for each contaminant represent safe levels that avoid specific adverse health effects. Pollutants for which air quality standards have been established are called “criteria” pollutants. Criteria pollutants include ozone ($O_3$), carbon monoxide (CO), nitrogen dioxide ($NO_2$), $SO_2$, respirable particulate matter ($PM_{10}$), and fine particulate matter ($PM_{2.5}$). The criteria pollutants are summarized below (EPA 2024a):

- **Ozone**. The majority of ground-level $O_3$ is formed as a result of complex photochemical reactions in the atmosphere between reactive organic gases, NOx, and oxygen. Reactive organic gases and NOx are considered precursors to the formation of $O_3$, a highly reactive gas that can damage lung tissue and affect respiratory function.

- **Carbon Monoxide**. CO is a colorless, odorless, poisonous gas produced by the incomplete combustion of fossil fuels. Elevated levels of CO can result in harmful health effects and can also contribute to global climate change.

- **Nitrogen Dioxide**. $NO_2$ is a brownish, highly reactive gas primarily produced as a result of the burning of fossil fuels. $NO_2$ can cause respiratory ailments, especially in the young and elderly, and can lead to degradations in the health of aquatic and terrestrial ecosystems.

- **Sulfur Dioxide**. $SO_2$ is primarily emitted from the combustion of coal and oil by steel mills, pulp and paper mills, and non-ferrous smelters. High concentrations of $SO_2$ can aggravate existing respiratory and cardiovascular diseases in asthmatics and others who suffer from emphysema or bronchitis.

- **Particulate Matter**. Airborne PM is not a single pollutant but, rather, is a complex mixture of solids and aerosols composed of small droplets of liquid, dry solid fragments, and solid cores with liquid coatings. Particles are defined by their diameter for air quality regulatory purposes. Those with a diameter of 10 microns or less ($PM_{10}$) are inhalable into the lungs and can induce adverse health effects. Fine PM is defined as particles that are 2.5 microns or less in diameter ($PM_{2.5}$). Therefore, $PM_{2.5}$ compromises a portion of $PM_{10}$. Emissions from combustion of gasoline, oil, diesel fuel or wood produce much of the $PM_{2.5}$ pollution found in outdoor air, as well as significant proportion of $PM_{10}$. $PM_{10}$ also includes dust from construction sites, landfills and agriculture, wildfires and brush/waste burning, industrial sources, windblown dust from open lands, pollen, and fragments of bacteria.

#### 8.15.5.1 Attainment Status

The federal CAA and the California CAA require all areas of California to be classified as attainment, nonattainment, or unclassified as to their status with regard to the federal and/or state AAQS. Where insufficient data exists to make a determination, an area is deemed "unclassified". Where a nonattainment area has achieved attainment or where an attainment area is at risk of becoming nonattainment, it can be classified as a "maintenance" area in order to implement preventive measures. The State and air districts in California monitor air pollutant levels to assure that federal and state AAQS are met and, if they are not, to develop strategies to meet these standards.

The Mono Basin Planning Area, in which the Project is located, is designated as moderate nonattainment of the state and federal $PM_{10}$ standard, and Mono County is a nonattainment area for the state standard for ozone (CARB 2024). The $PM_{10}$ nonattainment status in the Mono Basin is caused by windblown dust from the exposed lakebed of Mono Lake (GBUAPCD 2015). The area is in attainment or unclassified for all other CAAQS and NAAQS (Table 8.15-2).

### 8.15.6 Greenhouse Gas Emissions

Gases that trap heat in the atmosphere, GHGs, regulate the earth's temperature. This phenomenon, known as the greenhouse effect, is responsible for maintaining a habitable climate. The most common GHGs are carbon dioxide and water vapor, but there are also several others, including: methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. GHGs are released into the earth's atmosphere through a variety of natural processes and human activities.

Each GHG differs in its ability to absorb heat in the atmosphere based on the lifetime, or persistence, of the gas molecule in the atmosphere. Often, estimates of GHG emissions are presented in carbon dioxide equivalents, which weight each gas by its global warming potential.

On a global scale, GHG emissions are predominantly associated with activities related to energy production; changes in land use, such as deforestation and land clearing; industrial sources; agricultural activities; transportation; waste and wastewater generation; and commercial and residential land uses. World-wide, energy production including the burning of coal, natural gas, and oil for electricity and heat is the largest single source of global GHG emissions.

In 2021, GHG emissions within California totaled 381.3 million metric tons of carbon dioxide equivalents. The transportation sector is the largest contributor and accounted for approximately 38 percent of the total statewide GHG emissions. Most transportation emissions are derived from passenger vehicles and heavy-duty trucks. Emissions associated with industrial uses are the second largest contributor, totaling roughly 19 percent. Industrial emissions are driven by fuel combustion from sources that include refineries, oil and gas extraction, cement plants, and the portion of cogeneration emissions attribution to thermal energy output. Electricity generation (in-state and imports) totaled roughly 16 percent. Emissions from the electricity generation sector have declined over the years due to the increase in renewable generation that continues to replace fossil power (CARB 2023).

### 8.15.7 References

CARB (California Air Resources Board). 2016. Ambient Air Quality Standards. Available online at: https://ww2.arb.ca.gov/sites/default/files/2020-07/aaqs2.pdf. Accessed March 2024.

_____. 2018. Climate Pollutants Fall Below 1990 Levels for the First Time. Available online at: https://ww2.arb.ca.gov/news/climate-pollutants-fall-below-1990-levels-first-time. Accessed March 2024.

_____. 2023. California Greenhouse Gas Emissions for 2000 to 2021: Trends of Emissions and Other Indicators. Available online at: https://ww2.arb.ca.gov/sites/default/files/2023-12/2000_2021_ghg_inventory_trends.pdf. Accessed March 2024.

_____. 2024. Maps of State and Federal Area Designations. Available online at: https://ww2.arb.ca.gov/resources/documents/maps-state-and-federal-area-designations. Accessed March 2024.

EPA (U.S. Environmental Protection Agency). 2024a. Criteria Air Pollutants. Available online at: https://www.epa.gov/criteria-air-pollutants?msclkid=402121eaa62811ec9f3a5e32e281714a. Accessed March 2024.

_____. 2024b. Particle Pollution Designations Memorandum and Data for the 2024 Revised Annual PM2.5 NAAQS. Available online at: https://www.epa.gov/particle-pollution-designations/particle-pollution-designations-memorandum-and-data-2024-revised#:~:text=On%20February%207%2C%202024%2C%20the%20EPA%20promulgated%20a,cubic%20meter%20%28%C2%B5g%2Fm%203%29%20to%209.0%20%C2%B5g%2Fm%203.. Accessed March 2024.

GBUAPCD (Great Basin Unified Air Pollution Control District). 1995. Mono Basin PM-10 SIP, Description of the Planning Area, Physical Characteristic, Climatic Conditions, Diversion of Tributary Streams. Available online at: https://www.gbuapcd.org/Docs/District/AirQualityPlans/MonoBasin/SECT2.pdf. Accessed March 2024.

_____. 2015. Reasonable Further Progress Report for the Mono Basin PM-10 State Implementation Plan. September. Available online at: https://gbuapcd.org/Docs/District/AirQualityPlans/MonoBasin/MonoBasinReasonableFurtherProgressReport2015.pdf. Accessed March 2024.

_____. 2022. Rules and Regulations for the Great Basin Unified Air Pollution Control District. Available online at: https://www.gbuapcd.org/Docs/PermittingAndRules/RulesAndRegulations/GBUAPCD_Rules%20and%20Regulations.pdf. Accessed March 2024.

_____. 2024. About Us. Available online at: https://www.gbuapcd.org/District/AboutUs/. Accessed March 2024.

# TABLES

## Table 8.15-1. Federal and State Ambient Air Quality Standards

| Pollutant | Averaging Time | California Standards[1] | National Standards[2] | |
|---|---|---|---|---|
| | | | Primary | Secondary |
| Ozone ($O_3$) | 8-hour | 0.070 ppm (137 µg/m$^3$) | 0.070 ppm (137 µg/m$^3$) | Same as Primary Standards |
| | 1-hour | 0.09 ppm (180 µg/m$^3$) | -- | |
| Carbon monoxide (CO) | 8-hour | 9.0 ppm (10 mg/m$^3$) | 9 ppm (10 mg/m$^3$) | -- |
| | 1-hour | 20 ppm (23 mg/m$^3$) | 35 ppm (40 mg/m$^3$) | |
| Nitrogen dioxide ($NO_2$) | Annual arithmetic mean | 0.030 ppm (57 µg/m$^3$) | 0.053 ppm (100 µg/m$^3$) | Same as Primary Standard |
| | 1-hour | 0.18 ppm (339 µg/m$^3$) | 100 ppb (188 µg/m$^3$) | |
| Sulfur dioxide ($SO_2$) | Annual arithmetic mean | -- | 0.030 ppm (80 µg/m$^3$) | -- |
| | 24-hour | 0.04 ppm (105 µg/m$^3$) | 0.14 ppm (80 µg/m$^3$) | -- |
| | 3-hour | -- | -- | 0.5 ppm (1300 µg/m$^3$) |
| | 1-hour | 0.25 ppm (655 µg/m$^3$) | -- | -- |
| Respirable Particulate Matter Smaller than 10 Microns in Diameter ($PM_{10}$) | Annual arithmetic mean | 20 µg/m$^3$ | -- | Same as Primary Standards |
| | 24-hour | 50 µg/m$^3$ | 150 µg/m$^3$ | |
| Respirable Particulate Matter Smaller than 2.5 Microns in Diameter ($PM_{2.5}$)[3] | Annual arithmetic mean | 12 µg/m$^3$ | 9.0 µg/m$^3$ | 15 µg/m$^3$ |
| | 24-hour | No separate standard | 35 µg/m$^3$ | Same as Primary Standards |
| Sulfates | 24-hour | 25 µg/m$^3$ | -- | -- |
| Lead (Pb) | 30-day average | 1.5 µg/m$^3$ | -- | -- |
| | Calendar quarter | -- | 1.5 µg/m$^3$ | Same as Primary Standard |
| | Rolling 3-month average | -- | 0.15 µg/m$^3$ | |
| Hydrogen sulfide ($H_2S$) | 1-hour | 0.03 ppm (42 µg/m$^3$) | -- | -- |

| Pollutant | Averaging Time | California Standards[1] | National Standards[2] | |
|---|---|---|---|---|
| | | | Primary | Secondary |
| Vinyl chloride (chloroethene) | 24-hour | 0.01 ppm (26 μg/m$^3$) | -- | -- |
| Visibility reducing particles | 8-hour | In 1989, the Air Resources Board converted the general statewide 10-mile visibility standard to instrumental equivalents, which are extinction of 0.23 per kilometer. | -- | -- |

*Source: CARB 2016, EPA 2024b*

Notes: -- = no standard established
μg/m$^3$ = micrograms per cubic meter
mg/m$^3$ = milligrams per cubic meter
ppm = parts per million

[1] CO, $SO_2$ (1- and 24-hour), $NO_2$, $O_3$, $PM_{10}$, and visibility reducing particles standards are not to be exceeded.

[2] Not to be exceeded more than once a year except for annual standards.

[3] On February 7, 2024, the EPA issued a pre-publication version of the Final Rule to lower the primary annual NAAQS for $PM_{2.5}$ from 12.0 μg/m$^3$ to 9.0 μg/m$^3$ (EPA 2024b).

### Table 8.15-2. Attainment Status Designations for the Mono Basin Planning Area

| Pollutant | Federal Designation | State Designation |
|---|---|---|
| Ozone ($O_3$) | Unclassified/Attainment | Nonattainment |
| Carbon Monoxide (CO) | Unclassified/Attainment | Attainment |
| Nitrogen Dioxide ($NO_2$) | Unclassified/Attainment | Attainment |
| Sulfur Dioxide ($SO_2$) | Unclassified/Attainment | Attainment |
| Respirable Particulate Matter ($PM_{10}$) | Nonattainment - Moderate | Nonattainment |
| Fine Particulate Matter ($PM_{2.5}$) | Unclassified/Attainment | Attainment |

*Source: CARB 2024*

## TABLE OF CONTENTS

Page

8.16 Noise ....................................................................................... 8.16-1
8.16.1 Information Sources ........................................................................ 8.16-1
8.16.2 Noise Metrics ............................................................................... 8.16-1
8.16.3 Existing Noise Conditions ................................................................. 8.16-2
8.16.4 References ................................................................................... 8.16-3

## LIST OF TABLES

Table 8.16-1. Typical Noise Levels ........................................................ 8.16-5

Table 8.16-2. Ambient Noise Levels at Points of Interest Near the Rush Creek Project in October 2023 .................................................... 8.16-6

## LIST OF MAPS

Map 8.16-1. Noise Measurement Points ........................................................ 8.16-8

## LIST OF ACRONYMS

| | |
|---|---|
| dB | decibel |
| $L_{max}$ | Maximum Sound Level |
| $L_{eq}$ | Equivalent Sound Level |
| $L_n$ | percentile level |
| Project | Rush Creek Project |
| SEL | Sound Exposure Level |
| SR-158 | State Route 158 |
| TSR | Technical Study Report |

## 8.16 NOISE

The following section describes noise in the vicinity of Southern California Edison Company's Rush Creek Project (Project).

### 8.16.1 Information Sources

This section was developed using information available in the Draft LAND 2 – Noise Technical Study Report (LAND 2 – TSR) (SCE 2024). Additional references are cited in the text, as appropriate.

### 8.16.2 Noise Metrics

Noise metrics quantify sounds so they can be compared with each other, and with their effects, in a standard way. The following are common metrics used to describe the noise environment.

- **Maximum Sound Level ($L_{max}$)** represents the highest sound level measured during a single event in which the sound changes with time. $L_{max}$ is the maximum level that occurs over a fraction of a second. It does not fully describe the noise, because it does not account for how long the sound is heard.

- **Equivalent Sound Level ($L_{eq}$)** is a "cumulative" metric that combines a series of noise events representing the decibel average of all sounds in a time period. The time period of an $L_{eq}$ measurement is usually related to a particular activity that dictates the duration. Common periods for $L_{eq}$ include 10-minute, 1-hour, and 24-hour durations, which depend upon the particular environment and nature of noise sources. Construction equipment noise reported as $L_{eq(1hr)}$, is the most commonly used duration because construction activity often varies throughout a construction project and throughout each day.

- **Sound Exposure Level (SEL)** is the equivalent of the total sound energy over a stated period. It takes into consideration both the received sound level and the extent of the exposure. It is similar to the $L_{eq}$ as the total sound energy is integrated over the measurement period. However, instead of averaging over the measurement period, a reference duration of 1 second is used. SEL is a frequently used measure of noise exposure for an individual aircraft noise event; it measures the total noise energy produced during an event, from the time when the sound level first exceeds a threshold (normally just above the background or ambient noise) to the time that it drops below the threshold.

- **Percentile Levels ($L_n$) ($L_{10}$, $L_{50}$, and $L_{90}$)** are statistical descriptors of sound defined as the sound level exceeded "n" percent of the measurement period. For example, the $L_{90}$ metric reports the noise level that is exceeded 90 percent of the time during the measurement period and is considered to represent the background noise without transient sources of noise. In situations where the source of interest is constant, such as a generator, and ambient noise level varies (e.g., due to traffic noise), $L_{90}$ may adequately describe the noise source (FHWA 2017).

For any noise source, several factors affect the efficiency of sound transmission traveling from the source, which in turn affects the potential noise impact at offsite locations. Important factors include distance from the source, frequency of the sound, absorbency, and roughness of the intervening ground (or water) surface, the presence or absence of obstructions such as buildings and their absorbency or reflectivity, and the duration of the sound. Table 8.16-1 presents typical noise levels of some familiar noise sources and activities.

### 8.16.3 Existing Noise Conditions

Ambient noise levels in the vicinity of the Project were measured in October 2023 at points of interest that could be impacted by Project activities as part of the Draft LAND 2 – TSR (SCE 2024). Ambient noise was characterized in terms of $L_{eq}$, $L_{10}$, $L_{50}$, and $L_{90}$, and $L_{max}$ utilizing the proper sound measurement equipment for the necessary level of accuracy, refer to the Draft LAND 2 – TSR (SCE 2024). Map 8.16-1 illustrates the locations (Points of Interest) from which ambient noise measurements were collected. Results from this study are provided in Table 8.16-2.

#### 8.16.3.1 Existing Project Facilities

Sources of noise associated with existing operation of Project facilities is primarily limited to the noise generated by the Rush Creek Powerhouse. Ambient noise measurements were collected at the Rush Creek Powerhouse in October 2023. The ambient noise (measured in $L_{eq(10min)}$) for locations immediately adjacent to the powerhouse (PH-1, PH-2, PH-3) ranged from 42.5 to 75.9 decibels (dB), while monitoring locations within the residential areas on the other side of State Route 158 (SR-158) (PH-4, PH-5, PH-6, PH-7, PH-8) ranged from 41 to 54 dB. For a complete discussion on the noise environment associated with powerhouse operation, including under power generation versus no power generation scenarios, refer to the Draft LAND 2 – TSR (SCE 2024).

#### 8.16.3.2 State Route 158

Ambient noise measurements were collected at locations south of the powerhouse along SR-158 (JM-1 and CO-2) and at locations north of the powerhouse along SR-158 (TR-1, TR-2, and TR-3). The existing $L_{eq(10min)}$ at JM-1 was found to be approximately 55 dB, with sound levels dropping to below 40 dB during periods without highway traffic (as shown by the $L_{90}$) and increasing to an $L_{max}$ of over 90 dB due to a passing motorcycle. Similarly, the existing $L_{eq(10min)}$ at CO-2 was measured between 48 and 52 dB, with $L_{90}$ approximately 45 dB and $L_{max}$ over 90 dB. North of the powerhouse along SR-158 (TR-1, TR-2, and TR-3) noise ranged from 42 to 47 dB ($L_{eq(10min)}$). The maximum single event noise levels, captured by $L_{max}$, ranged from 71 to 88 dB due to a combination of passing vehicle traffic and people talking or recreating in the camping areas. However, these louder events only constituted a small portion of the measurement period, which is shown by the $L_{90}$, $L_{50}$, and $L_{10}$ levels, almost all of which are below 50 dB. For instance, the $L_{10}$

at TR-3, ranging from 40.4 to 45.8 dB, corresponds to sound levels less than those values during 90 percent of the time of the 10-minute measurement.

### 8.16.3.3 Natural Environment

While natural features are not considered to be sources of noise, the sound generated by such features nonetheless contribute to ambient noise within a given location. Locations in the vicinity of the Project where ambient noise levels are limited to natural features only include Inyo National Forest and the Ansel Adams Wilderness. Aspects of the natural environment that may contribute to ambient noise include wind moving through forest canopies, which may produce periods of elevated sound levels 10 to 15 dB greater than typical background levels; weather-related phenomena such as thunder, rockslides, and avalanches, which may result in temporary increase of sound levels 50 dB (Mono County 2002); and noise from flowing water along creeks. Multiple creeks, including Rush Creek and Reversed Creek, descend steeply from surrounding high elevation peaks near the location of the powerhouse and SR-158 and produce noise levels that dominate the background soundscape in the vicinity of the creek, which fades to barely audible several hundred feet away. The magnitude of the sound levels from flowing water varies throughout the year based upon changes in flow rate.

## 8.16.4 References

Caltrans (California Department of Transportation). 2013. Technical Noise Supplement to the Traffic Noise Analysis Protocol. September.

FHWA (Federal Highway Administration). 2017. Sound Level Descriptors FHWA-HEP-17-053. May.

Mono County. 2002. June Lake Master Environmental Assessment. 2002. Available at: https://www.monocounty.ca.gov/planning/page/june-lake-area-plan.

SCE (Southern California Edison Company). 2024. Draft LAND 2 – Noise Technical Study Report. August. Available in Supporting Document A of the Application for New License.

# TABLES

## Table 8.16-1. Typical Noise Levels

| Common Outdoor Activities | Noise Level (dB) | Common Indoor Activities |
|---|---|---|
| | 110 | Rock band |
| Jet flyover at 1,000 feet | | |
| | 100 | |
| Gas lawnmower at 3 feet | | |
| | 90 | |
| Diesel truck at 50 feet at 50 miles per hour | | Food blender at 3 feet |
| | 80 | Garbage disposal at 3 feet |
| Noisy urban area, daytime | | |
| Gas lawnmower at 100 feet | 70 | Vacuum cleaner at 10 feet |
| Commercial area | | Normal speech at 3 feet |
| Heavy traffic at 300 feet | 60 | |
| | | Larger business office |
| Quiet urban daytime | 50 | Dishwasher in next room |
| | | |
| Quiet urban nighttime | 40 | Theater, larger conference room (background) |
| Quiet suburban nighttime | | |
| | 30 | Library |
| Quiet rural nighttime | | Bedroom at night, concert hall (background) |
| | 20 | |
| | | Broadcast/recording studio |
| | 10 | |
| | | |
| | 0 | |

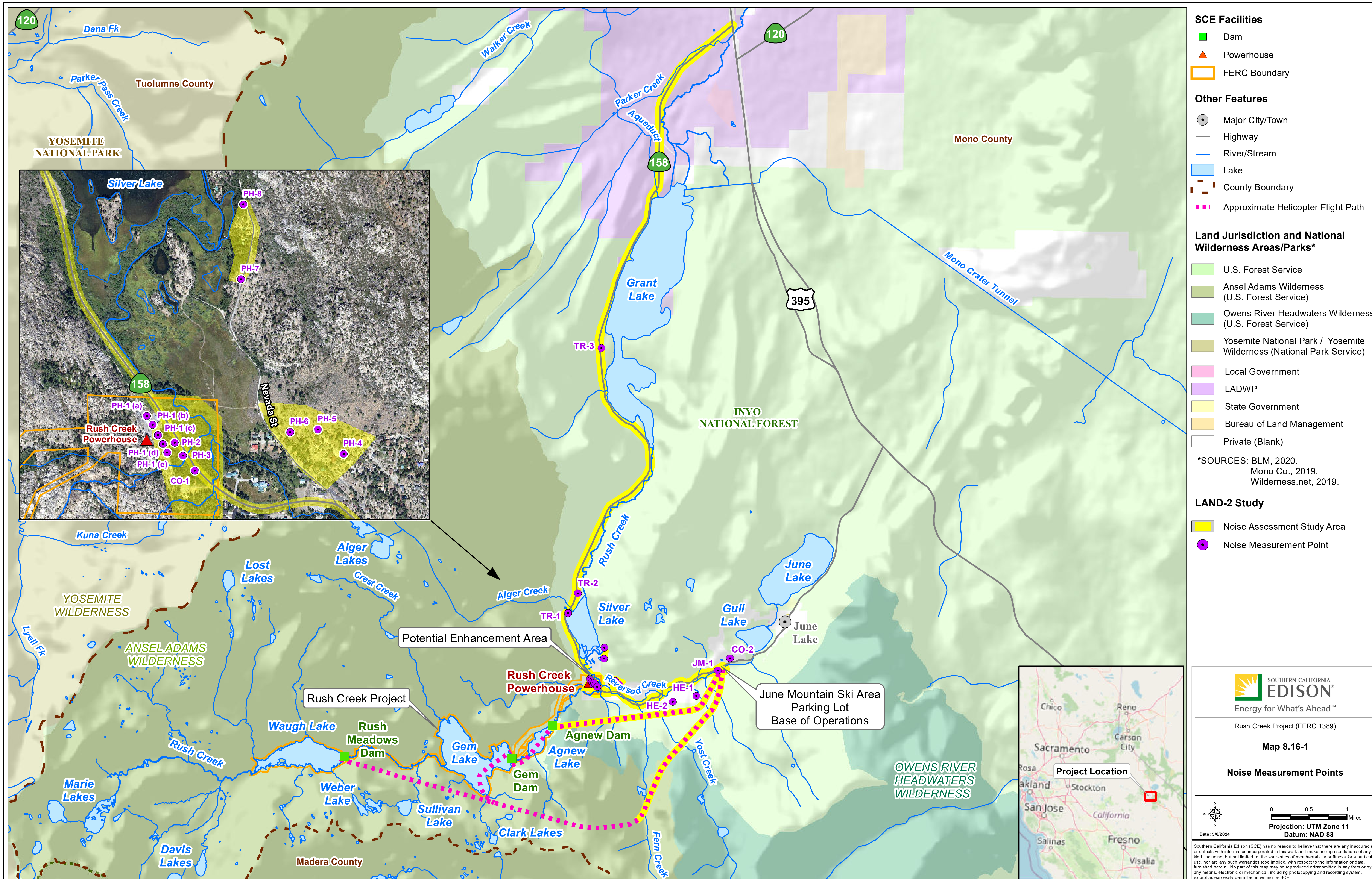
*Source: Caltrans 2013*

## Table 8.16-2. Ambient Noise Levels at Points of Interest Near the Rush Creek Project in October 2023

| Location | Date | Start Time | $L_{eq(10min)}$ | $L_{max}$ | $L_{10}$ | $L_{50}$ | $L_{90}$ |
|---|---|---|---|---|---|---|---|
| PH-2 | 24-Oct | 9:42 a.m. | 59.6 | 85.3 | 59.8 | 58.9 | 58.2 |
| PH-2 | 24-Oct | 9:27 a.m. | 60.3 | 85.9 | 60.6 | 59.1 | 58.2 |
| PH-3 | 24-Oct | 9:25 a.m. | 59 | 85.2 | 59.4 | 58 | 57.5 |
| PH-4 | 24-Oct | 10:45 a.m. | 41.3 | 85.3 | 40.9 | 38.7 | 37 |
| PH-4 | 24-Oct | 10:30 a.m. | 42.5 | 80.2 | 40.5 | 40.2 | 38.6 |
| PH-5 | 24-Oct | 10:43 a.m. | 40.6 | 86.9 | 42.4 | 39.6 | 38.1 |
| PH-5 | 24-Oct | 10:27 a.m. | 41.7 | 83.9 | 42.6 | 41.6 | 39.9 |
| PH-6 | 24-Oct | 11:38 a.m. | 42.5 | 76.3 | 43.7 | 42.4 | 41.2 |
| PH-6 | 24-Oct | 11:21 a.m. | 43.1 | 74.5 | 44.1 | 42.8 | 41.8 |
| PH-7 | 25-Oct | 11:41 a.m. | 53 | 106.9 | 53 | 46.3 | 42.4 |
| PH-7 | 25-Oct | 11:23 a.m. | 54.9 | 91.8 | 46.8 | 42.6 | 39.2 |
| PH-8 | 25-Oct | 11:42 a.m. | 52.2 | 92.5 | 51.4 | 44.8 | 41.6 |
| PH-8 | 25-Oct | 11:25 a.m. | 53.5 | 85.3 | 43.9 | 40.5 | 39.5 |
| JM-1 | 24-Oct | 1:03 p.m. | 54.9 | 91.6 | 60 | 45.4 | 39.3 |
| JM-1 | 24-Oct | 12:52 p.m. | 54.2 | 85 | 57 | 43.5 | 35.6 |
| CO-1 | 25-Oct | 10:49 a.m. | 59.8 | 96.1 | 60 | 47.2 | 44.2 |
| CO-1 | 25-Oct | 10:34 a.m. | 61.5 | 104 | 65 | 46.0 | 44.4 |
| CO-1 | 25-Oct | 10:18 a.m. | 61.5 | 90.5 | 66 | 50.8 | 45.5 |
| CO-2 | 25-Oct | 9:45 a.m. | 51.1 | 96.1 | 54 | 49.1 | 45.1 |
| CO-2 | 25-Oct | 9:29 a.m. | 48.4 | 88.6 | 52 | 46.7 | 43.2 |
| HE-1 | 24-Oct | 1:58 p.m. | 42.6 | 80.6 | 41 | 35.6 | 34.5 |
| HE-2 | 24-Oct | 1:37 p.m. | 33.3 | 67 | 34 | 32.6 | 32.1 |
| HE-2 | 24-Oct | 1:24 p.m. | 32.9 | 68.9 | 34 | 32.5 | 31.8 |
| TR-1 | 24-Oct | 3:40 p.m. | 45.4 | 76.9 | 47.4 | 41.2 | 39.2 |
| TR-1 | 24-Oct | 3:27 p.m. | 47.6 | 83.5 | 51.5 | 42.1 | 39.5 |
| TR-2 | 24-Oct | 15:11 p.m. | 42.4 | 77.1 | 44.3 | 40.9 | 38.9 |
| TR-3 | 24-Oct | 2:47 p.m. | 40.1 | 71.3 | 40.4 | 33.3 | 30.9 |
| TR-3 | 24-Oct | 2:36 p.m. | 47 | 87.9 | 45.8 | 31.7 | 29.5 |

*Source: Draft LAND 2 – TSR (SCE 2024)*

# MAPS




C:\GIS\237800343\map\Rush Creek\LandMaps\SCE_RUSH_CREEK_LAND2_TSP_NMPs_17i11i_01.mxd

## TABLE OF CONTENTS

Page

8.17 Traffic ........ 8.17-1
8.17.1 Information Sources ........ 8.17-1
8.17.2 Setting ........ 8.17-1
8.17.3 References ........ 8.17-5

## LIST OF TABLES

Table 8.17-1. 2022 Caltrans Annual Average Daily Traffic Data: US-395 from the SR-203 Junction to the Lee Vining Visitor Center ........ 8.17-7

Table 8.17-2. 2022 Caltrans Annual Average Daily Traffic Data: SR-158 from the June Lake Junction to the Grant Lake Junction ........ 8.17-7

## LIST OF MAPS

Map 8.17-1. Major Transportation Routes in the June Lake Area ........ 8.17-9

## LIST OF ACRONYMS

| | |
|---|---|
| AADT | Annual Average Daily Traffic |
| Caltrans | California Department of Transportation |
| ESTA | Eastern Sierra Transit Authority |
| mph | miles per hour |
| Project | Rush Creek Project |
| RTP | Regional Transportation Plan |
| SCE | Southern California Edison Company |
| SR-158 | State Route 158 |
| US-395 | United States Route 395 |
| YARTS | Yosemite Area Regional Transportation System |

## 8.17 TRAFFIC

This section describes the transportation and traffic setting in the vicinity of Southern California Edison Company's (SCE) Rush Creek Project (Project).

### 8.17.1 Information Sources

This section was developed using information available from various federal, state, and local agencies responsible for the management and administration of roads in the vicinity of the Project. These include:

- California Department of Transportation (Caltrans) District 9 Active Transportation Plan (Caltrans 2024)
- Caltrans Traffic Census Program (Caltrans 2022)
- Mono County Regional Transportation Plan (Mono County 2019)
- Eastern Sierra Transit Authority website (ESTA 2024)
- Yosemite Area Regional Transportation System website (YARTS 2024)

### 8.17.2 Setting

There are two major highways in the vicinity of the Project—United States Route 395 (US-395) a federal highway, and State Route 158 (SR-158), also known as the June Lake Loop, a state highway. Both US-395 and SR-158 are managed and maintained by the California Department of Transportation (Caltrans). Additional county-maintained roads and private roads serve residents and visitors to the town of June Lake. The private roads are mostly in community areas; many of them are substandard roads that do not meet the County Roadway Standards and as a result have not been accepted into the County Roadway System (Mono County 2019). The most prominent county-maintained road is Northshore Drive/June Lake Beach Road, which intersects SR-158 north and south of the town of June Lake and runs along the northwesterly shorelines of June Lake and Gull Lake. Refer to Map 8.17-1 for the major transportation routes in the June Lake area.

The following describes each of these three transportation routes, local traffic patterns and safety concerns identified in Mono County's Regional Transportation Plan (RTP) (Mono County 2019), and the public transit system that serves the town of June Lake and surrounding area.

### 8.17.2.1 Main Transportation Routes

**United States Route 395**

US-395 is the main transportation route along the eastern side of the Sierra. The Federal Highway Administration, an agency within the United States Department of Transportation, provides support to Caltrans for construction, improvement, inspection, and preservation of US-395 (FHWA 2023). The highway originates in the Mojave Desert at the junction with Federal Interstate 15 and continues north to the Canada-US border near Laurier, Washington. It is the principal route to and through Mono County and is the primary route suitable for emergency purposes.

Caltrans Traffic Census Program identifies 73 breakpoints along the entirety of US-395. The stretch of US-395 relevant to the Project is an approximately 26-mile segment between breakpoints near the Lee Vining Visitors Center in the town of Lee Vining (postmile 51.69) and at the US-395/SR-203 Junction near the Town of Mammoth Lakes (postmile 25.75). Caltrans defines this segment of US-395 as rural. Within this segment, US-395 is a separated highway with two lanes in each direction and a speed limit of 65 miles per hour (mph). There are no walking or biking prohibitions along the highway in this segment and no sidewalks. The highway shoulder is substantial but unprotected. Bicycle segments and crossings have been identified as needed in Caltrans District 9 Active Transportation Plan (Caltrans 2024). The segment from 1.1 mile north of SR-203 to SR-120 (23.8 miles) was officially designated into the State Scenic Highway Program on June 5, 2000. Refer to Map 8.9-4 for scenic designations within the vicinity of the Project.

During 2022 an average of 5,300 daily drivers headed north from the SR-203 Junction (near Mammoth Lakes) and an average of 3,600 daily drivers headed south from the Lee Vining Visitors Center. Refer to Table 8.17-1 for Annual Average Daily Traffic (AADT)[1] data for each postmile marker from SR-203 to the Lee Vining Visitor Center.

**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 highway follows a horseshoe shaped canyon containing four lakes – June, Gull, Silver, and Grant – and the town of June Lake. The highway has a single lane in each direction with a speed limit ranging between 55 mph and 35 mph (35 mph in the town of June Lake). SR-158 provides access to the Rush Creek Powerhouse which is located directly adjacent to SR-158 and south of Silver Lake. During the winter season, approximately 8.6 miles of SR-158 is closed between the northern junction of SR-158/US-395 to the powerhouse (Mono County 2019). SR-158 remains open year-round from the SR-158/US-395 southern junction to the powerhouse. Segments of SR-158 between Northshore Drive and the town of June Lake are designated avalanche zones (Mono County 2023). SR-158 is designated as eligible for

[1] Annual average daily traffic is the total traffic volume for the year divided by 365 days. The traffic count year is from October 1 through September 30 (Caltrans 2022).

inclusion in the State Scenic Highway Program. Refer to Map 8.9-4 for scenic designations within the vicinity of the Project.

Caltrans defines SR-158 as rural. SR-158 is the main street through the town of June Lake (Caltrans 2024). There are no walking or biking prohibitions along SR-158. The majority of SR-158 does not include sidewalks and the shoulder ranges from substantial and unprotected to no shoulder. There are one sided and dual sided sidewalks along SR-158 through the town of June Lake (Caltrans 2024). Pedestrian crossings have been identified as needed in Caltrans District 9 Active Transportation Plan (Caltrans 2024).

Caltrans Traffic Census Program identifies five breakpoints along SR-158 beginning at postmile 0.0 at the southern SR-158/US-395 junction, also referred as the June Lake Junction, through postmile 15.836 at the northern SR-158/US-395 junction, also referred to as Grant Lake Junction. During 2022, an average of 1,990 daily drivers headed west onto SR-158 at the southern US-395 junction (postmile 0.0) and an average of 380 daily drivers headed west onto SR-158 at the northern US-395 junction. Refer to Table 8.17-2 for AADT data for each postmile along SR-158.

**Northshore Drive/June Lake Beach Road**

Northshore Drive, also referred to as June Lake Beach Road, is a loop that intersects SR-158 north and south of the town of June Lake and runs along the northwesterly shorelines of June Lake and Gull Lake. Northshore Drive is open year-round and provides an alternate route into and out of the town of June Lake in case of avalanches that may close SR-158 (Mono County 2019). The road also serves to distribute traffic during busy summer months (Mono County 2019). The road is a single lane in each direction with minimal shoulders and no bike lanes or sidewalks. Parking is prohibited on the shoulders of the road. The speed limit is 35 mph. The June Lake Active Transportation Plan proposes adding a Class 2 bike lane with appropriate signage along the road (Mono County 2023), but there is no current project planned. Additionally, Caltrans has identified the need for a pedestrian crossing on the northern intersection of SR-158 and Northshore Drive (Caltrans 2024).

### 8.17.2.2 Local Traffic Patterns and Safety

Mono County adopted an updated RTP in 2019. The RTP addresses existing conditions and long-term needs and goals for transportation systems in the county. According to the RTP, many residents in the town of June Lake commute to the Town of Mammoth Lakes and to the City of Bishop for work via US-395. Due to the high number of people who work outside the community in which they live, the RTP notes there are opportunities for ridesharing including in the town of June Lake (Mono County 2019).

## United States Route 395

US-395 is part of the National Truck Network and the RTP discusses safety concerns associated with increasing truck traffic on the highway. Safety concerns identified include the impact of oversized trucks on the safety and capacity of two-lane highway sections and the lack of paved shoulders and adequate sight distances. Narrow shoulders are a concern if vehicles must pull over for emergencies. The RTP states that the widening to four lanes of US-395 to Lee Vining has mitigated some safety issues.

## State Route 158

According to the RTP, SR-158 experiences traffic congestion during peak periods in the winter and summer, particularly around the town of June Lake and on SR-158 south of the town of June Lake. Winter travel congestion is sometimes further exacerbated by winter weather conditions. Caltrans reports that the rate of accidents along SR-158 in the town of June Lake exceeds the statewide average for similar highways (Mono County 2019).

AADT volumes along SR-158 show a general increase over the past decade. The RTP recorded an AADT of 1,500 vehicles heading west on SR-158 from the southern US-395 junction in the year 2014 and 1,900 vehicles in 2017. As discussed above, an average of 1,990 daily drivers headed west on SR-158 from the southern US-395 junction in 2022. Options identified in the RTP to address operational and safety concerns associated with increasing traffic along the route include easing congestion in the town of June Lake by providing alternate travel routes; providing for alternatives modes of transportation to the automobile; and providing safer routes for non-motorized forms of transportation. The widening of SR-158 to reduce traffic congestion is unattainable due to the steep slopes, sensitive environmental habitats, and a limited right of way (Mono County 2019).

### 8.17.2.3 Public Transportation/Transit

Transit services in the county currently include interregional and countywide services provided by the Eastern Sierra Transit Authority (ESTA) and the Yosemite Area Regional Transportation System (YARTS).

ESTA is a new public transit agency created to meet the growing need for public transportation of its four member jurisdictions and throughout the entire Eastern Sierra region. ESTA offers a variety of bus services, including deviated fixed routes, local in-town dial-a-ride services, multiple town-to-town services throughout the US-395 corridor (ESTA 2024). The three closest ESTA stops along US-395 in the vicinity of the Project are in the town of Lee Vining, at the southern SR-158/US-395 junction (June Lake Junction), and in the Town of Mammoth Lakes. The southern SR-158/US-395 junction requires a 24-hour advance notice for pickup.

During the summer, YARTS provides service to and from the Town of Mammoth Lakes in Mono County (and locations in Mariposa and Merced counties) on a schedule that connects with the Yosemite National Park free shuttle service (Mono County 2019). YARTS offers a stop at the southern SR-158/US-395 junction. This stop is completed by request only.

### 8.17.3 References

Caltrans (California Department of Transportation). 2022. Traffic Census Program. Available online at: https://dot.ca.gov/programs/traffic-operations/census. Accessed April 2024.

———. 2024. Caltrans District 9 Active Transportation Plan Story Map. Available online at: https://storymaps.arcgis.com/stories/7e38bd88072c4640b6c4d0592772f57e. Accessed April 2024.

ESTA (Eastern Sierra Transit Authority). 2024. About Eastern Sierra Transit. Available online at: https://www.estransit.com/. Accessed April 2024.

FHWA (Federal Highway Administration). 2023. Federal Highway Administration an Overview for our Stakeholders. Available online at: https://highways.dot.gov/sites/fhwa.dot.gov/files/2024-02/overview-for-our-stakeholders.pdf. Accessed April 2024.

Mono County. 2019. Mono County General Plan – Regional Transportation Plan. Available at: https://www.monocounty.ca.gov/planning/page/general-plan.

———. 2023. June Lake Loop Active Transportation Plan. Available online at: https://monocounty.ca.gov/planning/page/june-lake-active-transportation-plan#:~:text=The%20June%20Lake%20Active%20Transportation,and%20establish%20priorities%20and%20cost. Accessed April 2024.

YARTS (Yosemite Area Regional Transportation System). 2024. YARTS Transit to Yosemite. Available online at: https://yarts.com/. Accessed April 2024.

# TABLES

### Table 8.17-1. 2022 Caltrans Annual Average Daily Traffic Data: US-395 from the SR-203 Junction to the Lee Vining Visitor Center

| Postmile | Location Description | Back AADT (South of Location) | Ahead AADT (North of Location) |
|---|---|---|---|
| 25.750 | JCT. RTE. 203 WEST | 10,200 | 5,300 |
| 28.285 | JCT. RTE. 299 EAST | 1,700 | 890 |
| 29.640 | JCT. RTE. 14 SOUTH | 3,800 | 5,700 |
| 29.840 | GARNIER ROAD | 6,200 | 4,750 |
| 34.674 | JCT. RTE. 190 EAST | 7,300 | 7,350 |
| 36.824 | KERN/INYO COUNTY LINE | 5,700 | -- |
| 40.336 | SOUTH JCT. RTE. 158 | 4,900 | 4,540 |
| 45.948 | TWENTY MULE TEAM RD | 8,000 | 5,200 |
| 50.744 | TIOGA PASS JUNCTION, NORTH JCT. RTE. 120 WEST | 4,730 | 4,100 |
| 51.690 | LEE VINING VISITORS CENTER | 3,600 | 4,300 |

*Source: Caltrans 2022*

Key: AADT = Annual Average Daily Traffic

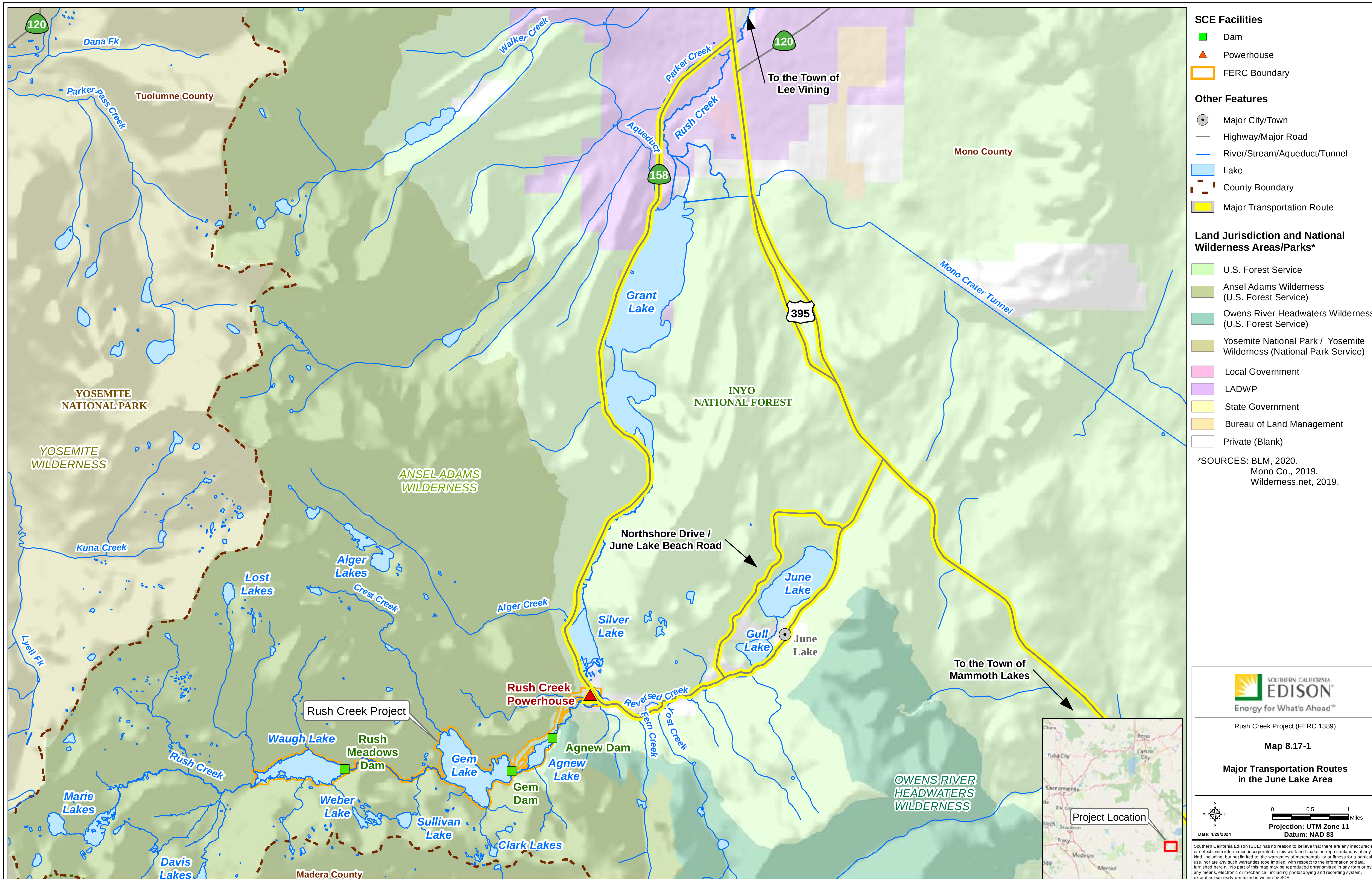
### Table 8.17-2. 2022 Caltrans Annual Average Daily Traffic Data: SR-158 from the June Lake Junction to the Grant Lake Junction

| Postmile | Location Description | Back AADT (South of Location) | Ahead AADT (North of Location) |
|---|---|---|---|
| 0.000 | JUNE LAKE JUNCTION, SOUTH JCT. RTE. 395 | -- | 1900 |
| 2.822 | LAKEVIEW DRIVE | 1,500 | 1,500 |
| 3.860 | NORTH SHORE DRIVE | 1,600 | 1,400 |
| 7.180 | SILVER LAKE CAMPGROUND | 1,450 | 550 |
| 15.836 | GRANT LAKE JUNCTION, NORTH JCT. RTE. 395 | 390 | -- |

*Source: Caltrans 2022*

Key: AADT = Annual Average Daily Traffic

# MAPS




C:\GIS\237800343\map\Rush Creek\LandMaps\SCE_RUSH_CREEK_MajTranspRoutes_17i11i_01.mxd

## TABLE OF CONTENTS

Page

**9.0 Environmental Effects ........................................................................ 9-1**

9.1 Introduction ........................................................................................ 9-1

## LIST OF ACRONYMS

FERC Federal Energy Regulatory Commission

# 9.0 ENVIRONMENTAL EFFECTS

## 9.1 INTRODUCTION

This section follows the Federal Energy Regulatory Commission's (FERC) content requirements at Title 18 of the Code of Federal Regulations § 5.18(b)(5)(ii)(B), which specify that "the applicant must present the results of its studies conducted under the approved study plan by resource area and use the data generated by the studies to evaluate the beneficial and adverse environmental effects of its proposed project. This section must also include, if applicable, a description of any anticipated continuing environmental impacts of continued operation of the project, and the incremental impact of proposed new development of projects works or changes in project operation. This analysis must be based on the information filed in the Pre-Application Document provided for in § 5.6, developed under the applicant's approved study plan, and other appropriate information, and otherwise developed or obtained by the Applicant." In addition, as required under § 5.18(b), this section follows the Commission's "Preparing Environmental Documents: Guidelines for Applicants, Contractors, and Staff."

This environmental analysis is based on information included in Southern California Edison Company's Pre-Application Document for the Rush Creek Project; Section 8.0, Affected Environment of the License Application; and Draft Technical Study Reports[1] included in Supporting Document A of this License Application. A description of the modeling conducted for the Project is included in the AQ 1 – Instream Flow Technical Study Report and AQ 2 – Hydrology Technical Study Report, which are included in Supporting Document A of this License Application.

Section 9.2, Construction Effects (temporary effects) and Section 9.3, Continued Operation and Maintenance (long-term effects), include an analysis (by resource area) of the potential environmental effects of implementing the Proposed Action. Potential effects are determined by analyzing the changes in a resource that may result from activities to be implemented under the Proposed Action (Section 5) compared to the No-Action Alternative (Section 4), which represents the existing condition or baseline environmental conditions.[2] The effects determination included for each resource area considers construction measures (Section 5, Appendix 5-B) and environmental measures, management and monitoring plans (Section 5, Appendix 5-C) included under the Proposed Action. The following effects determinations are used in the analysis:

- **No Effect** – Implementation of the Proposed Action will protect and maintain a resource.

[1] Several studies include components that are being completed in 2024. Results of these studies will be provided in updated technical study reports and the Exhibit E analysis will be revised, as appropriate, in the Final License Application.

[2] The baseline environmental conditions are those that would exist for each resource area if the Project continued to be operated and maintained according to the current FERC license.

- **Negligible Effect** – Implementation of the Proposed Action will have a negligible effect on a resource, or the implementation of environmental measures will reduce the effect to a negligible level.

- **Adverse Effect** – Implementation of the Proposed Action will have a significant effect on a resource that may be reduced, but not to a negligible level, through implementation of new environmental measures.

- **Beneficial Effect (Enhancement)** – Implementation of the Proposed Action will benefit the resource.

## Table of Contents

Page

9.2 Construction Effects ........ 9.2.1-1
9.2.1 Water Use and Hydrology – Construction Effects ........ 9.2.1-1
9.2.1.1 Changes in Hydrology Affecting Minimum Instream Flows ........ 9.2.1-1
9.2.1.2 Changes in Hydrology Affecting High Flows ........ 9.2.1-4
9.2.1.3 Changes in Hydrology Affecting Power Generation ........ 9.2.1-5
9.2.1.4 Removal of Reservoir Gaging Stations ........ 9.2.1-6
9.2.1.5 Changes in Basin Plan Beneficial Uses ........ 9.2.1-6
9.2.1.6 Construction Measures ........ 9.2.1-6
9.2.1.7 Unavoidable Adverse Effects ........ 9.2.1-6
9.2.1.8 References ........ 9.2.1-7

## List of Figures

Figure 9.2.1-1. Modeled Gem Lake Storage under the Proposed Action and No-Action Alternative during Construction (June–September, WY 1990–2022) ........ 9.2.1-9

Figure 9.2.1-2. Modeled Gem Lake Storage under the Proposed Action and No-Action Alternative during Construction (October–January, WY 1990–2022) ........ 9.2.1-10

Figure 9.2.1-3. Modeled Gem Lake Storage under the Proposed Action and No-Action Alternative during Construction (February–May, WY 1990–2022) ........ 9.2.1-11

Figure 9.2.1-4. Modeled Rush Creek Power Generation Flows under the Proposed Action and No-Action Alternative during Construction (June–September, WY 1990–2022) ........ 9.2.1-12

Figure 9.2.1-5. Modeled Rush Creek Power Generation Flows under the Proposed Action and No-Action Alternative during Construction (October–January, WY 1990–2022) ........ 9.2.1-13

Figure 9.2.1-6. Modeled Rush Creek Power Generation Flows under the Proposed Action and No-Action Alternative during Construction (February–May, WY 1990–2022) ........ 9.2.1-14

## LIST OF ACRONYMS

| | |
|---|---|
| ac-ft | acre-feet |
| cfs | cubic feet per second |
| FERC | Federal Energy Regulatory Commission |
| PMF | probable maximum flood |
| Project | Rush Creek Project |
| SCE | Southern California Edison Company |
| USGS | United States Geological Survey |

## 9.2 CONSTRUCTION EFFECTS

### 9.2.1 Water Use and Hydrology – Construction Effects

This section describes the potential construction-related effects to water use and hydrology that could occur due to Project facility modifications implemented under the Proposed Action for Southern California Edison Company's (SCE) Rush Creek Project (Project). A description of Project facility modifications, including restoration activities, to be implemented under the Proposed Action is included in Section 5 and Appendix 5-A.

Potential effects are determined by analyzing the changes in water use and hydrology that may result from activities to be implemented under the Proposed Action compared to the No-Action Alternative (existing condition) (Section 4). Final effects determinations consider construction measures included to avoid or mitigate impacts associated with construction activities (refer to Section 5, Appendix 5-B). Unavoidable adverse effects are discussed at the end of this section.

The following potential effects to water use and hydrology resulting from Project facility modifications were evaluated:

- Changes in hydrology affecting minimum instream flows
- Changes in hydrology affecting high flows
- Changes in hydrology affecting power generation
- Removal of reservoir gaging stations
- Changes in Basin Plan beneficial uses

#### 9.2.1.1 Changes in Hydrology Affecting Minimum Instream Flows

Under the Proposed Action, Rush Meadows and Agnew dams would be removed and Gem Dam would be retrofitted to facilitate compliance with the seismic restrictions under a probable maximum flood (PMF) event (8,700 cubic feet per second [cfs]) with a new spillway and reduced dam height. Project facility modifications would require dewatering of construction sites and installation of a bypass system to direct Rush Creek flows around the work areas allowing minimum instream flows to be maintained.

It is anticipated that removal of Rush Meadows and Agnew dams would each require one construction season and retrofitting of Gem Dam would require three construction seasons. The construction season would extend from approximately June 1 to October 31, depending on weather and snow conditions. Construction activities would be sequenced such that construction would only occur at one site at a time.

The existing Project license includes United States Forest Service Section 4(e) Condition No. 5, Minimum Streamflow Requirement, which states:

> During the operation of the facilities authorized by this license, the Licensee shall maintain each year between Waugh and Gem Lakes, a continuous, minimum flow of 10 cfs or the natural flow into Waugh Lake, whichever is less. Said flow shall be measured immediately below Waugh dam (aka "Rush Meadows Dam"). The Licensee shall also maintain each year in those reaches of Rush Creek between Gem Lake and Agnew Lake, and immediately below Agnew Lake dam, a continuous minimum flow of 1 cfs, or natural flows when the level of the either Gem or Agnew Lake falls below the level of the face of each respective dam.

Minimum instream flows under the Proposed Action, include a continuous minimum flow of 1 cfs (or natural inflow if the level of Gem Lake falls below the face of the dam) in Rush Creek below Gem Dam (United States Geological Survey [USGS] Gage 10287281; SCE 352 R) and 1 cfs (or natural inflow if the level of Gem Lake falls below the face of the dam) below Agnew Lake (natural lake) at the flume gage (USGS 10287289; SCE 357). Refer to Appendix 5-C for a description of the Minimum Instream Flow Measure.

Under existing conditions, South Rush Creek, which splits off Rush Creek below Agnew Lake takes approximately 10 percent of the water from Rush Creek at the channel junction just downstream of Horsetail Falls. During the low-flow season, surface flow in South Rush Creek is typically ≤0.1 cfs. Under the Proposed Action, low-flow conditions would remain the same as existing conditions in South Rush Creek.

Provided below is a description of dewatering at Rush Meadows and Agnew construction sites and a description of how minimum instream flows would be maintained below Gem Dam and Agnew Lake during construction.

**Rush Meadows Dam Removal**

Since 2012, as required by the Federal Energy Regulatory Commission (FERC), Waugh Lake has been limited to a maximum water surface elevation of 9,392.1 feet to meet seismic restrictions and alleviate safety concerns. The spillway was notched in 2018 to help facilitate compliance with the FERC-mandated reservoir elevation restrictions. Currently, Waugh Lake is not operated for storage, rather the low-level outlets on Rush Meadows Dam are left open so that inflow passes through the reservoir. During spring high flows, temporary storage occurs in the lake when the inflows exceed the capacity of the low-level outlets and the notched spillway.

Under the Proposed Action, SCE would remove Rush Meadows Dam such that it can pass the PMF (approximately 6,500 cfs) and no longer impound water (dam abutments would remain). SCE would also restore the former lakebed. Prior to construction low-level outlets would be opened and the reservoir would be drained. Following dewatering, a bypass system would be installed to ensure inflows to the reservoir would continually bypass the dam and enter Rush Creek downstream of the construction site. Detailed information about the bypass system will be included in the Dewatering and Diversion Plan to be developed prior to construction (Appendix 5-B). The system would include:

- Inserting a bypass pipe through the low-level outlet (extending approximately 100 to 200 feet upstream and downstream of the dam).

- Constructing a small cofferdam consisting of super sacks and/or sandbags at the upstream end of the pipe to direct water from the reservoir into the bypass pipe.

During construction, natural flows would bypass the dam into Rush Creek as they currently do under the No-Action Alternative. The Dewatering and Diversion Plan will include an approach for transitioning from low-level outlet flows to bypass pipe flows (and vice versa) that ensures continuous flow into Rush Creek downstream of the dam during construction. Following removal of Rush Meadows Dam, natural hydrology would pass downstream.

**Agnew Dam Removal**

As originally designed, Agnew Dam impounded Agnew Lake, a 40-acre reservoir with a storage capacity of 810 acre-feet (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. In 2017, two rectangular notches were cut in Agnew to allow the reservoir to pass high flows downstream to facilitate compliance with the FERC-mandated reservoir elevation restrictions. Under existing conditions, Agnew Lake no longer stores water or diverts water for power generation. Water entering the lake passes through the two notches in the bottom of the dam and flows into Rush Creek.

Under the Proposed Action, SCE would remove Agnew Dam such that it can pass the PMF (approximately 8,400 cfs) and no longer impound water (dam abutments would remain). SCE would also restore the former lakebed. During construction inflow to Agnew Lake would be managed by controlling the outflow from Gem Dam. In addition, a bypass system would be installed to ensure inflows from Gem Dam would continually bypass the dam and enter Rush Creek downstream of the construction site. Detailed information about the bypass system will be included in the Dewatering and Diversion Plan to be developed prior to construction (Appendix 5-B). The system would include:

- Inserting a bypass pipe through the low-level outlet (extending upstream and downstream of the dam).

- Constructing a small cofferdam consisting of super sacks and/or sandbags at the upstream end of the pipe to direct water from the reservoir into the bypass pipe.

During construction, the minimum instream flow requirements in Rush Creek below Agnew Lake (natural lake) at the flume gage would be 1 cfs. The Dewatering and Diversion Plan would include methods for transitioning from water passing through the two notches in the bottom of the dam to bypass pipe flows (and vice versa) that ensures continuous flow into Rush Creek downstream of the dam during construction. Minimum flows would continue to be released into Rush Creek downstream of the dam during construction; therefore, there would be no effect on minimum flows.

**Gem Dam Retrofit**

As originally designed and constructed, 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 and alleviate safety concerns, resulting in a 256-acre reservoir with a storage capacity of 10,752 ac-ft.

Under the Proposed Action, Gem Dam would be retrofitted to facilitate compliance with the seismic restrictions under a PMF event (8,700 cfs) with a new spillway and reduced dam height. In addition, the former inundation zone of Gem Dam, prior to the 2012 seismic restrictions, would be revegetated and stabilized, as necessary. After retrofitting of Gem Dam, the current maximum allowable water surface elevation of the lake, 9,027.5 feet, would remain unchanged. Construction includes the following:

- Construction/retrofitting activities would occur primarily from upstream of the dam using a floating barge in a drawn-down reservoir with implementation of appropriate best management practices.
- The reservoir would be drawn down to an elevation of approximately 9,000 feet.
- The reservoir water level during construction would be adjusted by controlling releases from the 36-inch dam low-level outlet, 36-inch bypass valve, and power tunnel intake (48-inch pipe) at Gem Lake Dam and by adjusting Waugh Lake storage and outflow from Rush Meadows Dam.

During construction, the minimum instream flow requirements in Rush Creek below Gem Dam would be 1 cfs, the same as for the No-Action Alternative. Minimum instream flows would be maintained through releases from the low-level outlet. Minimum flows would continue to be released into Rush Creek downstream of the dam during construction; therefore, there would be no effect on minimum flows.

### 9.2.1.2 Changes in Hydrology Affecting High Flows

Under the No-Action Alternative, Waugh Lake temporarily stores water when inflows exceed the capacity of the low-level outlets, which moderates high flows in Rush Creek below Rush Meadows Dam. Under the Proposed Action, Gem Dam would be retrofitted, and Rush Meadows Dam would be removed (Section 9.2.1.1). When Rush Meadows Dam is removed, flows entering Gem Lake would be unimpaired and, therefore, higher during high-flow events. Releases and spills from Gem Dam into Rush Creek could also be higher and/or more frequent under the Proposed Action.

During retrofitting of Gem Dam, Gem Lake storage capacity would be reduced from 10,751 ac-ft of storage to 4,347 ac-ft for three construction seasons (June 1 through October 31). Figures 9.2.1-1 through 9.2.1-3 show monthly exceedance plots of Gem Lake storage during the proposed construction season. This reduced storage could increase the potential for high-flow events in Rush Creek, particularly downstream of Gem Dam (Rush Creek and South Rush Creek above State Route 158 and for Rush Creek above Silver Lake). Refer to Section 9.3.1, Water Use and Hydrology – Operation and Maintenance Effects for additional analysis of increased high flows below Gem Dam during long-term operation of the Project.

Under existing conditions, the amount of water that flows into South Rush Creek at the channel junction just downstream of Horsetail Falls (upstream of State Route 158) varies depending on the flow in Rush Creek. At low flows (<286 cfs) the percentage split into South Rush Creek is approximately 10 percent. At higher flows the percentage split is higher. At 300 cfs in Rush Creek, 65 cfs or 22 percent of the flow enters South Rush Creek. At 400 cfs in Rush Creek, 160 cfs or 40 percent of the flow enters South Rush Creek. Under the Proposed Action, high-flow conditions would remain the same as existing conditions in South Rush Creek.

During construction, the number of days and years with high-flow events could increase compared to the No-Action Alternative (see Section 9.3.1.3). To reduce the potential for high flows resulting from reduced storage at Gem Lake, SCE will develop a Dewatering and Diversion Plan. The plan will include sequencing of reservoir removal such that Gem Dam is retrofitted while Rush Meadows Dam is still in place. This would provide SCE with more options to manage high flows into and out of Gem Lake during the three-year construction period. With implementation of the Dewatering and Diversion Plan during construction, the potential effects of high-flow events in Rush Creek (including South Rush Creek) would be negligible.

### 9.2.1.3 Changes in Hydrology Affecting Power Generation

Power generation during construction would be affected by a temporary decrease in storage capacity in Gem Lake during retrofitting of the dam (maximum 4,347 ac-ft storage instead of 10,751 ac-ft) (Section 9.2.1.2). The decrease in storage would affect the timing and availability of power generation flows. Figures 9.2.1-4 through 9.2.1-6 show monthly exceedance plots of power generation flows during the proposed construction period. When averaged over the whole year, the flow available for power generation during the three years of construction for the Gem Dam retrofitting would be 87 percent of No-Action Alternative power generation flows. This short-term, temporary decrease in power generation flows during construction is considered a negligible effect.

### 9.2.1.4 Removal of Reservoir Gaging Stations

Under the Proposed Action, Rush Meadows Dam and Agnew Dam would be removed such that they no longer impound water (Section 9.2.1.1). The reservoir gages that exist at these locations, under existing conditions, would be removed because they would no longer be necessary for operation and maintenance of the Project, including:

1. Waugh Lake reservoir storage gage (USGS No. 10287260; SCE No. 359)
2. Agnew Lake reservoir storage gage (USGS No. 10287285; SCE No. 351)

Removal of these reservoir gages under the Proposed Action would have no effect on hydrology or on gaging stations required to evaluate minimum instream flows, reservoir storage, or power generation.

### 9.2.1.5 Changes in Basin Plan Beneficial Uses

Beneficial uses that apply to surface waters within the Rush Creek Basin are identified in the Water Quality Control Plan for the Lahontan Region, North and South Basins (Basin Plan) (CRWQCB 2021). Beneficial uses that pertain to upper Rush Creek, above Grant Lake, include: (1) municipal and domestic supply; (2) freshwater replenishment; (3) hydropower generation; (4) water contact recreation; (5) noncontact water recreation; (6) commercial and sport fishing; (7) cold freshwater habitat; (8) wildlife habitat; and (9) spawning, reproduction, and development.

Project facility modifications to be implemented under the Proposed Action would not result in a change in the identified beneficial uses that pertain to Upper Rush Creek, above Grant Lake. Following Project facility modifications, the Project would still store water in Gem Lake, generate hydroelectric power, provide dispersed recreation opportunities, and maintain aquatic and terrestrial wildlife habitat. Therefore, Project facility modifications would maintain beneficial uses in the vicinity of the Project.

### 9.2.1.6 Construction Measures

To avoid or reduce impacts to water use and hydrology during construction, SCE will prepare and implement a Dewatering and Diversion Plan. A complete list of construction measures is included in Section 5, Appendix 5-B.

### 9.2.1.7 Unavoidable Adverse Effects

There are no unavoidable adverse effects to water use and hydrology related to Project facility modifications implemented under the Proposed Action.

### 9.2.1.8 References

CRWQCB (California Regional Water Quality Control Board) Lahontan Region. 2021. Water Quality Control Plan for the Lahontan Region, North and South Basins (Basin Plan). Revised September 2021. Available at: https://www.waterboards.ca.gov/lahontan/water_issues/programs/basin_plan/references.html.

# FIGURES

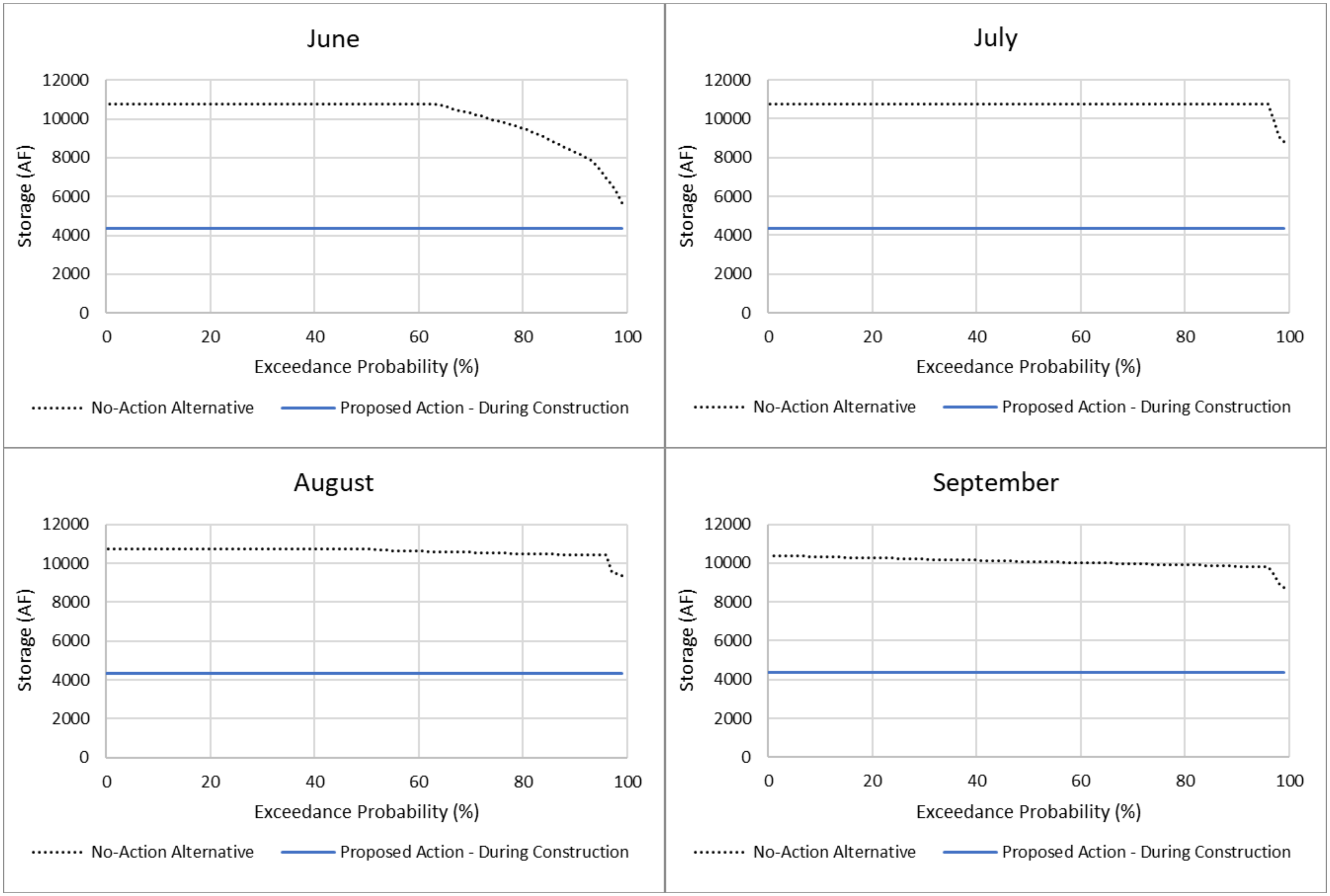



**Figure 9.2.1-1. Modeled Gem Lake Storage under the Proposed Action and No-Action Alternative during Construction (June–September, WY 1990–2022)**

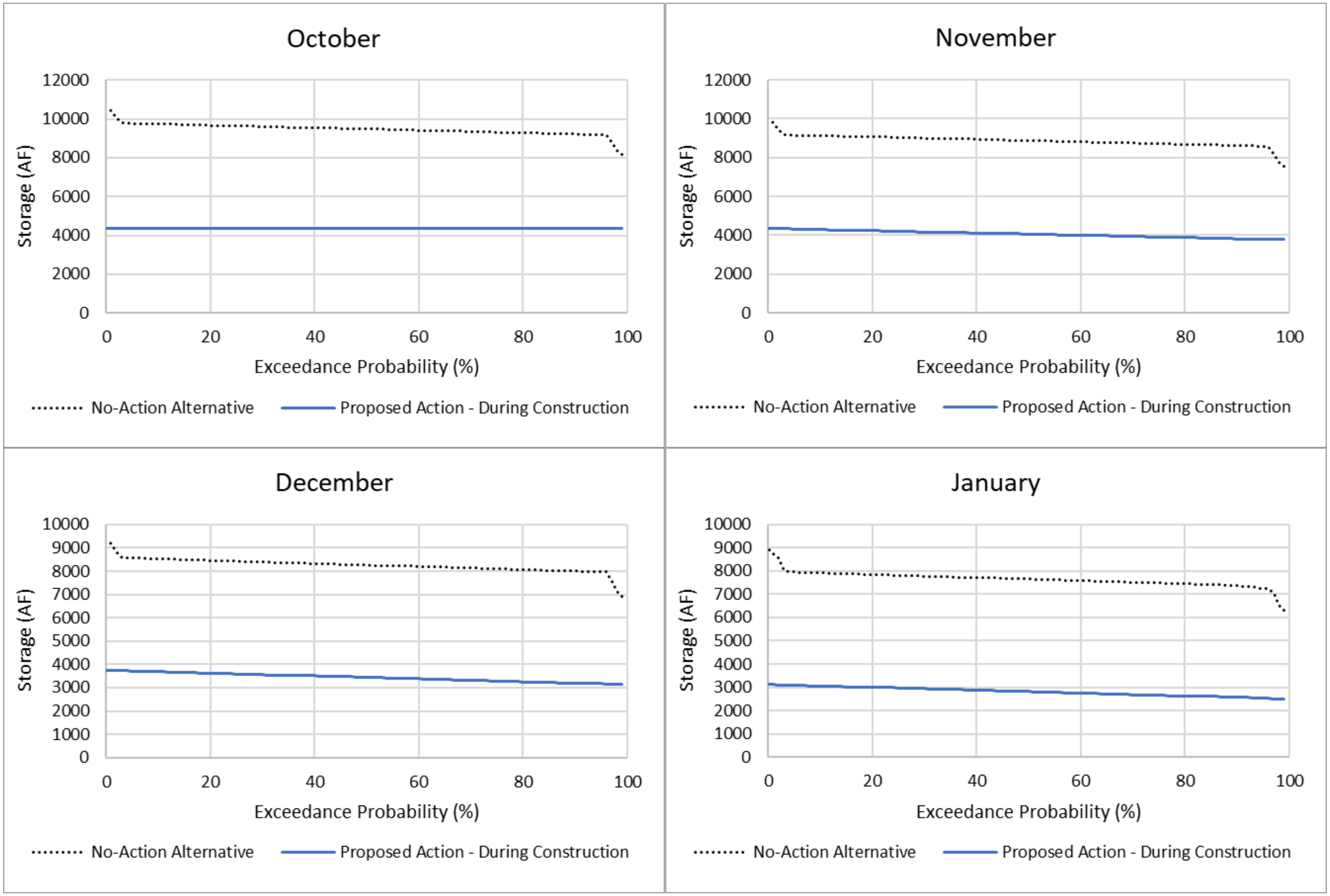



**Figure 9.2.1-2. Modeled Gem Lake Storage under the Proposed Action and No-Action Alternative during Construction (October–January, WY 1990–2022)**

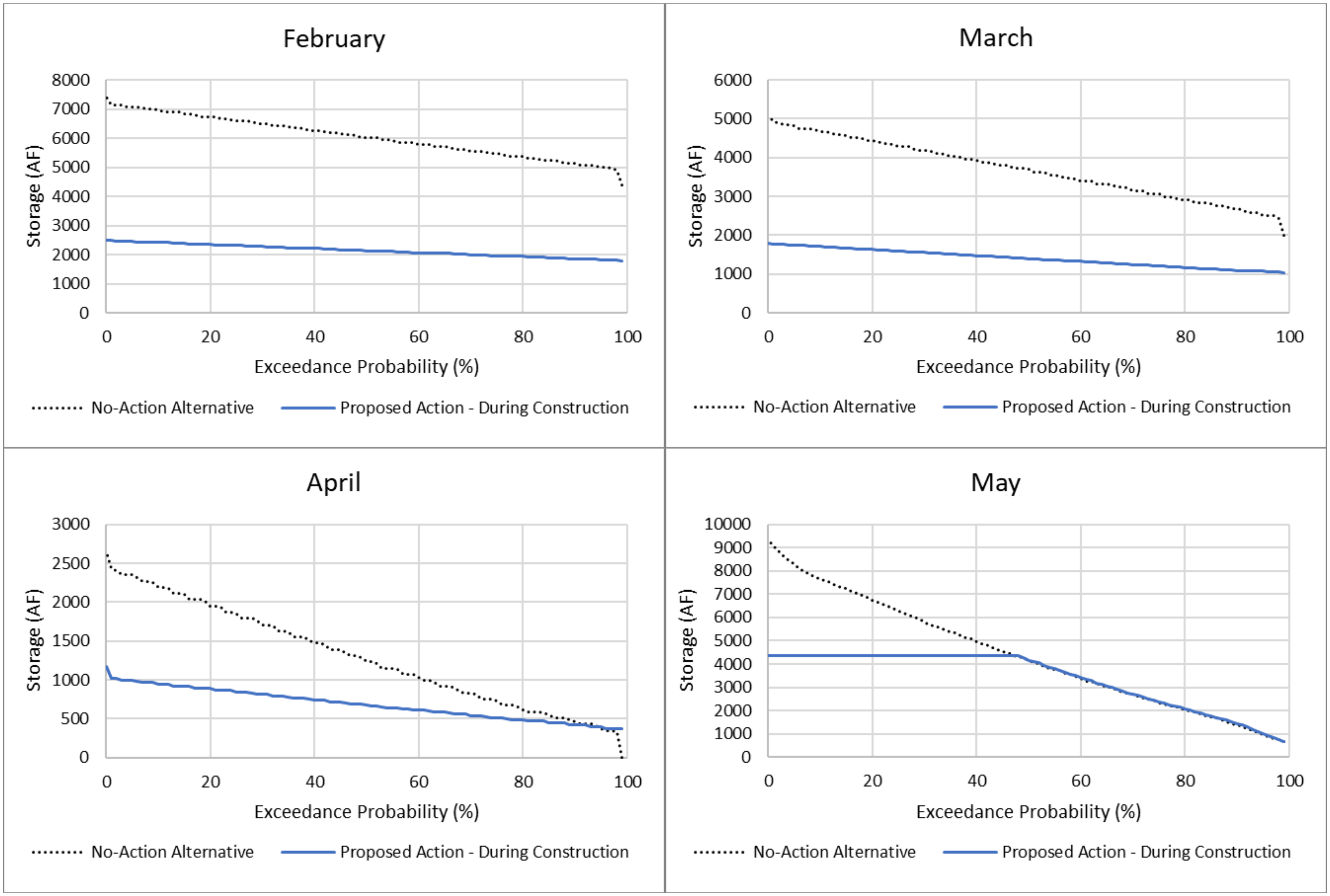



**Figure 9.2.1-3. Modeled Gem Lake Storage under the Proposed Action and No-Action Alternative during Construction (February–May, WY 1990–2022)**

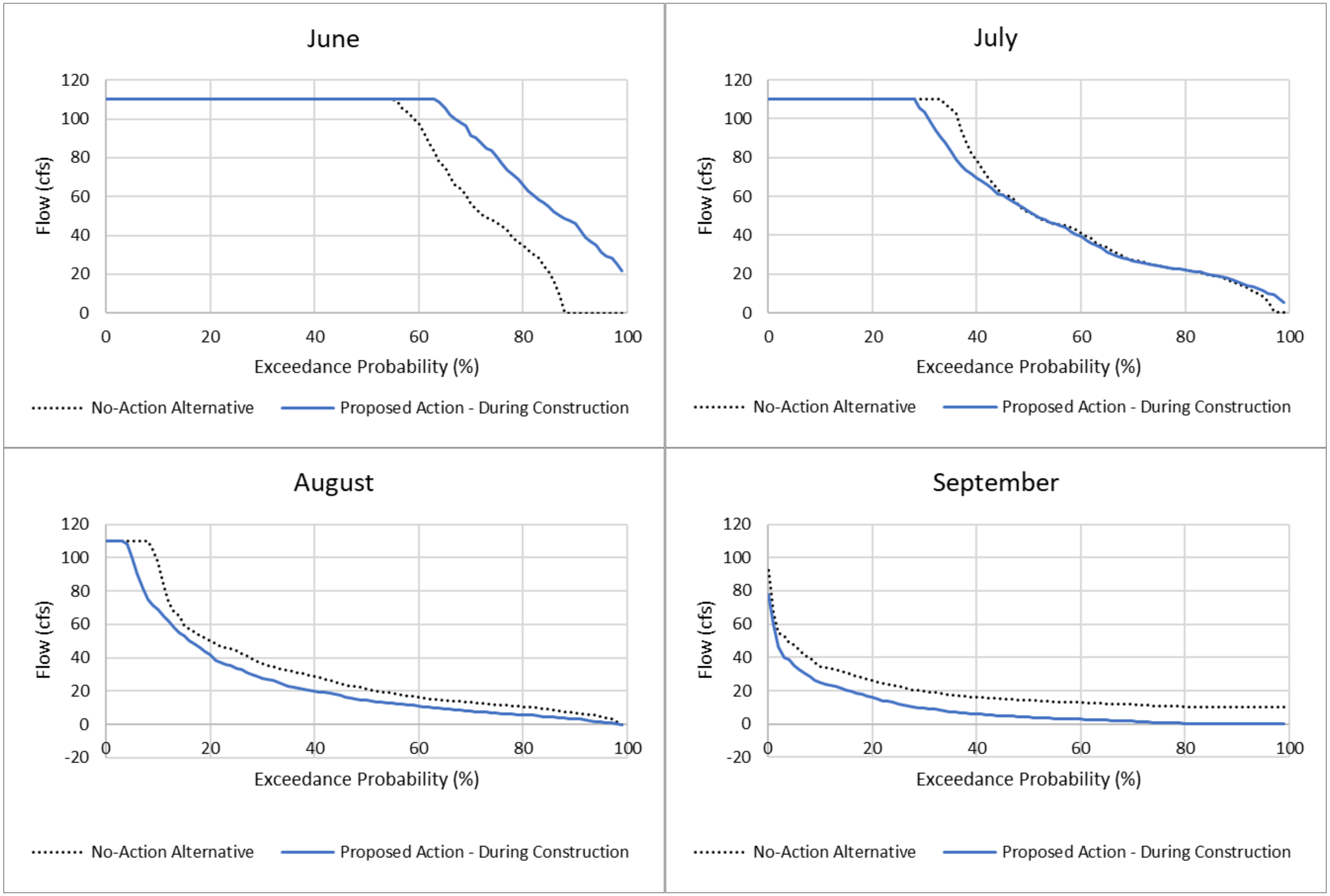



**Figure 9.2.1-4. Modeled Rush Creek Power Generation Flows under the Proposed Action and No-Action Alternative during Construction (June–September, WY 1990–2022)**

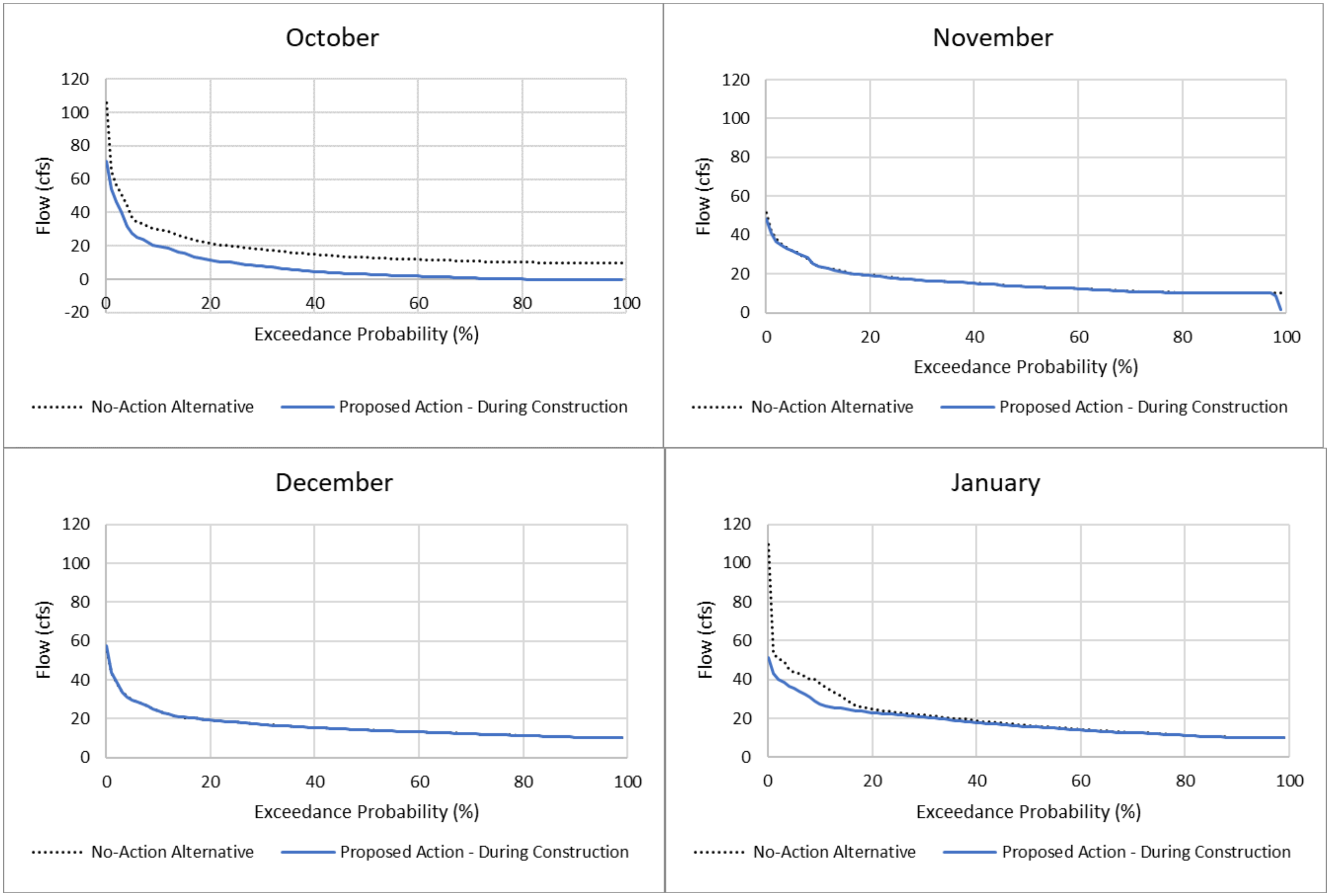



**Figure 9.2.1-5. Modeled Rush Creek Power Generation Flows under the Proposed Action and No-Action Alternative during Construction (October–January, WY 1990–2022)**

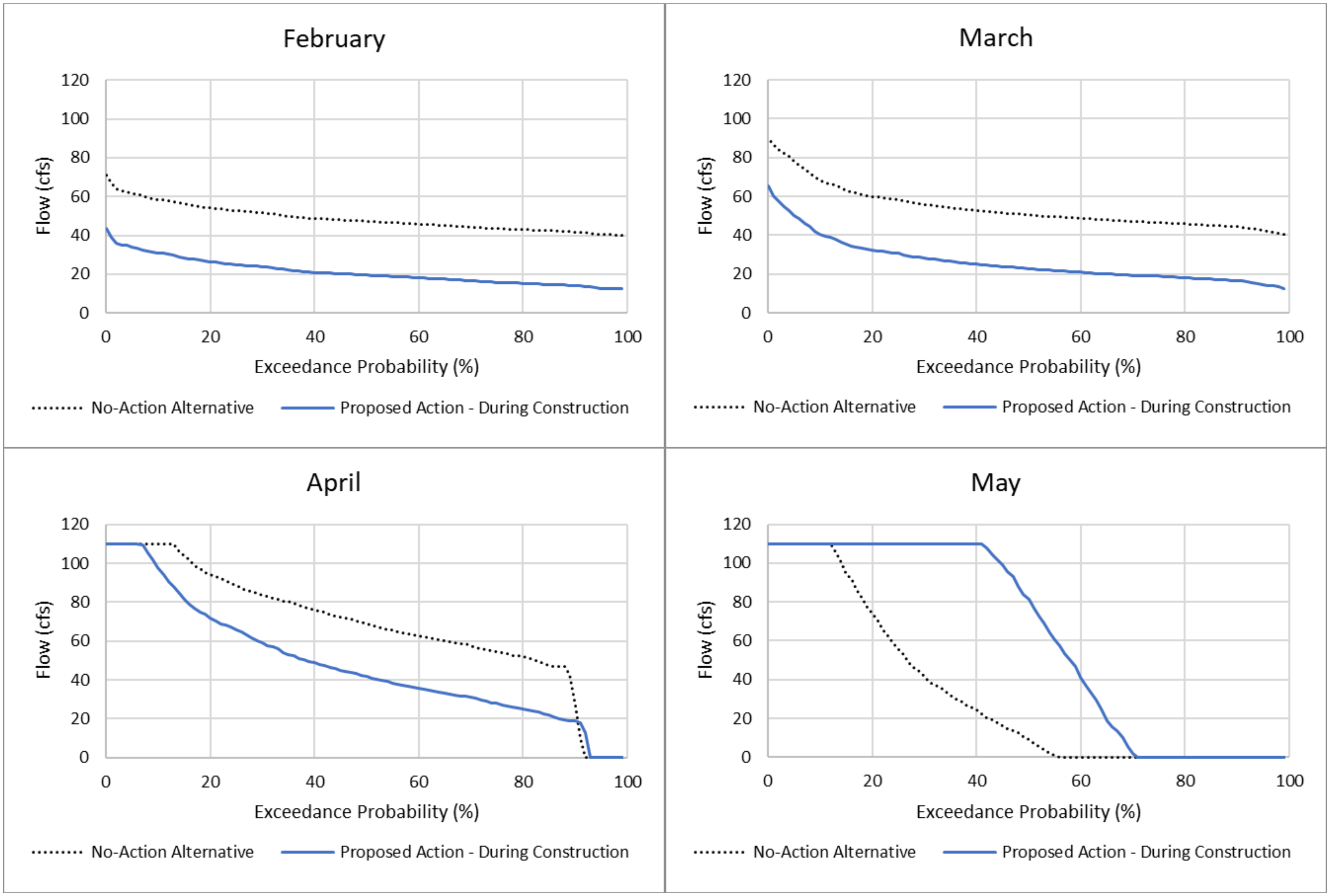



**Figure 9.2.1-6. Modeled Rush Creek Power Generation Flows under the Proposed Action and No-Action Alternative during Construction (February–May, WY 1990–2022)**

## TABLE OF CONTENTS

Page

9.2.2 Water Quality – Construction Effects ........ 9.2.2-1
9.2.2.1 Potential Effects on Water Quality ........ 9.2.2-1
9.2.2.2 Construction Measures ........ 9.2.2-5
9.2.2.3 Unavoidable Adverse Effects ........ 9.2.2-6
9.2.2.4 References ........ 9.2.2-6

## LIST OF ACRONYMS

| | |
|---|---|
| Project | Rush Creek Project |
| SCE | Southern California Edison Company |

### 9.2.2 Water Quality – Construction Effects

This section describes the potential construction-related effects to water quality that could occur because of Project facility modifications to be implemented under the Proposed Action for Southern California Edison Company's (SCE) Rush Creek Project (Project). A description of Project facility modifications, including restoration activities, to be implemented under the Proposed Action is included in Section 5 and Appendix 5-A.

Potential effects are determined by analyzing the changes in water quality that may result from activities to be implemented under the Proposed Action compared to the No-Action Alternative (existing condition) (Section 4). Final effects determinations consider construction measures included to avoid or mitigate impacts associated with construction activities (refer to Section 5, Appendix 5-B). Unavoidable adverse effects are discussed at the end of this section.

The following potential effects to water quality associated with Project facility modifications were evaluated:

- Potential water quality degradation during construction activities.

This section relies on data collected as part of water quality studies conducted in 2023 as part of the AQ 4 – Water Quality Technical Study Plan. In accordance with direction from the Federal Energy Regulatory Commission in its Determination on Requests for Study Modification (FERC 2024), SCE will repeat the 2023 water quality monitoring program in 2024 to identify any potential changes in water quality compared to the wet water year type observed in 2023. Results from 2024 studies will be provided in an updated technical study report to be included in the Final License Application. In addition, this analysis will be updated, as appropriate, in the Final License Application.

#### 9.2.2.1 Potential Effects on Water Quality

Under the Proposed Action, Rush Meadows and Agnew dams would be removed and Gem Dam would be retrofitted to facilitate compliance with the seismic restrictions under a probable maximum flood event with a new spillway and reduced dam height. It is anticipated that removal of Rush Meadows and Agnew dams would each require one construction season and retrofitting of Gem Dam would require three construction seasons. The construction season would extend from approximately June 1 to October 31, depending on weather and snow conditions. Construction activities would be sequenced such that construction would only occur at one site at a time.

Construction activities associated with Project facility modifications have the potential to temporarily impact water quality, including increases in turbidity and suspended solids due to sediment disturbance, introduction of pollutants as a result of accidental spill, contamination associated with stormwater runoff from construction staging and stockpile areas, and contamination associated with mule waste. These impacts are discussed below and further organized by construction site later in the section.

- **Increase in Turbidity and Suspended Solids**: Construction activities may cause a temporary increase in turbidity and suspended solids in Rush Creek due to ground-disturbance from excavation and earthmoving, clearing and grading, dam deconstruction, installation of dewatering systems and creek crossings, bank stabilization around the remaining dam abutments, and stormwater runoff. Erosion and destabilization of soils could also result from use of heavy equipment, personnel, and mule traffic, increasing the susceptibility of movement of soils into Rush Creek.

- **Increase in Pollutant Spill Risk**: Construction activities include the use of a variety of chemicals such as fuels, lubricants, paints, solvents, and construction materials. Improper handling, storage, or accidental spills of these chemicals could result in pollutants entering soil or surface water if not managed correctly. Activities associated with Project facility modifications could increase the potential for accidental spills and pollutants to be introduced into Rush Creek.

- **Contamination from Stormwater Runoff**: Construction activities, including dam removal and retrofitting and establishment of staging and stockpile areas, could temporarily alter natural drainage patterns. Without proper stormwater management practices such as silt fencing, straw/hay bales, or vegetative buffers, runoff from rainfall events could also transport pollutants from the construction site into Rush Creek.

- **Contamination from Mule Waste**: Construction activities include the use of mule teams to transport personnel and equipment to each construction site and mule waste would therefore be present in the vicinity of the Project. Nutrients, such as nitrogen and phosphorus (Kellogg et al. 2014), and bacteria (Derlet 2008) found in mule waste have the potential to be introduced to Rush Creek via runoff.

- **Contamination from Human Waste**: Construction activities include installation of sanitary facilities (e.g., port-a-johns) to support workers in the backcountry. Bacteria, nutrients, and other contaminants from human waste and sanitation systems can enter surface water or groundwater if the system is not properly designed and operated, or if sanitation facilities are not provided.

## Construction Activity Locations

*RUSH MEADOWS DAM*

Construction activities would occur within a work area located upstream and downstream of Rush Meadows Dam. The work area would include staging and stockpile areas, portable sanitary facilities, designated refueling areas, mule staging area, and may include worker housing. A cofferdam (i.e., water bypass system) would be installed upstream of the dam to direct clean water from the former Waugh Lake (i.e., Rush Creek) past the construction area. Downstream of the dam, a temporary bridge would be installed across Rush Creek to facilitate access.

Construction activities at Rush Meadows Dam include demolition of the dam such that only the dam abutments remain and removal of ancillary facilities. Demolished concrete would be used as fill material on the upstream and downstream sides of the remaining left and right abutments of the dam to provide stabilizing support.

Restoration activities in the former Waugh lakebed, include stabilization of areas upstream and downstream of the former dam site to prevent erosion; restoration of the construction work area and areas where ancillary facilities will be removed; revegetation and stabilization of sediment; reestablishment and stabilization of Rush Creek within the former Waugh lakebed; and restoration of the channel, and riparian and wetland vegetation.

Construction activities at Rush Meadows Dam and restoration activities in the former Waugh lakebed have the potential to temporarily impact water quality in the work area and downstream in Rush Creek. Waters may be subject to increases in turbidity, pollutant spill risks, and contamination from stormwater or nutrient and bacterial runoff.

*GEM DAM*

Construction activities would occur within a work area located adjacent to Gem Dam, which would include staging and stockpile areas, portable sanitary facilities, and designated refueling areas. Downstream of the dam, a temporary bridge would be installed across Rush Creek to facilitate access, and worker housing, portable sanitary facilities, and a mule staging area would be established.

Construction/retrofitting activities at Gem Dam would occur primarily from upstream of the dam using a floating barge in a drawn-down reservoir. Construction would be completed using access primarily from the reservoir side to minimize the potential for large pieces of demolished concrete material to fall into the reservoir. A catchment system along the upstream edge of the dam would be used to capture material before it enters the reservoir.

Restoration activities in the former inundation zone of Gem Lake, include restoration of the construction work area and areas where ancillary facilities were removed; revegetation and stabilization of sediment; and reestablishment and stabilization of Rush Creek within the former inundation zone.

Construction activities at Gem Dam and restoration activities in the former inundation zone of Gem Lake have the potential to temporarily impact water quality in the work area and downstream in Rush Creek. Waters may be subject to temporary increases in turbidity, pollutant spill risks, and contamination from stormwater or nutrient and bacterial runoff.

*AGNEW DAM*

Construction activities would occur within a work area located upstream and downstream of Agnew Dam, which would include staging and stockpile areas, portable sanitary facilities, and designated refueling areas. A cofferdam and water bypass system would be installed upstream of the dam to direct clean water from the Agnew Lake (natural lake) past the construction area. Downstream of the dam, a temporary bridge would be installed across Rush Creek to facilitate access and a mule staging area would be established.

Construction activities at Agnew Dam include demolition of the dam such that only the dam abutments remain and removal of the Agnew Dam Flowline. Demolished concrete would be used as fill material on the upstream and downstream sides of the remaining left and right abutments of the dam to provide stabilizing support.

Restoration activities in the former Agnew lakebed, include stabilization of areas upstream and downstream of the former dam site to prevent erosion; restoration of the construction work area and areas where ancillary facilities will be removed; revegetation and stabilization of sediment; and reestablishment and stabilization of Rush Creek within the former Agnew lakebed.

Construction activities at Agnew Dam and restoration activities in the former Agnew Lakebed have the potential to temporarily impact water quality in the work area and downstream in Rush Creek. Waters may be subject to increases in turbidity, pollutant spill risks, and contamination from stormwater or nutrient and bacterial runoff.

*JUNE MOUNTAIN SKI AREA PARKING LOT BASE OF OPERATIONS*

Each construction season, a Base of Operations would be established at the existing, paved June Mountain Ski Area Parking Lot located off State Route 158 near June Lake. The Base of Operations would function as the transportation hub for construction activities and would include project management facilities, helicopter landing site, supporting construction equipment, staging area, stockpile area, designated general parking, and sanitary facilities. The Base of Operations would be used to temporarily store material removed from the construction sites prior to transport to an approved disposal site, and to store construction equipment and materials, including fuel, hazardous materials, and other chemicals. Activities at the Base of Operations have the potential to temporarily impact water quality in nearby waters due to pollutant spills and contamination from stormwater runoff.

*FRONTIER PACK STATION AND MULE USAGE ON RUSH CREEK TRAIL*

Project facility modifications would necessitate the use of mules to carry personnel and equipment from the Rush Creek Trailhead to staging areas at the dam construction sites. Mules are expected to be staged at the Frontier Pack Station, located at the base of the Rush Creek Trailhead (west side of State Route 158 on the north end of Silver Lake). Pack trips using mules would start, as they do currently, at the Rush Creek Trailhead and follow the Rush Creek Trail up to the construction sites. Mule waste at Frontier Pack Station, along Rush Creek Trail, and at the construction site staging areas would be present. Mule use during construction activities has the potential to temporarily impact water quality in nearby waters due to nutrients, such as nitrogen and phosphorus (Kellogg et al. 2014), and bacteria (Derlet 2008) found in mule waste being introduced to Rush Creek via stormwater runoff.

Project facility modifications include hazardous waste, water quality, and erosion control measures that will be implemented at each construction activity location described above. Construction measures include development and implementation of plans (Water Quality Monitoring Plan; Erosion Control Plan; Stormwater Pollution Prevention Plan; Dewatering and Diversion Plan; and Spill Prevention, Control, and Countermeasure Plan) to address construction activities and water quality. The measures also include port-a-johns (with secondary containment) transported to the site by helicopter, and replaced once per week, and manure disposal bins in stock use areas that will be removed and replaced periodically. The measures also include obtaining resource agency and construction permits and following Forest Service water quality best management practices (Forest Service 2012). With implementation of construction measures, Project facility modifications would have a negligible effect on water quality in the vicinity of the construction activities. In the long-term, following construction activities, water quality would be the same as it presently is under the No-Action Alternative.

#### 9.2.2.2 Construction Measures

To avoid or reduce impacts to water quality during construction, SCE will obtain, prepare, and/or implement the following measures. A complete list of construction measures is included in Section 5, Appendix 5-B.

- Water Quality Monitoring Plan
- Erosion Control Plan
- Dewatering and Diversion Plan
- Spill Prevention, Control, and Countermeasure Plan
- Stormwater Pollution Prevention Plan
- Applicable resource agency and construction permits
- Forest Service water quality best management practices

#### 9.2.2.3 Unavoidable Adverse Effects

There are no unavoidable adverse effects to water quality as a result of Project facility modifications to be implemented under the Proposed Action.

#### 9.2.2.4 References

Derlet, R., K. Ali Ger, J. Richards, and J. Carlson. 2008. Risk Factors for Coliform Bacteria in Backcountry Lakes and Streams in the Sierra Nevada Mountains: A 5-Year Study. *Wilderness & Environmental Medicine, 19*(2), 82-90. https://doi.org/10.1580/07-WEME-OR-1511.1.

FERC (Federal Energy Regulatory Commission). 2024. Determination on Requests for Study Modification. February.

Forest Service (United States Forest Service). 2012. National Best Management Practices for Water Quality Management on National Forest System Lands. FS_National_Core_BMPs_April2012_sb.pdf (usda.gov).

Kellog, R., D. Moffitt, and N. Gollehon. 2014. *Estimates of Recoverable and Non-Recoverable Manure Nutrients Based on the Census of Agriculture*. United States Department of Agriculture. https://www.nrcs.usda.gov/sites/default/files/2022-10/ManRpt_KelMofGol_2007_final.pdf.

## TABLE OF CONTENTS

Page

9.2.3 Fish and Aquatics – Construction Effects .... 9.2.3-1
9.2.3.1 Modification of Fish and Aquatic Physical Environment .... 9.2.3-2
9.2.3.2 Direct Loss of Fish and Aquatic Species .... 9.2.3-7
9.2.3.3 Special-Status Aquatic Species .... 9.2.3-8
9.2.3.4 Construction Measures .... 9.2.3-8
9.2.3.5 Unavoidable Adverse Effects .... 9.2.3-9
9.2.3.6 References .... 9.2.3-9

## LIST OF FIGURES

Figure 9.2.3-1. Contour Map of Gem Lake Showing the Construction Drawdown 9,000 Feet Contour Versus the Typical High Summer Storage (9,027.5) .... 9.2.3-12

## LIST OF ACRONYMS

| | |
|---|---|
| °C | degrees Celsius |
| CDFW | California Department of Fish and Wildlife |
| cfs | cubic feet per second |
| ESA | Endangered Species Act |
| LCT | Lahontan cutthroat trout |
| PMF | probable maximum flood |
| Project | Rush Creek Project |
| SCE | Southern California Edison Company |
| TSR | Technical Study Report |

### 9.2.3 Fish and Aquatics – Construction Effects

This section describes the potential construction-related effects to fish and aquatic resources that could occur because of Project facility modifications to be implemented under the Proposed Action for Southern California Edison Company's (SCE) Rush Creek Project (Project). A description of Project facility modifications, including restoration activities, to be implemented under the Proposed Action is included in Section 5 and Appendix 5-A.

Potential effects are determined by analyzing the changes to fish and aquatic resources that may result from activities to be implemented under the Proposed Action compared to the No-Action Alternative (existing condition) (Section 4). Final effects determinations consider construction measures included to avoid or mitigate impacts associated with construction activities (refer to Section 5, Appendix 5-B). Unavoidable adverse effects are discussed at the end of this section.

The following potential effects to fish and aquatic resources associated with Project facility modifications were evaluated:

- Modification of the fish and aquatic physical habitat during construction activities and dewatering
  - Water quality
  - Water temperature
  - Gradient, channel geometry, and riparian vegetation
  - Erosion and sedimentation
  - Hydrology (including dewatering and diversion flow fluctuations)
  - Fish barriers and migration
  - Introduction of invasive species / disease
- Direct loss of fish and aquatic species
- Potential effects to special-status species – Lahontan cutthroat trout

Refer to Section 9.2.4, Botanical and Wildlife – Construction Effects for analysis of potential effects to Sierra Nevada yellow-legged frog and Yosemite toad and their critical habitat.

This section relies on data collected in 2023 and reported in the AQ 1 – Instream Flow Technical Study Report (TSR) (AQ 1 – TSR, SCE 2024a), AQ 2 – Hydrology TSR (AQ 2 – TSR, SCE 2024b), AQ 3 – Water Temperature TSR (AQ 3 – TSR, SCE 2024c), AQ 4 – Water Quality TSR (AQ 4 – TSR, SCE 2024d), and AQ 6 – Fish Population and Barriers

TSR (AQ 6 – TSR, SCE 2024e). Additional water quality and fish population data will be collected in 2024 and provided in updated technical study reports to be included in the Final License Application. This analysis will also be updated, as appropriate in the Final License Application.

#### 9.2.3.1 Modification of Fish and Aquatic Physical Environment

Under the Proposed Action, Rush Meadows and Agnew dams would be removed and Gem Dam would be retrofitted to facilitate compliance with the seismic restrictions under a probable maximum flood (PMF) event with a new spillway and reduced dam height. It is anticipated that removal of Rush Meadows and Agnew dams would each require one construction season and retrofitting of Gem Dam would require three construction seasons. The construction season would extend from approximately June 1 to October 31, depending on weather and snow conditions. Construction activities would be sequenced such that construction would only occur at one site at a time. Facility modification and restoration activities are summarized below.

Modifications to Rush Meadows Dam include:

- Construction of a notch in the center of Rush Meadows Dam, sized to pass the PMF (approximately 6,500 cubic feet per second [cfs]), without water impoundment (Appendix 5-A, Map A-1).

Modifications to Agnew Dam include:

- Demolishing the center three arches of Agnew Dam to pass the PMF (approximately 8,400 cfs) without any water impoundment (Appendix 5-A, Map A-2).

Modifications to Gem Dam include:

- Removal of the upper portions of Arches No. 10 to No. 14 to develop a new ungated ogee spillway to pass the estimated PMF (8,700 cfs) with a crest elevation corresponding to the top of the existing gravity infill section, elevation 9,027.5 feet (consistent with current seismic restrictions) (Appendix 5-A, Map A-3).

Site-specific restoration activities include:

- Stabilization of areas upstream and downstream of the former dam sites (i.e., Rush Meadows and Agnew dams), as appropriate, to prevent erosion.
- Restoration of work areas, staging areas, campsites, and areas where project-support facilities were removed.
- Revegetation and stabilization of sediment in the former Waugh and Agnew lakebeds and former Gem Lake inundation zone, as necessary.

- Reestablishment and stabilization of Rush Creek within the former Waugh and Agnew lakebeds, as necessary.
- Restoration of the channel, and riparian and wetland vegetation in the former Waugh lakebed.

Construction activities have the potential to impact fish and aquatic species (AQ 6 – TSR, SCE 2024e) in the vicinity of the Project. Construction could temporarily affect fish and aquatic species chemical habitat by affecting water quality, including increasing water temperature, increasing turbidity and suspended solids from sediment disturbance, introducing pollutants because of accidental spill or contamination associated with stormwater runoff from construction staging and stockpile areas, and contamination associated with human/mule waste. Construction has the potential to temporarily affect physical habitat by modifying channel geomorphology/sediment and hydrology, including minimum instream flows and channel dewatering, creating barriers to fish movement, and introduction of invasive species and disease. These potential effects are discussed below.

**Water Quality**

Water quality in the vicinity of the Project is discussed in the AQ 4 – TSR (SCE 2024d) and water quality effects related to Project facility modifications are addressed in Section 9.2.2. Work at the construction sites (Rush Meadows Dam, Gem Dam, and Agnew Dam) could potentially result in temporary increases in turbidity due to sediment disturbance, pollutant spill risks, construction debris contamination, and possible contamination from runoff from human/mule waste.

Measures for controlling hazardous waste, water quality, and erosion will be implemented at each construction site to protect fish and aquatic species and their habitat. Construction measures include development and implementation of plans (Water Quality Monitoring Plan; Erosion Control Plan; Stormwater Pollution Prevention Plan; Dewatering and Diversion Plan; and Spill Prevention, Control, and Countermeasure Plan) to protect water quality during construction activities. The measures also include port-a-johns (with secondary containment) replaced once per week, and manure disposal bins in stock use areas that will be removed and replaced periodically. The measures also include obtaining resource agency and construction permits and following Forest Service water quality best management practices. With implementation of construction measures, Project facility modifications would have a negligible effect on water quality related to fish and aquatic species.

**Water Temperature**

Water temperature in the vicinity of the Project is discussed in the AQ 3 – TSR (SCE 2024c). Construction activities, such as dewatering and diversion, have the potential to temporarily affect water temperatures in Rush Creek, which could cause mortality of fish, potentially reduce fish growth, impair reproductive success, and alter the timing of life-history events such as breeding timing and egg incubation (State Water Board 2020, Hamilton et al. 2016). Increased water temperatures can also cause lower dissolved oxygen levels and cause aquatic species to be more susceptible to disease (Wood et al. 2006). Potential effects to water temperature because of construction activities varies by reach type (reservoirs and stream reaches). Potential effects are discussed below.

*PROJECT RESERVOIRS AND SILVER LAKE*

***WAUGH LAKE***

Removal of Rush Meadows Dam would occur during the summer (June 1 through October 31). The water temperature of natural inflow to the dam during the summer of 2023 (existing conditions) was less than approximately 10 degrees Celsius (°C) (AQ 3 – TSR, SCE 2024c). Prior to construction, a Dewatering and Diversion Plan will be developed, that includes specifications for a bypass system that would allow inflows to be routed around the construction site with no modification of flow or water temperature. Water temperature would remain cold, far below the approximate 20°C that could affect rainbow and brook trout. With implementation of the Dewatering and Diversion Plan, there would be no effect to fish / aquatic species water temperature habitat.

***GEM LAKE***

The drawdown of Gem Lake to 9,000 feet during construction would occur during the summer (three seasons). This elevation is within the normal operating range of the reservoir; however, there would be less storage (4,347 acre-feet versus 10,751 acre-feet) in the reservoir than occurs typically in the summer. Natural inflow to the lake would continue and powerhouse / minimum flow releases would continue. Water temperature profiles would likely be similar to those measured in 2023 when water temperature in the epilimnion was less than 15°C (AQ 3 – TSR, SCE 2024c) but there may be a small, temporary increase in epilimnion water temperature due to reduced reservoir volume (e.g., 1–2°C). Because Gem Lake epilimnion water temperature increases are expected to be minimal and because the water temperature is expected to be well below 20°C (suitable for cold water salmonid fishes), the effect on rainbow and brook trout habitat from changes in water temperature in Gem Lake during construction is expected to be negligible.

***AGNEW LAKE***

Agnew Lake would continue at the natural lake level that currently exists and there would be no change to the elevation during removal of Agnew Dam. Inflow and outflow would also remain the same during construction. Water temperature inflow from Rush Creek may be slightly increased (see below). Water temperature in the Agnew Lake epilimnion was less than 14°C in 2023. It is anticipated that the lake epilimnion water temperature would remain below 15°C during construction. In addition, a Dewatering and Diversion Plan will be developed and implemented during construction, that includes a bypass system allowing inflows to be routed around the construction site with no modification of flow or water temperature. Therefore, effects on rainbow and brook trout habitat from changes in water temperature in the natural lake during construction is expected to be negligible.

#### *SILVER LAKE*

Silver Lake is 1.8 miles downstream from the nearest construction site at Agnew Dam. Construction activities would not affect water temperature and thermal habitat conditions for rainbow, brook, and brown trout and Lahontan cutthroat trout or other aquatic species in Silver Lake.

### *STREAM REACHES*

#### *RUSH CREEK – WAUGH LAKEBED TO GEM DAM*

During construction when Waugh Lake has drained (similar to existing conditions) and high flows in Rush Creek have subsided, a cofferdam and flow bypass system would be installed at the Rush Meadows Dam construction site to route Rush Creek water around the construction area and into Rush Creek downstream of the construction site. Dewatering in the construction area has the potential to temporarily result in an increase of water temperature in isolated pools in Rush Creek due to solar heating. Benthic macroinvertebrates and algae would be dewatered and temporarily lost. Water temperature in Rush Creek above and below the construction site would not be affected. To minimize potential effects, prior to construction, a Dewatering and Diversion Plan and Fish Rescue and Relocation Plan will be developed. With implementation of the Fish Rescue and Relocation Plan, rainbow and brook trout within the construction site would be relocated downstream and construction activities would have a negligible effect on individuals. In addition, implementation of the Dewatering and Diversion Plan would maintain water temperature for fish habitat. Benthic macroinvertebrates and algae would be temporarily lost due to dewatering but would recolonize the area following construction and during restoration activities at the site (organisms upstream of the site would recolonize via normal downstream drift). Therefore, construction activities would have a negligible effect on fish (rainbow and brook) and other aquatic species' water temperature habitat.

#### *RUSH CREEK – GEM DAM TO GRANT LAKE*

The drawdown of Gem Lake to 9,000 feet during construction could slightly increase epilimnion water temperature (see above) and instream flow release temperatures into Rush Creek below the dam. The minimum instream flow release elevation would continue to be from the bottom of the dam (approximately 8,985 feet), which released water less than 14°C during the summer of 2023 (minimum flows are 1 cfs). Due to the unique natural lake bathymetry, the minimum flow release is typically within the epilimnion (see water temperature profiles in AQ 3 – TSR, SCE 2024c; Figure 1). Because the epilimnion temperature could increase 1-2°C, the outflow water temperature could also increase 1–2°C. It is anticipated; however, the release water temperature would be well below 20°C. For example, the warmest average daily water temperature in Rush Creek below Agnew Dam during mid-summer 2022 and 2023 (during the lowest flow season) (Rush Creek RM 17.15) was less than 16°C (AQ 3 – TSR, SCE 2024c). On the valley floor, Rush Creek combines with Rush Creek Powerhouse flows, Reverse Creek, and other unnamed tributaries, which combined have a much greater flow volume than the minimum flow release from Gem Dam. Any small increase in water temperature release from Gem Dam, would have a temporary and minor effect on Rush Creek water temperature downstream of the Rush Creek Powerhouse to Grant Lake. Because water temperature is expected to be well within the range suitable for trout, construction activities would have a negligible effect on fish (rainbow, brook, and brown trout and Lahontan cutthroat trout) and other aquatic species' water temperature habitat.

**Gradient, Channel Geometry, and Riparian Vegetation**

Construction activities could result in changes to channel gradient, geometry, or riparian vegetation that provide physical habitat for fish and aquatic species. Project construction (including construction site access) has the potential to impact local channel gradient/geometry via modification of the channel (reestablishment of Rush Creek in Waugh Lake) and affects to riparian vegetation from removal or trimming. Modification of channel gradient, geometry and riparian vegetation would benefit fish and aquatic species over the long term with implementation of site-specific restoration plans and reestablishment of natural hydrology in Waugh Lake and Rush Creek downstream of Rush Meadows Dam. With implementation of site-specific restoration plans and construction measures (e.g., flagging of riparian vegetation for avoidance, compliance with resource agency permit conditions), there would be an overall benefit to physical habitat for fish and aquatic species. Ultimately, removal of the dam and restoration of the former lakebed would result in the restoration of 1.5 miles of high-quality stream habitat and restoration of fish and benthic macroinvertebrates and algae populations. For additional detail on construction effects to riparian vegetation, see Section 9.2.7, Wetland, Riparian, and Littoral Habitats.

**Erosion and Sedimentation**

Erosion and sedimentation during construction can impact fish and aquatic species through modified water quality and physical habitat. In the absence of appropriate protection and avoidance measures, sedimentation could smother fish redds and benthic aquatic species (macroinvertebrates and algae). Changes to sediment supply deposition during construction are addressed in Section 9.2.6, Geomorphology. With implementation of the site-specific restoration plans and construction measures including, Water Quality Monitoring Plan; Erosion Control Plan; Dewatering and Diversion Plan; Stormwater Pollution Prevention Plan; Riparian Measures, Forest Service best management practices, and compliance with resource agency permit conditions, construction activities would have a negligible effect on fish and aquatic species habitat from erosion and sedimentation.

**Hydrology and Instream Flow Habitat**

Without appropriate protection and avoidance measures, potential disruption of minimum instream flows or high-flow events could impact fish and aquatic species habitat. Hydrology, including minimum instream flows and high flows during Project facility modifications is addressed in detail in Section 9.2.1, Water Use and Hydrology and the AQ 2 – TSR (SCE 2024b). With implementation of the Dewatering and Diversion Plan, minimum instream flows would be maintained throughout construction, therefore, construction activities would have a negligible effect on fish and aquatic species habitat.

**Fish Barriers and Migration**

Fish in the vicinity of the construction activities are resident rainbow and brook trout (AQ 6 – TSR, SCE 2024e). Spring or fall spawning movements of adult rainbow and brook trout, respectively, and downstream movement of young-of-the-year fish could be blocked temporarily by construction. Construction activities are at facilities that already, under existing conditions, create upstream migration barriers (Rush Meadows and Gem dams and the bedrock bench at Agnew Dam). Any upstream construction barriers would be analogous to the existing presence of the dams. Downstream movement of fish would also be similar to existing conditions. A Dewatering and Diversion Plan will be developed and implemented during construction, which will include a bypass system at Rush Meadows Dam and Agnew Dam that would maintain downstream passage at the existing facilities (low-level outlet at Rush Meadows Dam and the two notches in the base of Agnew Dam) during construction. Similarly, at Gem Dam reservoir spills and/or the low-level outlets (flow releases and powerhouse flowline) would remain the same as existing conditions during construction. Therefore, construction activities would have no effect on fish barriers and migration.

**Invasive Species / Disease**

Invasive aquatic species that could impact the fish and aquatic community could be introduced into the Project area by construction equipment during Project facility modifications. Adherence to all issued permit conditions, implementation of water quality best management practices such as cleaning all construction equipment prior to entering the watershed and following current state aquatic invasive species decontamination protocols (CDFW 2022) would prevent introduction of disease or invasive aquatic species into the Project area and effects to fish and aquatics species are considered negligible.

#### 9.2.3.2 Direct Loss of Fish and Aquatic Species

Construction activities at Rush Meadows and Agnew dams include installation of a bypass system to divert flows around the construction sites and into Rush Creek downstream of the dams. During installation of cofferdams and the bypass system, and site dewatering, direct loss of individual fish (rainbow and brook trout) could occur if they were present in the dewatered areas or became entrained in dewatering pipes or diversion pumps. Detailed information about the bypass system will be included in a Dewatering and Diversion Plan to be developed prior to construction. The Dewatering and Diversion Plan will ensure flows downstream of the construction site are maintained and that appropriately sized fish screens are used on diversion pipes/pumps to prevent entrainment.

In addition, a Fish Rescue and Relocation Plan will be developed to ensure fish are removed from construction/restoration sites prior to and/or during dewatering using seines and electrofishing gear and safely transported downstream of the construction sites and relocated in Rush Creek. Similarly, during restoration activities in the former Waugh and Agnew lakebeds, fish will be captured and relocated downstream of the restoration areas.

During construction and dewatering, the benthic aquatic community (macroinvertebrates and algae) would be temporarily lost within the construction/restoration areas; however, rapid recolonization would occur after construction/restoration from downstream drift of organisms.

With implementation of the Dewatering and Diversion Plan and Fish Rescue and Relocation Plan, construction activities would have a negligible effect on fish and aquatic species.

#### 9.2.3.3 Special-Status Aquatic Species

Lahontan cutthroat trout (LCT), a special-status aquatic species is present in the vicinity of the Project. LCT were listed as endangered under the federal Endangered Species Act (ESA) on October 13, 1970 (35 FR16047 16048), and downlisted to threatened on July 16, 1975 (40 FR 29863 29864) with a section 4(d) rule that allows resident species of fish or wildlife to be taken in accordance with state law pursuant to section 6(c) of the ESA. Consequently, LCT have played an important role in recreational fishing in Nevada, California, and Oregon. They are raised in state, federal and Tribal hatcheries for both recovery and recreational fishing purposes. LCT are stocked annually by California Department of Fish and Wildlife (CDFW) in Silver Lake. During fish surveys in 2023 (electrofishing and snorkeling) in Rush Creek upstream and downstream of Silver Lake, LCT were not observed. The abundance of LCT appears to be low and likely limited to Silver Lake in the vicinity of the Project. LCT are not expected to occur within the Project area unless stocked by CDFW. Fishing pressure (harvest) is likely the primary limiting factor on LCT abundance. Construction activities would not occur in the vicinity of Silver Lake and would have no effect on Silver Lake habitat and Rush Creek stream habitat compared to the No-Action Alternative; therefore, construction activities would have a negligible effect on Lahontan cutthroat trout.

#### 9.2.3.4 Construction Measures

To avoid or reduce impacts to fish and aquatic resources during construction, SCE will implement the following measures. A complete list of construction measures is included in Section 5, Appendix 5-B.

- Dewatering and Diversion Plan
- Fish Rescue and Relocation Plan
- Water Quality Monitoring Plan

- Erosion Control Plan
- Environmental Training Program
- Applicable resource agency and construction permits
- Forest Service water quality best management practices

#### 9.2.3.5 Unavoidable Adverse Effects

There are no unavoidable adverse effects to fish and aquatic resources as a result of Project facility modifications to be implemented under the Proposed Action.

#### 9.2.3.6 References

CDFW (California Department of Fish and Wildlife). 2022. Aquatic Invasive Species Decontamination Protocol. Available at: https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=43333. Accessed June 2024.

Hamilton, J.B., D.W. Rondorf, W.R. Tinniswood, R.J. Leary, T. Mayer, C. Gavette, and L.A. Casal. 2016. The persistence and characteristics of chinook salmon migrations to the Upper Klamath River prior to exclusion by dams. Oregon Historical Society. Available at https://www.ohs.org/oregon-historical-quarterly/upload/Hamilton_Chinook-Salmon-Migrations_OHQ_117_3_Fall-2016_Spread.pdf. Accessed June 2024.

SCE (Southern California Edison Company). 2024a. Draft AQ 1 – Instream Flow Technical Study Report. August. Available in Supporting Document A of the Application for New License.

____. 2024b. Draft AQ 2 – Hydrology Technical Study Report. August. Available in Supporting Document A of the Application for New License.

____. 2024c. Draft AQ 3 – Water Temperature Technical Study Report. August. Available in Supporting Document A of the Application for New License.

____. 2024d. Draft AQ 4 – Water Quality Technical Study Report. August. Available in Supporting Document A of the Application for New License.

____. 2024e. Draft AQ 6 – Fish Population and Barriers Technical Study Report. August. Available in Supporting Document A of the Application for New License.

State Water Board (State Water Resources Control Board). 2020. Final Environmental Impact Report for the Lower Klamath Project License Surrender. Available at https://www.waterboards.ca.gov/waterrights/water_issues/programs/water_quality_cert/lower_klamath_ferc14803_eir.html. Accessed June 2024.

Wood, T. M., G. R. Hoilman, and M. K. Lindenberg. 2006. Water-quality conditions in Upper Klamath Lake, Oregon, 2002–04. Scientific Investigations Report 2006 5209. U.S. Geological Survey. Available at https://pubs.usgs.gov/sir/2006/5209/. Accessed June 2024.

# FIGURES

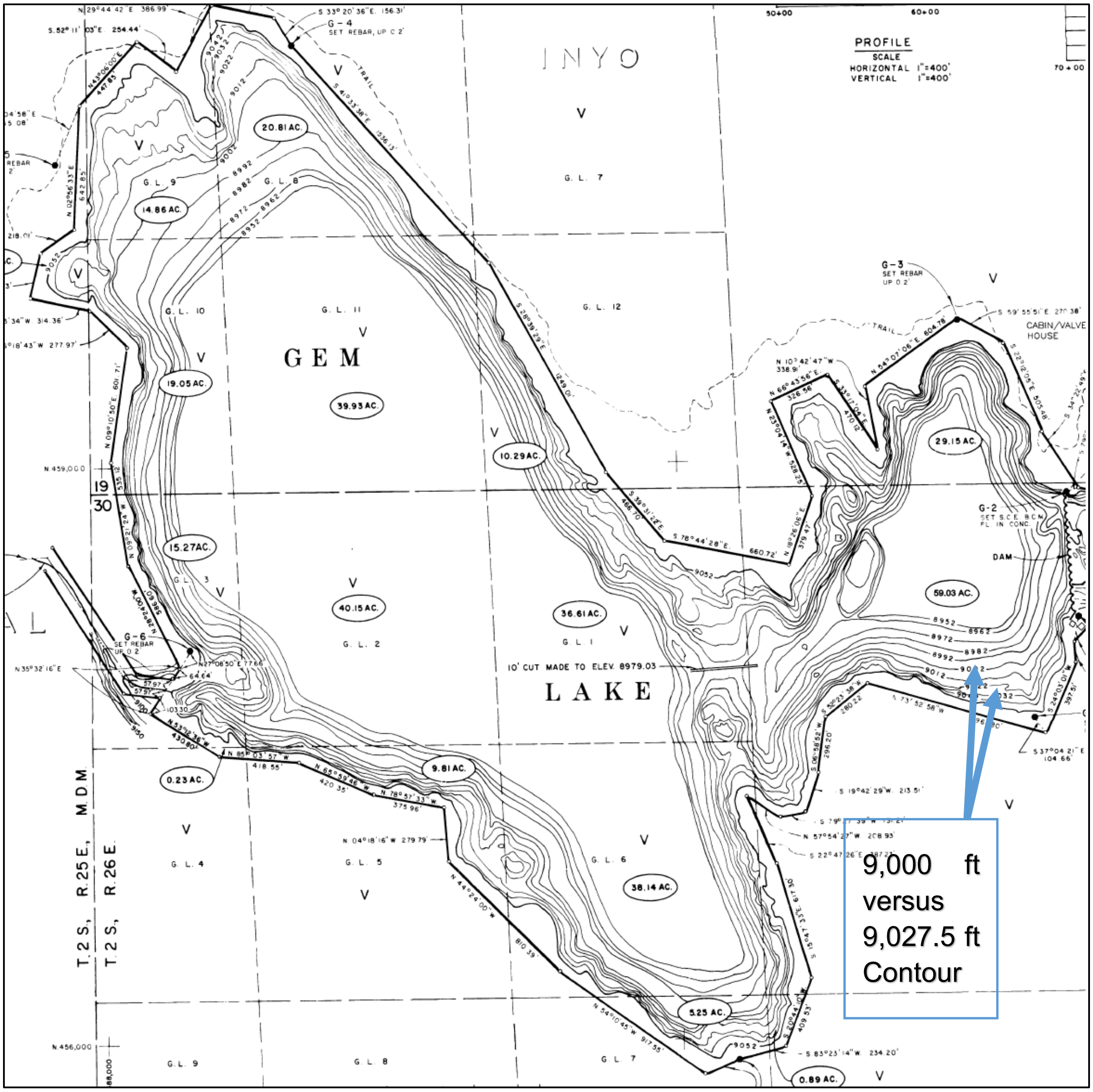



**Figure 9.2.3-1. Contour Map of Gem Lake Showing the Construction Drawdown 9,000 Feet Contour versus the Typical High Summer Storage (9,027.5)**

## TABLE OF CONTENTS

Page

9.2.4 Botanical and Wildlife Resources – Construction Effects ........................... 9.2.4-1
9.2.4.1 Potential Effects to Botanical Resources ........................................... 9.2.4-1
9.2.4.2 Potential Effects to Wildlife Resources.............................................. 9.2.4-1
9.2.4.3 Effects to Botanical Resources .......................................................... 9.2.4-3
9.2.4.4 Effects to Wildlife Resources ............................................................. 9.2.4-6
9.2.4.5 Construction Measures ...................................................................... 9.2.4-26
9.2.4.6 Unavoidable Adverse Effects ............................................................ 9.2.4-26
9.2.4.7 References........................................................................................ 9.2.4-27

## LIST OF ACRONYMS

| | |
|---|---|
| BCC | Birds of Conservation Concern |
| Bd | *Batrachochytrium dendrobatidis* |
| BMP | Best Management Practice |
| CDFW | California Department of Fish and Wildlife |
| CFP | California Fully Protected |
| CSC | California Species of Special Concern |
| dB | decibel |
| Eagle Act | Bald and Golden Eagle Protection Act |
| ESA | Endangered Species Act |
| FC | Federal Candidate |
| FE | Federally Endangered |
| FERC | Federal Energy Regulatory Commission |
| Forest Service | United States Forest Service |
| FSCC | Inyo National Forest Species of Conservation Concern |
| FT | Federally Threatened |
| $L_{max}$ | Maximum Noise Level |
| NNIP | non-native invasive plant |
| OHWM | ordinary high water mark |
| PCE | Primary Constituent Element |
| Project | Rush Creek Project |
| SCE | Southern California Edison Company |
| SD | Supporting Document |
| SE | State Endangered |
| SNYLF | Sierra Nevada yellow-legged frog |

| | |
|---|---|
| TSP | Technical Study Plan |
| TSR | Technical Study Report |
| USFWS | United States Fish and Wildlife Service |
| YT | Yosemite toad |

### 9.2.4 Botanical and Wildlife Resources – Construction Effects

This section describes the potential construction-related effects to botanical and wildlife resources (including rare, threatened, and endangered terrestrial species) that could occur because of facility modifications to be implemented under the Proposed Action for Southern California Edison Company's (SCE) Rush Creek Project (Project). A description of Project facility modifications, including restoration activities, to be implemented under the Proposed Action is included in Section 5 and Appendix 5-A.

Potential effects are determined by analyzing the changes in botanical and wildlife resources that may result from activities to be implemented under the Proposed Action compared to the No-Action Alternative (existing condition) (Section 4). Final effects determinations consider construction measures included to avoid or mitigate impacts associated with construction activities (refer to Section 5, Appendix 5-B). Unavoidable adverse effects are discussed at the end of this section.

The following potential effects to botanical and wildlife resources resulting from construction-related activities were evaluated as follows:

#### 9.2.4.1 Potential Effects to Botanical Resources

- Potential effects to whitebark pine, including:
  - Loss of individuals or degradation of habitat ground disturbance or vegetation removal during proposed Project facility modification activities.
  - Long-term benefits to whitebark pines and improvement of habitat conditions following restoration of the former lakebeds.
- Potential introduction or spread of non-native invasive plants (NNIP) during construction.
- Potential establishment of NNIPs during restoration of former lakebeds and inundation zones.

#### 9.2.4.2 Potential Effects to Wildlife Resources

- Potential effects to special-status invertebrate species, including:
  - Direct effects to breeding or foraging individuals during proposed Project facility modification activities.
  - Indirect effects through reduction or degradation of habitat resulting from removal of floral resources or introduction or spread of NNIPs during proposed Project facility modification activities.
  - Long-term benefits to habitat (increase in floral resources) from restoration of lakebeds and inundation zones.

- Potential effects to special-status amphibian species, including:
  - Direct effects to individuals, if present in work or staging areas during Project facility modification or restoration activities.
  - Indirect effects resulting from reduction or degradation of Critical Habitat and associated Primary Constituent Elements (PCE) resulting from proposed Project facility modification activities or introduction of pathogens.
  - Long-term benefits to suitable habitat and Critical Habitat from restoration of former lakebeds (including restoration of the Rush Creek channel).
- Potential effects to special-status raptors, including:
  - Direct effects to active nests or disturbance of foraging individuals resulting from proposed Project facility modification and restoration activities or repeated helicopter flights.
  - Indirect effects through degradation of water quality within aquatic habitats for aquatic-foraging raptors.
  - Long-term benefits through restoration of aquatic foraging habitat within former lakebeds (including restoration of the Rush Creek channel) and former inundation zones.
- Potential effects to other special-status birds, including:
  - Direct effects to active nests during trimming/removal of vegetation as part of proposed Project facility modification activities.
  - Long-term benefits to nesting and foraging habitat from restoration former lakebeds and former inundation zones.
- Potential effects to special-status bats, including:
  - Direct effects resulting from removal or disturbance of roosts during proposed Project facility modification activities.
  - Indirect effects through degradation of aquatic foraging habitat from proposed Project facility modification activities.
  - Long-term benefits to roosting and foraging habitat from restoration of former lakebeds (including restoration of the Rush Creek channel) and former inundation zones.

- Potential effects to special-status mammals and game mammals, including:
  - Direct disturbance of Sierra Nevada bighorn sheep or other special-status or game mammals resulting from proposed Project facility modification and restoration activities or repeated helicopter flights.
  - Long-term benefits from restoration of habitat former lakebeds (including restoration of the Rush Creek channel) and former inundation zones.

Potential effects to special-status fish and other aquatic species are discussed in Section 9.2.3, Fish and Aquatic Resources – Construction Effects. Potential effects to riparian, wetland, and littoral resources are identified in Section 9.2.7, Wetland, Riparian, and Littoral Resources – Construction Effects.

This section relies on data collected in 2022-2023 as part of the TERR 1 – Botanical Resources Technical Study Plan (TSP), TERR 2 – Wildlife Resources TSP, and AQ 7 – Special-status Amphibians TSP. Certain components of the TERR 2 – Wildlife Resources TSP were not completed in 2023. Specifically, nesting raptor surveys and special-status bat roost and seasonal use surveys were delayed to 2024 to ensure that data obtained was representative of the study area (not collected in a year with substantial snowpack). Resource agencies and stakeholders approved the study delays in a meeting held on May 11, 2023.

California Department of Fish and Wildlife (CDFW) and State Water Resources Control Board also requested an additional year of special-status amphibian surveys that are planned for 2024.

Data collected in 2024 will be analyzed and reported following the end of the 2024 field season. Results from 2024 studies will be provided in an updated technical study report to be included in the Final License Application. In addition, this analysis will be updated, as appropriate, in the Final License Application.

A discussion of potential effects to botanical and wildlife resources that could occur as a result of implementation of the Project facility modifications and restoration, with incorporation of construction measures, is provided below. Unavoidable adverse effects are also discussed at the end of this section.

### 9.2.4.3 Effects to Botanical Resources

This section presents an evaluation of potential effects of the proposed Project facility modification and restoration activities on botanical resources. This includes potential direct and indirect effects to special-status plants and potential introduction or spread of NNIPs.

The analysis area for effects to botanical resources is defined to include the boundaries of the construction work and staging areas, and worker housing sites, as defined in Section 5, Appendix 5-A. Refer to Section 8.5, Table 8.5-2 for a list of special-status plants known to occur or potentially occurring in the vicinity of the Rush Creek Project, and their status and habitat requirements. Section 8.5, Table 8.5-4 provides a list of NNIP populations identified in the vicinity of the Rush Creek Project.

## Special-Status Plants

One special-status plant, whitebark pine (*Pinus albicaulis*), is known to occur in the vicinity of proposed construction and restoration areas. Whitebark pine is listed as threatened under the federal Endangered Species Act (ESA). No other specials-status plants or mosses have been identified that would be affected by the proposed Project facility modifications.[1]

Provided below is an evaluation of potential direct and indirect effects to whitebark pine individuals.

### *DIRECT EFFECTS*

Whitebark pine was documented during botanical surveys conducted in support of the TERR 1 – Botanical Resources studies (TERR 1 – Botanical Resources Technical Study Report [TSR] [TERR 1 – TSR]) (SCE 2024a, Supporting Document [SD] A). Whitebark pine is only differentiable from other five-needle pines when it reaches a sufficient size to produce cones and mature bark. Therefore, young five-needle pines that were not distinguishable to species were also mapped in the analysis area. The analysis of potential effects of whitebark pines provided below (and associated construction measures) is inclusive of both whitebark pines and young ("unknown") five-needle pines.

Populations of whitebark pine were documented at the following locations in the analysis area:

- Two populations of whitebark pine and one population of unknown five-needle pines within the construction area near Rush Meadows Dam; and

- One population of whitebark pine and one population of unknown five-needle pines within the construction area near Gem Dam.

There are currently no populations of whitebark pine or unknown five-needle pines in the vicinity of construction area at Agnew Dam. Considering proximity to adult populations, additional whitebark pine seedlings could establish in the construction areas over time.

Construction activities required for modification of Rush Meadows Dam and Gem Dam may potentially affect whitebark pine individuals present within the construction work areas. For example, use of heavy equipment or placement of demolished concrete as fill

[1] One additional special-status plant, alpine bentgrass (*Agrostis humilis* (Forest Species of Conservation Concern, California Rare Plant Rank 2B.3) has been documented in the FERC Project boundary at two long-term riparian monitoring sites along Rush Creek below Rush Meadows Dam. The nearest population is located approximately 400 feet downstream of the proposed construction work and staging areas at Rush Meadows Dam, and would not be affected by proposed construction and restoration activities.

on the upstream and downstream sides of the dam abutments could crush or bury whitebark pine or unknown five-needle pine seedlings.

In order to minimize the potential for direct effects to whitebark pine individuals, SCE will implement Special-Status Plant Measures, which include flagging of whitebark or unknown five-needle pines within 100 feet of construction work areas, staging areas, and worker housing sites; trimming or removal of these trees will be avoided, to the degree possible. If removal of whitebark or unknown five-needle pine individuals is necessary, whitebark pines will be replanted on site during restoration at a 3:1 ratio. Implementation of Standard Construction Measures that limit the location and extent of ground disturbing work activities and require implementation of a worker environmental awareness training, as well as protocols that will be followed for inadvertent/new discoveries of sensitive species potentially affected by construction, will further minimize the potential for direct effects to whitebark pines. Refer to Appendix 5-B for the full language of each of these measures.

With implementation of construction measures, implementation of the proposed Project facility modification and restoration activities would have temporary and negligible direct effects on whitebark pines.

***INDIRECT EFFECTS***

Construction activities will require ground disturbance and use of heavy equipment, which could potentially result in destabilization and erosion of soils within the work areas. Effects to soil stability could potentially degrade habitat for native vegetation, including whitebark pines. Indirect effects to whitebark pine would be short-term and temporary. In addition, the year following completion of construction, SCE will restore those portions of the Waugh Lake and Gem Lake lakebeds that are exposed as a result of removal of the dams. Restoration will include restoration of construction work areas, staging areas, access routes, campsites, and areas where facilities have been removed; stabilization of areas upstream and downstream of the remaining portions of the dams to prevent erosion; revegetation and stabilization of sediment in the former lakebeds; and reestablishment and stabilization of the historic creek channel (Rush Creek) within the lakebeds, as necessary. Over time, exposed portions of the lakebeds would revegetate, resulting in a potential increase in habitat as compared to the existing condition. Because large populations of whitebark pine are present along the shoreline of Waugh and Gem lakes, additional whitebark pine individuals would likely become established within the restored lakebeds over time. In addition, as described above, any whitebark pines removed as part of construction will be replaced at a 3:1 ratio. Therefore, in the long-term, the Proposed Action is expected to benefit whitebark pine by increasing potential habitat within the restored lakebeds.

*NON-NATIVE INVASIVE PLANTS*

NNIPs are uncommon and present in low densities within the proposed construction and restoration areas. One small population of cheatgrass (*Bromus tectorum*) is located near the construction area at Waugh Lake (Rush Meadows Dam). Two populations of common mullein (*Verbascum thapsus*), two populations of cheatgrass (*Bromus tectorum*), and one population of curly dock (*Rumex crispus*) in the vicinity of Agnew Dam. One population of cheatgrass and one population of curly dock are located in the vicinity of Gem Dam.

Transport of ground-disturbing construction vehicles and equipment to the remote construction work and staging areas, and foot traffic associated with construction activities could result the spread of previously established NNIPs or introduce new NNIPs into the construction and restoration areas. The potential for the introduction or spread of NNIPs will be minimized through implementation of Non-Native Invasive Plant Measures that require cleaning of equipment prior to transport to construction work areas and staging areas; maintenance of stockpiles in a weed-free state; inspections of equipment and clothing followed by removal/disposal of weed seed; and use of certified weed-free erosion control materials. NNIPs could also become established in the former lakebeds or inundation zones over the period of restoration. Therefore, restoration areas will be monitored for the presence of NNIPs. If new NNIP populations are identified, the populations will be treated, as appropriate. Finally, as described in Standard Construction Measures, construction personnel will receive training regarding NNIPs and associated construction measures as part of the required worker environmental awareness training.

Refer to Appendix 5-B for the full language of each of these measures.

Implementation of these measures will minimize the potential for the introduction or spread of NNIPs. Effects would, therefore, be considered negligible.

#### 9.2.4.4 Effects to Wildlife Resources

This section presents an evaluation of potential effects of the proposed Project facility modification and restoration activities on wildlife resources, including species listed under the ESA, as well as other special-status wildlife and game species. For this analysis, species have been grouped to include taxonomically similar species, including special--status invertebrates, special-status amphibians, special-status raptors and other birds (including game birds), special-status bats, and special-status mammals (including game mammals).

The analysis area for effects to wildlife resources is defined to include construction work and staging areas, worker housing sites, and the proposed helicopter flight paths as defined in Section 5, Appendix 5-A, plus a 0.25-mile buffer. Refer to Section 8.5, Table 8.5-5 for a list of special-status wildlife species known to occur or potentially occurring in the analysis area, and their status and habitat requirements. Section 8.5, Table 8.5-6 provides a list of resident and migratory game species potentially occurring in the analysis area.

**<u>Special-Status Invertebrates</u>**

Monarch butterflies (*Danaus plexippus;* Federal Candidate [FC] for listing), which are candidates for listing under the ESA, were observed during technical studies conducted in 2023 (SCE 2024b, SD A). Milkweeds (*Asclepias* spp.) are the larval host plant for monarchs. No milkweeds were identified during TERR 1 botanical surveys (SCE 2024a, SD A), therefore the species is unlikely to breed in the analysis area. However, floral resources located in the proposed construction areas may provide foraging habitat for migratory individuals.

In addition, three Inyo National Forest Species of Conservation Concern (FSCC) butterfly species may potentially occur the analysis area:

- Sierra sulphur butterfly (*Colias behrii*) (FSCC). This species utilizes *Vaccinium* spp. as its larval host plant. *V. uliginosum* (blueberry), which grows on wet, acidic soils in the understory of coniferous forest habitat, was identified during TERR 1 botanical surveys (SCE 2024a, SD A).

- Mono Lake checkerspot butterfly (*Euphydryas editha monoensis*) (FSCC) utilizes blue-eyed mary (*Collinsia parviflora*), which grows in moist, shady montane forest habitat. This plant was identified during TERR 1 botanical studies (SCE 2024a, SD A).

- Apache fritillary butterfly (*Speyeria nokomis apacheana*) (FSCC). This butterfly uses the northern bog violet (*Viola nephryphylla*), which grows among willows, grasses, and sedges in seeps, springs, and riparian areas. Northern bog violet was not identified during the TERR 1 botanical surveys (SCE 2024a, SD A).

Provided below is a discussion of potential direct effects to individuals, as well as indirect effects to habitat for special-status invertebrates.

***DIRECT EFFECTS***

Construction work areas, staging areas, housing/campsites, and access routes are located primarily on rock outcrops or areas within the existing lakebeds that support minimal or no vegetation. However, based on a review of aerial maps showing the location of vegetation in related to proposed construction areas, vegetation may potentially be affected during the following activities:

- Removal of the Agnew Dam to Agnew Junction Flowline. An estimated maximum of 0.07 acre of aspen (*Populus tremuloides*) forest alliance and 0.05 acre of willow shrub alliance may be removed/trimmed during removal of the flowline.

- Placement of temporary bridges and establishment of equipment access routes along the downstream side of dams, as well as placement of cement (from the demolition of the dams) for reinforcement downstream of the remaining dam abutments. These activities could potentially affect an estimated maximum of 0.3 acre of willow shrub alliance at Rush Meadows Dam, 0.03 acre of willow shrub alliance at Agnew Dam, and 0.2 acre of conifer forest habitat below Gem Dam.

The larval host plants for monarch butterfly (milkweeds) and Apache fritillary butterfly (northern bog violets) were not identified during TERR 1 botanical surveys (SCE 2024a, SD A); therefore, vegetation removal/trimming would not result in effects to breeding for these species. Blueberry shrubs and blue-eyed mary flowers (the larval host species for

Sierra sulphur butterfly and Mono Lake checkerspot butterfly, respectively) were identified during the TERR 1 botanical surveys (SCE 2024a, SD A). These plants could potentially occur in moist or shady areas below the dams where bridges will be placed, or along the Agnew Dam to Agnew Junction Flowline. Therefore, vegetation removal/trimming could potentially result in minor, localized effects to Sierra sulphur butterfly and Mono Lake checkerspot butterfly, including disturbance (i.e., flushing or displacement) or removal of larvae.

Foraging habitat for butterflies is more general than breeding habitat, and consists of flowering plants of a wide variety of species. Therefore, trimming or removal of vegetation below the dams or along flowline at Agnew could potentially result in disturbance (i.e., flushing or displacement) of all four butterflies species, if foraging in the vicinity. Flushing or displacement of foraging individuals would be short term, and would cease upon completion of the activity.

Implementation of construction measures will minimize the potential for direct and indirect effects to special-status invertebrates. This includes, but is not limited to, construction measures that limit ground disturbing activities to defined work areas; limit removal of riparian vegetation; and require work environmental awareness training which including information on special-status invertebrates and their habitat. Refer to Section 5, Appendix 5-B for the full language of measures to be implemented to minimize effects to special-status invertebrates.

With implementation of measures, proposed Project facility modification and restoration activities would have negligible and temporary direct effects on special-status invertebrates.

***INDIRECT EFFECTS***

As described previously, while construction work areas, staging areas, housing/campsites, and access routes do not support abundant floral resources for special-status butterflies, some trimming and/or removal of vegetation will be required for removal of the flowline at Agnew and for placement of temporary bridges. Removal of vegetation would result in a minor and temporary decrease in potential habitat available for foraging butterflies; and potentially in a temporary decrease in potential breeding habitat for Sierra sulphur butterfly and Mono Lake checkerspot butterfly, if host plants for these species were affected. In addition, importation and use of construction vehicles and equipment, and foot traffic associated with construction activities could degrade native plant habitat for special-status invertebrates through the introduction or spread of NNIPs.

The potential for the introduction or spread of NNIPs will be minimized through implementation of Non-Native Invasive Plant Measures that require cleaning of equipment prior to transport to construction work areas and staging areas; maintenance of stockpiles in a weed-free state; inspections of equipment and clothing followed by removal/disposal of weed seed; and use of certified weed-free erosion control materials. Construction personnel will receive training regarding NNIPs and associated construction measures as part of the required worker environmental awareness training. NNIPs will also be monitored and treated, if necessary, as part of restoration of the lakebeds after completion of the facility modifications (described below). Refer to Appendix 5-B for the full language of each of these measures. Implementation of these measures will minimize the potential for the introduction or spread of NNIPs.

As described previously, SCE will restore those portions of the reservoir lakebeds that are exposed as a result of modification (breaching) of the dams. Over time, exposed portions of the lakebeds would revegetate, resulting in a potential increase in floral resources as compared to the existing condition. Therefore, in the long term, the Proposed Action is expected to benefit special-status invertebrates by increasing the quality and quantity of available foraging and breeding habitat.

**Special-Status Amphibians**

The proposed Project facility and restoration activities lie within the geographic range of two ESA-listed special-status amphibians, the Sierra Nevada yellow-legged frog (*Rana sierrae* [SNYLF]) Federal Endangered [FE] and Yosemite toad (*Anaxyrus canorus* [YT], Federal Threatened [FT]). Waugh Lake, Rush Meadows Dam, and Rush Creek below Rush Meadows Dam lie within designated Critical Habitat for SNYLF and YT. Refer to Section 8.5, Map 8.5-6 for the location of critical habitat for both species.

Provided below is a discussion of potential direct and indirect effects to SNYLF and YT.

***DIRECT EFFECTS***

This section provides an analysis of potential effects to federally designated Critical Habitat for SNYLF and YT, as well as potential effects to SNYLF and YT individuals.

*CRITICAL HABITAT*

As stated previously, Waugh Lake, Rush Meadows Dam, and Rush Creek below Rush Meadows Dam lie within designated Critical Habitat for SNYLF and YT. A description of potential effects to Critical Habitat for each species (SNYLF and YT) is provided below.

There is no suitable aquatic breeding habitat for SNYLF or YT in the vicinity of the construction work areas and staging areas that lie within Critical Habitat (i.e., those associated with Rush Meadows Dam). The closest suitable breeding habitats are two small ponds, one located approximately 0.8-mile west of Rush Meadows Dam and one located 0.3-mile east of Rush Meadows Dam. Refer to Section 8.5, Maps 8.5-7 and 8.5-8 for the location of potential aquatic breeding habitat for both species. No SNYLF or YT individuals were observed in these habitats during visual encounter surveys conducted in support of the AQ 7 – Special-Status Amphibian studies (AQ 7 – Special-Status Amphibian TSR [AQ 7 – TSR]) (SCE 2024c, SD A). These ponds, which are not hydrologically connected to Rush Creek, would not be affected by the proposed Project facility modification or restoration activities. Therefore, construction and restoration would have no effect on Primary Constituent Elements PCEs for aquatic breeding habitat within Critical Habitat for SNYLF or YT.

Waugh Lake and Rush Creek below Rush Meadows Dam do not represent breeding habitat for SNYLF; but they do support several non-breeding PCEs and therefore may provide non-breeding habitat for shelter, foraging, predator avoidance, and aquatic dispersal of juvenile and adult SNYLF. Refer to AQ 7 – TSR, Table AQ 7-2 (SCE 2024c) for a list of SNYLF PCEs in Waugh Lake and Rush Creek below Rush Meadows Dam.

Implementation of the proposed Project facility modifications and restoration activities at Rush Meadows Dam could result in temporary effects to PCEs within SNYLF non-breeding habitat. Specifically, the proposed activities could result in degradation of water quality within aquatic habitat through increased erosion and sedimentation, or contamination of water from storage and use of fuels or other toxic substances. The potential for degradation of aquatic habitat would be minimized through implementation of measures including Water Quality Measures and Hazardous Materials Measures, as well as applicable United States Forest Service (Forest Service) Water Quality Best Management Practices (BMP). Examples of these measures include implementing an Erosion Control Measures Plan, implementing secondary containment measures around refueling equipment, implementing appropriate debris disposal measures, and limiting construction areas to minimum area necessary to complete construction. In addition, SCE will obtain all required permits prior to implementation of activities within the ordinary high water mark (OHWM) or bed and bank of Waters of the U.S. All conditions required under the permits will be implemented as part of the Project facility modifications. Refer to Appendix 5-B for the full language of each of these measures.

Implementation of construction measures would minimize the potential for temporary indirect effects to non-breeding aquatic habitat for SNYLF.

Upland areas within 82 feet of Waugh Lake and Rush Creek below Rush Meadows Dam that have vegetative cover may support PCEs upland habitat for SNYLF. However, the construction work areas upstream and downstream of Rush Meadows Dam within 82 feet of water are mostly devoid of vegetation, or support smaller patches of vegetation, and therefore represent marginal upland habitat for SNYLF. In addition, uplands within 0.78 mile of aquatic breeding habitat for YT may contain PCEs for upland habitat for YT. Refer to Table AQ 7-2 and Table AQ 7-6 in the AQ 7 TSR (SCE 2024c) for a list of PCEs for upland habitat for SNYLF and for YT (respectively) present along Waugh Lake and Rush Creek below Rush Meadows Dam.

Proposed construction and restoration activities could temporarily degrade upland PCEs for SNYLF and YT. For example, placement of cement upstream and downstream upstream and downstream of Rush Meadows Dam to support the remaining abutments; or placement of the temporary bridge across Rush Creek downstream of the dam could impact vegetation that may provide cover for these species; and excavation and ground disturbance within Waugh Lake could affect rodent burrows or require removal of logs within upland habitat for YT. Temporary effects to upland PCEs within Critical Habitat will be minimized through implementation of Standard Construction Measures that limit construction activities to specified areas and require implementation of worker environmental awareness training, including training on special-status amphibians and applicable measures to minimize the potential for effects to individuals and habitat.

Riparian Measures that require flagging and avoidance of riparian vegetation outside of specific work and staging areas will also be implemented. Refer to Appendix 5-B for the full language of each of these measures.

Following completion of the proposed Project facility modifications, SCE will restore former lakebeds and the historic streambed of Rush Creek. Restoration activities, which are described in Section 5, Appendix 5-A, will include, but are not limited to stabilization of areas upstream of the former dam site, as appropriate, to prevent erosion, restoration of work areas, staging areas, and work camp sites; revegetation and stabilization of the former lakebed, and re-establishment of Rush Creek within the lakebed. Over the long term, decommissioning and subsequent restoration activities would increase the quantity and quality of habitat for SNYLF and YT, primarily within Waugh Lake. For example, rather than a deep reservoir that provides marginal non-breeding habitat for SNYLF and does not represent breeding habitat for YT, the lakebed within Waugh Lake would likely, over time, return to a complex of stream, meadow, and riparian or forest habitats with a wider range of water depths and flow conditions, providing a greater diversity of aquatic and upland habitats. With the removal of Rush Meadows Dam from the Federal Energy Regulatory Commission (FERC) Project boundary, periodic disturbances within from long-term operations and maintenance would no longer be required, and a potential dispersal barrier between the former Waugh Lake lakebed and Rush Creek downstream would be removed. Therefore, in the long-term, the Proposed Action is expected to improve PCEs for aquatic and uplands habitats within Critical Habitat for SNYLF and YT.

*INDIVIDUALS*

SNYLF and YT were not observed during visual encounter surveys conducted in 2023 (SCE 2024c, SD A). Additional visual encounter surveys for both species are planned for the summer of 2024.

The nearest known occurrences of SNYLF and YT are more than 1 mile from the construction area at Rush Meadows Dam (refer to Section 8.5, Map 8.5-5). Based on the results of the AQ 7 – TSR (SCE 2024c, SD A), there is some potential, although low, for the species to disperse into the Rush Meadows Dam construction area. SNYLF and YT are unlikely to occur in the vicinity of Gem Dam and Agnew Dam, which are well outside the generally accepted dispersal distance of known populations (i.e., approximately 2 miles for SNYLF (U.S. Fish and Wildlife Service [USFWS] 2016) and approximately 0.78 mile for YT [USFWS 2016]).

In the unlikely event that SNYLF and YT individuals disperse into the construction area at Rush Meadows Dam, construction activities could potentially result in harm or harassment of individuals from use of ground-disturbing construction equipment; entrapment in excavations or erosion control materials; or contact with water pumping equipment.

The potential for direct effects to special-status amphibians will be minimized through implementation of General Wildlife Measures and Special-Status Amphibian Measures, including pre-construction surveys; stop-work and reporting protocols if SNYLF or YT individuals are observed in construction areas; requirements to cover excavations when not in use and/or provide escape ramps; prohibition of the use of tightly woven netting, plastic monofilament, or similar materials; and use of low-velocity water pumps to prevent mortality of aquatic species. The required worker environmental awareness training will include training on identification of special-status amphibians, applicable construction measures, and procedures to follow in case SNYLF and/or YT are inadvertently discovered in work areas. Refer to Appendix 5-B for the full language of each of these measures. Implementation of construction measures will minimize the potential for direct effects to special-status amphibians.

***INDIRECT EFFECTS***

Construction and restoration activities could indirectly affect SNYLF and YT through alteration of suitable habitat. Refer to the discussion of impacts to Critical Habitat for an assessment of potential effects to suitable habit for SNYLF and YT in the vicinity of Waugh Lake and Rush Creek below Rush Meadows Dam, which are located within Critical Habitat. SNYLF and YT could also be indirectly affected through the spread of chytrid pathogens into the area. Each of these potential effects, as well as measures that will be implemented to minimize effects, are further described below.

*SUITABLE HABITAT*

Three wet meadows and three ponds were identified as representing potential aquatic breeding habitat for SNYLF and/or YT during the AQ 7 – Special-status Amphibian studies (SCE 2024c, SD A). All of these habitats are outside of proposed construction work areas, staging areas, and worker camp sites. Therefore, there would be no effect to potential aquatic breeding habitat for SNYLF and YT under from the proposed Project facility modification and restoration activities.

Waugh Lake and Rush Creek below Rush Meadows Dam do not represent breeding habitat for SNYLF; but they do support several non-breeding PCEs and therefore may provide non-breeding habitat for shelter, foraging, predator avoidance, and aquatic dispersal of juvenile and adult SNYLF. Refer to Table AQ 7-2 in the AQ 7 TSR (SCE 2024c, SD A) for a list of SNYLF PCEs in Waugh Lake and Rush Creek below Rush Meadows Dam.

Implementation of the proposed Project facility modifications and restoration activities could result in temporary effects to aquatic non-breeding habitat for SNYLF. Specifically, as described previously for Critical Habitat, the proposed activities could result in degradation of water quality within aquatic habitat through increased erosion and sedimentation, or contamination of water from storage and use of fuels or other toxic substances. The potential for degradation of aquatic habitat will be minimized through implementation of Water Quality Measures and Hazardous Materials Measures, as well as implementation of applicable Water Quality Forest Service BMPs. SCE will also obtain all required permits prior to implementation of activities within the OHWM or bed and bank of Waters of the U.S./State. All conditions required under the permits will be implemented as part of the Project facility modifications. Refer to Appendix 5-B for the full language of each of these measures. With implementation of construction measures, effects to aquatic non-breeding habitat for SNYLF would be minimized.

Upland habitat for SNYLF is defined to include area within 82 feet of aquatic habitat that support riparian or upland vegetation that provides cover but allows sufficient sunlight for basking. The AQ 7 – TSR (SCE 2024c, SD A) identified Waugh Lake, Agnew Lake, Gem Lake and Rush Creek below the reservoirs as supporting upland habitat for SNYLF. The construction work areas upstream and downstream of Rush Meadows Dam, Agnew Dam, and Gem Dam within 82 feet of water are mostly devoid of vegetation, or support smaller patches of vegetation, and therefore represent marginal upland habitat for SNYLF.

Upland habitat for YT is defined to include terrestrial habitats within 0.78 mile of suitable aquatic breeding habitat that provide cover/refugia (e.g., rodent burrows, logs, rocks, or other surface objects), dispersal corridors, or foraging/prey resources. The AQ 7 – TSR (SCE 2024c, SD A) identifies Waugh Lake and Rush Creek below Rush Meadows Dam as supporting upland habitat for YT, while Agnew Lake and Gem Lake (as well as Rush Creek below these reservoirs) do not. The construction areas defined around Rush Meadows Dam contain cover objects such as logs and rocks, and may contain rodent burrows, and therefore may represent suitable upland habitat for YT.

Upland habitats for SNYLF and YT within the construction areas could be temporarily degraded by proposed construction and restoration activities. For example, removal of the Agnew Dam to Agnew Junction Flowline and excavation and ground disturbance could affect rodent burrows or require removal of logs within upland habitat for SNYLF and/or YT. As described previously under effects to Critical Habitat, SCE will implement General Construction Measures and Riparian Measures that limit work to defined work and staging areas, limit riparian vegetation removal, and require training of workers regarding special-status amphibians and associated construction measures to protect their habitat. Refer to Appendix 5-B for the full language of each of these measures. With implementation of construction measures, effects to upland habitat for SNYLF and YT would be minimized.

All effects to aquatic and upland habitat for SNYLF and YT would be temporary and limited to the duration of implementation of construction and restoration activities. As described previously, following completion of the proposed Project facility modifications, SCE will restore former lakebeds and the historic streambed of Rush Creek. Over the long term, decommissioning and subsequent restoration activities would increase the quantity and quality of habitat for SNYLF and YT, primarily within Waugh Lake. For example, rather than a deep reservoir that provides marginal non-breeding habitat for SNYLF and does not represent breeding habitat for YT, the lakebed within Waugh Lake would likely, over time, return to a complex of stream, meadow, and riparian or forest habitats with a wider range of water depths and flow conditions, providing a greater diversity of aquatic and upland habitats. Restoration of new exposed inundation zones along the shoreline of Gem Lake and Agnew Lake may improve upland habitat for these species. Therefore, in the long-term, the Proposed Action is expected to improve PCEs for aquatic and uplands habitats within Critical Habitat for SNYLF and YT.

*INTRODUCTION OR SPREAD OF CHYTRID PATHOGEN*

The chytrid pathogen *Batrachochytrium dendrobatidis* (Bd) is an infectious disease and an invasive species that has contributed to the decline of more than 400 amphibian species worldwide (Lips 2016). California experienced some of the earliest declines of amphibian populations attributed to Bd, including declines in YT and mountain yellow-legged frog (*Rana muscosa*) (Lips 2016). Although the pathogen is not vector-borne, it may be spread mechanically by contaminated water or mud, or via footwear, nets and other equipment.

In order to minimize the potential for spread of Bd, SCE will implement Special-Status Amphibian Measures, including a requirement that equipment must be cleaned and free of mud and dirt prior to being transported to the construction and restoration work areas at Waugh Lake, Agnew Lake, and Gem Lake. In addition, Standard Construction Measures require implementation of worker environmental awareness training, which will include information on Bd and methods to reduce its spread. Refer to Appendix 5-B for the full language of each of these measures. With implementation of these construction measures, effects to SNYLF and YT related to chytrid pathogen would be minimized.

*Considering direct and indirect effects to SNYLF, YT, and their critical habitat described above, proposed construction/restoration activities* ***may affect, but is not likely to adversely affect*** *the species. Over the long-term, the removal of Project facilities and associated restoration would result in an overall benefit to SNYLF, YT, and critical habitat.*

## Special-Status Raptors

This section evaluates the effects of the proposed Project facility modification and restoration activities on special-status raptors. Two special-status raptors listed under the Bald and Golden Eagle Protection Act (Eagle Act) are known to occur in the analysis area, including the golden eagle (Eagle Act, California Fully Protected [CFP]), and the bald eagle (Eagle Act, FSCC, SE, CFP).

The analysis area contains suitable habitat for five additional special-status raptor species, including northern goshawk (*Accipiter gentilis*) (California Species of Special Concern [CSC]), American peregrine falcon (*Falco peregrinum anatum*) (USFWS Bird of Conservation Concern [BCC]), short-eared owl (*Asio flammeus*) (BCC, CSC), long-eared owl (*Asio otus*) (BCC, CSC), and flammulated owl (*Psiloscops flammeolus*) (BCC).

Common raptor species such as osprey and red-tailed hawk are also known to nest and forage in the analysis area.

Potential direct and indirect effects to raptors from implementation of proposed Project facility modifications and subsequent restorations are described below.

### *DIRECT EFFECTS*

Lands surrounding the proposed Project facility modification and restoration work areas, staging areas, access routes, and worker housing sites at Waugh Lake, Agnew Lake, and Gem Lake —as well as proposed helicopter routes from the June Mountain Ski Area Base of Operations to the work areas—provide suitable nesting and/or foraging habitat for a number of cliff-nesting and tree-nesting raptors.

Noise from construction equipment, human presence, and helicopter use could result in disturbance effects to raptors foraging or nesting in the vicinity. Proposed helicopter routes are shown in Section 5, Appendix 5-A, Map A-1. As described in Section 5, Appendix 5-A, the Project facility modifications will require:

- Approximately 150 round-trip helicopter trips to Rush Meadows Dam during one construction season, which equates to 30 trips per month or approximately one or two trips per day (on average);
- Approximately 110 round-trip helicopter trips to Agnew Dam during one construction season, which equates to 22 trips per month or approximately one trip per day (on average);
- Approximately 1,980 round trip helicopter trips to Gem Dam over three construction seasons, which equates to approximately 132 trips per month or approximately six trips per day (on average).

During mobilization (approximately 2 weeks) and demobilization (approximately 2 weeks) each season, heavy equipment would be transported using a Skycrane helicopter; A-Star or modified Black Hawk helicopters would be used for the remainder of the construction season. Map 9.2.15-2 in Section 9.2.15, Noise – Construction effects illustrate those locations that would experience temporary, single-event helicopter noise at a Maximum Noise Level ($L_{max}$)[2] of 60 decibels (dB) or higher and at an $L_{max}$ of 80 dB or higher. Refer to Section 9.2.15, Noise – Construction Effects, for more details on noise analyses conducted in support of the relicensing.

A literature review completed by Anderson (2007) compares data from various studies on the response of raptors (including eagles, peregrine falcon, osprey, and red-tailed hawk) to disturbance and noise from helicopters. In the studies reviewed, helicopters elicited a disturbance response (e.g., flushing from nest) more frequently than fixed-wing aircraft; however, adults were typically flushed from nests only when helicopters approached closely or hovered for longer periods of time. A sudden or surprise approach may elicit a stronger response from adult raptors at nests than a gradual approach (White and Sherrod 1973).

[2] Maximum Sound Level ($L_{max}$) represents the highest A-weighted sound level measured during a single event in which the sound changes with time. $L_{max}$ is the maximum level that occurs over a fraction of a second.

The expected average number of flights on any one construction day is six flights, an average that varies according to the construction season (e.g., construction at Rush Meadows Dam and Agnew Dam require less flights per season compared to Gem Dam, which requires more flights per season). The potential for disturbance may be greater during use of the Skycrane for mobilization and demobilization, which is louder and larger than the smaller helicopters to be used for the remainder of the construction activities. Helicopters would fly in a fixed route, minimizing the potential for surprise approaches, and would not linger or hover for long periods of time in any one location, to the degree possible.

In order to minimize temporary disruption of breeding raptors during construction and/or use of helicopters, SCE will implement Special-Status Raptor Measures which require SCE to conduct surveys to identify the location of active nests within 0.25 mile of construction work areas, staging areas, and worker camp sites, as well as along the helicopter flight paths; and state that, if nests are identified, SCE will designate applicable species-specific protective buffers. Worker environmental awareness training (Standard Construction Measures) will be implemented to inform staff about raptor species, applicable protection measures, and procedures (refer to General Wildlife Measures) to follow in case raptor nests are inadvertently discovered in the vicinity of work areas or along helicopter flight paths during construction. Refer to Appendix 5-B for the full language of each of these measures. With implementation of these measures, potential effects to nesting raptors will be negligible.

Foraging raptors may also be affected by noise of construction and repeated helicopter flights. However, construction effects will be limited to the construction season, which entails one season at both Rush Meadows and Agnew dams. While construction would be conducted for an estimated 3 consecutive seasons at Gem Dam, helicopter flights are a part of routine operations and maintenance under the existing condition; therefore, foraging raptors such as the bald eagles observed at Gem Dam may already be accustomed to these activities. Following construction, it is anticipated that foraging behaviors would continue normally, and would likely be improved through the removal of Rush Meadows and Agnew dams (see below for long-term benefits to special-status raptors). Effects to foraging raptors would be temporary and negligible.

***INDIRECT EFFECTS***

The proposed Project facility modifications would result in minimal effects to habitat for foraging and nesting raptors for several reasons. Project work areas, staging areas, and worker camp sites are located primarily in previously disturbed areas, or in areas that support only small-scale patchy vegetation that does not provide foraging or nesting habitat for raptors. Surrounding forest habitats and cliffs will not be affected by construction.

Use of ground-disturbing construction equipment could result in the degradation of water quality in downstream aquatic habitats from sedimentation or runoff of hazardous materials during work within the lakebeds and Rush Creek. Degradation of water quality could, in turn, affect fish that represent prey species for bald eagles or osprey that may potentially forage in the reservoirs or in Rush Creek. The potential for temporary downstream effects to aquatic foraging habitats for bald eagles or osprey will be minimized through implementation of Water Quality Measures and Hazardous Materials Measures, and applicable Forest Service BMPs. In addition, SCE will implement General Wildlife Measures, including obtaining agency permits for work within Waters of the U.S. (i.e., Waugh Lake, Agnew Lake, Gem Lake, and Rush Creek downstream of the reservoirs); all conditions for maintenance of water quality and aquatic habitats required under these permits will be implemented as part of the Project facility modifications. Refer to Appendix 5-B for the full language of each of these measures. With incorporation of construction measures, effects to aquatic foraging habitat from implementation of the Project facility modifications will be negligible.

In the long-term, removal of the Rush Meadows and Agnew dams will result in reduced operations and maintenance footprints. Operations and maintenance activities would no longer be conducted within the Ansel Adams Wilderness. Therefore, special-status raptors are expected to benefit from reduced human footprint and presence on the landscape compared to the existing condition.

**Other Special-Status Birds and Game Birds**

In addition to raptors, the Proposed Action may also affect other special-status birds and game birds. Three special-status birds were observed during surveys conducted in support of the TERR 2 – Wildlife Resources reconnaissance surveys (TERR 2 – Wildlife Resources TSR [TERR 2 – TSR]) (SCE 2024b, SD A), calliope hummingbird (*Selasphorus calliope*) (Bird of Conservation Concern [BCC]), yellow warbler (*Setophaga petechia*) (CSC) and Cassin's finch (*Haemorhous cassinii*) (BCC). Suitable habitat for four additional bird species, including black swift (*Cypesloides niger*) (BCC, CSC), Lewis's woodpecker (*Melanerpes lewis*) (BCC), little willow flycatcher (*Empidonax traillii brewsteri*) (FSCC, State Endangered [SE]), and olive-sided flycatcher (*Contopus cooperi*) (BCC, CSC) is also present in the area where operations and maintenance will occur for the Modified Project.

Game birds potentially occurring in the vicinity of proposed construction and restoration areas include resident game birds (e.g., mountain qual [*Oreotyx pictus*] and California quail [*Callipepla californica*), migratory game birds (e.g., mallard [*Anas platyrhynchos*] and American coot [*Fulica americana*]). Refer to Section 8.5. Table 8.5.6 for a complete list of resident and migratory game birds.

Provided below is a discussion of potential direct and indirect effects to non-raptorial special-status birds and game birds resulting from implementation of the proposed Project facility modifications.

***DIRECT EFFECTS***

The construction areas, work areas, and worker camp sites support small patches of riparian and upland (conifer) vegetation that may provide habitat for special-status birds. Noise from construction and human presence may potentially result in disturbance effects to foraging birds (e.g., flushing). These effects would be temporary and limited to the duration of construction. Placement of temporary bridges to allow for crossing of Rush Creek below the dams, placement of cement (from the demolition of the dams) for reinforcement of the dam abutments; and removal of the Agnew Dam to Agnew Junction Flowline will require removal of up to 0.37 acre of riparian habitat; 0.07 acre of aspen habitat.

In order to minimize the potential for direct effects to birds potentially nesting in this vegetation, SCE will implement Other Special-Status Bird Measures, which require SCE to remove vegetation outside of the breeding season (typically March through August, or as determined through consultation with resource agencies). If removal outside of the breeding season is not possible, SCE will conduct pre-construction surveys, and implement species-specific protection buffers around nests, as required. Other measures to be implemented that will minimize the potential for direct impacts to songbirds include Standard Construction Measures that limit the hours and location of construction activities, worker environmental awareness training, and General Wildlife Measures, including protocols for reporting and addressing presence of special-status wildlife (including birds) observed in the work areas that may harmed by construction activities. Refer to Appendix 5-B for the full language of each of these measures. With implementation of construction measures, direct effects to other special-status birds and game birds would be temporary and negligible.

***Indirect Effects***

As described previously, the proposed construction work areas, staging areas, and worker camp sites are dominated by rock outcrops and contain only small patches of vegetation representing suitable nesting and foraging habitat for special-status birds. The lakes and Rush Creek in the vicinity of the construction areas may provide foraging habitat for black swift and other insectivorous birds that feed over water. The proposed Project facility modifications will result in removal or trimming of up to 0.37 acre of riparian and 0.07 acre of aspen vegetation. Vegetation outside of the designated work areas would not be affected. To minimize effects to habitat for songbirds, SCE will implement construction measures that will minimize impacts to vegetation, including standard measures that limit construction activities to defined areas, limit the amount of vegetation removal, and protect riparian vegetation. Refer to Appendix 5-B for the full language of each of these measures.

Use of ground-disturbing construction equipment could result in the degradation of water quality in downstream aquatic habitats from sedimentation or runoff of hazardous materials during work within the lakebeds and Rush Creek. Degradation of water quality could, in turn, affect aquatic macroinvertebrates that represent prey species for aquatic-foraging birds. Refer to the discussion of potential effects to aquatic-foraging raptors for a description of construction measures that will be implemented to minimize the potential for effects to aquatic foraging habitats. With implementation of construction measures, indirect effects to other special-status birds and game birds would be temporary and negligible.

Finally, the restoration of the former lakebeds and the historic streambed of Rush Creek would increase and improve potential habitat for non-raptorial special-status birds in the long term by increasing the amount of vegetation and habitat heterogeneity within the former lakebeds. The current reservoir beds would be restored and riparian vegetation would be established within the Rush Creek channel in the former Waugh lakebed. Riparian vegetation along Rush Creek downstream of the Rush Meadows Dam would be increased or maintained. Therefore, in the long term, the Proposed Action is expected to both improve and increase habitats for non-raptorial special-status birds and game birds compared to the existing condition.

## Special-Status Bats

No special-status bat species listed under the ESA or CESA were identified during implementation of the TERR 2 bat studies (SCE 2024b, SD A).

Several special-status bat species considered sensitive by the State of California have the potential to roost in the analysis area, including pallid bat (*Antrozous pallidus*) (CSC), Townsend's big-eared bat (*Corynorhinus townsendii*) (CSC), and spotted bat (*Euderma maculatum*) (CSC). The analysis area also represents suitable roosting habitat for common bat species.

Provided below is an evaluation of potential direct and indirect effects of the proposed Project facility modification and restoration activities on special-status bats.

### *DIRECT EFFECTS*

Special-status bat roosts, if present could potentially be disturbed by the proposed Project facility modifications. Specifically, several facilities that were identified as potentially supporting bats roosts during implementation of TERR 2 special-status bat studies (SCE 2024b, SD A) will be modified or removed as part of the proposed Project facility modifications. This includes the dams (Rush Meadows and Agnew dams); the Rush Meadows Dam Equipment Shed, the Rush Meadows Dam Gage House, and the Agnew Weather Station. As described above, these facilities will be inspected for the presence of roosting bats in 2024. Modification/removal of these Project facilities could result in removal of active bat roosts.

Project construction activities will likely be initiated during the bat maternity season (April – September). Removing Project facilities outside the maternity season is not practicable at these locations, as winter snow can return as early as October. Therefore, the year prior to construction, SCE will implement Special-Status Bat Measures, which require SCE to inspect all facilities to be modified or removed that are known to and/or may potentially support bat roosts. If roosts are discovered, SCE will, in consultation with resource agencies, install exclusion devices and/or deterrents on the Project facility in the year prior to construction to prevent establishment of bat roosts, as necessary.

Bats typically use night roosts singly or in small groups for only a single evening before moving on to other roosts. Construction activities are required to be implemented only during daylight hours (i.e., between sunrise and sunset) (refer to Standard Construction Measures in Appendix 5-B), when facilities would not be occupied by night-roosting bats. Modification or removal of Project facilities during the day would therefore not affect night-roosting bats.

Similarly, the proposed Project facility modification and restoration activities are unlikely to directly affect foraging bats. As stated above, the construction activities are required to be implemented only during daylight hours (i.e., between sunrise and sunset). Bats typically forage at dawn and dusk and thus would not be disturbed by daytime activities.

With implementation of these measures, effects to active special-status bat day roosts or maternity roosts would be temporary and negligible.

***INDIRECT EFFECTS***

Project work areas, staging areas, and worker camp sites are restricted to defined areas and would have minimal effect on terrestrial habitat for roosting or foraging bats. As described above, three facilities that may be suitable for use by roosting bats would be removed (i.e., Rush Meadows Dam Equipment Shed, the Rush Meadows Dam Gage House, and the Agnew Weather Station). The three dams also provide potentially suitable roosting structures for bats. While large portions of Rush Meadows Dam and Agnew Dam would be removed, some portion of the structures (e.g., dam abutments) would remain that may provide cracks and crevices suitable for bat roosts. The majority of Gem Dam would remain in place and would continue to provide structures suitable for roosting bats. Therefore, the Project would result in minor reduction in the availability of structures for roosting bats.

Many bat species forage for flying insects and aquatic macroinvertebrates over water. Use of ground-disturbing construction equipment could result in the degradation of water quality from sedimentation or runoff of hazardous materials, which would in turn affect the availability of aquatic macroinvertebrate prey. Refer to the discussion of potential effects to aquatic-foraging raptors for a description of construction measures that will be implemented to minimize the potential for effects to aquatic foraging habitats.

With incorporation of these measures, effects to special-status bat roosting and foraging habitat from implementation of the Project facility modifications would be negligible.

The restoration of the former lakebeds will improve foraging habitat conditions for special-status bat species. The former lakebeds will likely return to more open upland and meadow foraging habitats for special-status bats. Over time, restoration of forested and riparian habitats within the lakebeds may also provide additional natural bat roosting habitat compared to the existing condition.

**Special-Status Mammals**

No special-status mammals were observed within the analysis area during implementation of the TERR 2 technical studies (SCE 2024b, SD A). However, based on wildlife habitats present, records of known occurrences, and consultation with resource agencies, three ESA-listed special-status mammals may potentially occur in the analysis area, including Sierra Nevada bighorn sheep (*Ovis canadensis sierrae*) (FE, California SE, CFP), the Sierra Nevada red fox (*Vulpes vulpes necator*) (Sierra Nevada Distinct Population Segment) (FE, ST), and the North American wolverine (*Gulo gulo luscus*) (Contiguous United States Distinct Population Segment) (FT, ST, CFP).

Provided below is an analysis of potential direct and indirect effects to ESA-listed special-status mammals.

### *SIERRA NEVADA BIGHORN SHEEP*

#### *DIRECT EFFECTS*

Critical Habitat Unit 2 (Mount Gibbs) for Sierra Nevada bighorn sheep is present north of the analysis area (within 1.2 mile of the FERC Project boundary). Refer to Section 8.5, Map 8.5-6 for the location of Critical Habitat for Sierra Nevada bighorn sheep. Based on discussions with CDFW, bighorn sheep have never been recorded within the analysis area and are unlikely to move into the FERC Project boundary (Lacey Green, pers. comm). This species primarily utilizes habitats north of the FERC Project boundary.

As described previously, a Skycrane helicopter would be used to transport heavy equipment during mobilization (approximately 2 weeks) and demobilization (approximately 2 weeks); and A-Star or modified Black Hawk helicopters would be used to transport staff and equipment during the remainder of the construction seasons. Refer to Section 5, Appendix 5-A, Map A-1 for the proposed helicopter flight paths and landing areas.

Noise and disturbance from helicopters have been demonstrated to affect bighorn sheep distribution, movement patterns, habitat use, and foraging behavior. Helicopter flight paths are known to alter the movements of bighorn sheep populations (Bleich et al. 1990). During spring, female bighorn sheep were found to change habitat use after helicopter disturbance, often relocating to steeper terrain to minimize the perceived risk of predation (Bleich et al 1994). A study conducted on Grand Canyon bighorn sheep populations (*Ovis canadensis nelson*) found that sheep foraging in the flight path of helicopters exhibit a significant decrease (43 percent) in foraging efficiency when helicopters are present (Stockwell and Bateman 1991). Additionally, bighorn sheep are not known to become desensitized to continuous helicopter disturbance and as a result the impacts of helicopter flight paths in bighorn sheep habitat can be cumulative (Bleich, et al., 1990, Stockwell and Bateman 1991).

Sierra Nevada bighorn sheep, therefore, could potentially be affected by use of helicopters during periods of construction where flights are more frequent (e.g., during construction at Gem Dam) because repeated disturbances are more likely to affect this species. In order to minimize the potential for disturbance of Sierra Nevada bighorn sheep, flight paths (shown in Map A-1) have specifically been routed to avoid Critical Habitat for Sierra Nevada bighorn sheep. These paths were designed in coordination with resource agencies for past construction work required at Rush Meadows Dam (SCE 2017). Implementation of construction measures will further minimize the potential for disturbance effects to Sierra Nevada bighorn sheep. This includes Standard Construction Measures that limit the timing and extent of work activities; implementing worker environmental awareness training regarding special-status species potentially present and applicable measures required to avoid and minimize effects; and General Wildlife Measures that include stop-work protocols that are required if special-status species (including Sierra Nevada bighorn) are observed and may potentially be affected by

Project facility modification or restoration activities. Refer to Appendix 5-B for the full language of each of these measures.

Considering that agency consultation indicates that Sierra Nevada bighorn sheep are unlikely to be present in the Project area; and with implementation of construction measures, the proposed Project facility modification activities may affect, but are not likely to adversely affect Sierra Nevada big horn sheep.

*INDIRECT EFFECTS*

As described previously, the proposed Project facility modifications and restoration activities are located outside of federally designated Critical Habitat and are not located on lands currently utilized by Sierra Nevada bighorn sheep. Therefore, the Project facility modifications would have no effect on Sierra Nevada bighorn sheep by affecting their habitats.

*Considering direct and indirect effects to Sierra Nevada bighorn sheep described above, proposed construction/restoration activities **may affect, but are not likely to adversely affect** the species. Over the long-term, the removal of Project facilities and associated restoration would result in an overall benefit to the species.*

***SIERRA NEVADA RED FOX***

*DIRECT EFFECTS*

Sierra Nevada red foxes are not known to occur in the Project area but could potentially occur in the vicinity of the proposed work areas, staging areas, and worker camp sites. The nearest observations are two 2019 camera trap observations southwest of Waugh Lake near Rogers Lake and Marie Pass (Hatfield et al. 2021, 2023; Julia Lawson, pers. comm.) Implementation of proposed Project facility modification and restoration activities could result in the following effects to Sierra Nevada red fox if present:

- Construction and repeated helicopter flights may result in temporary disturbance.
- The proposed Project facility modifications require excavation of holes and trenches in which small mammals could become entrapped.
- Trash and debris left unsecured in the construction areas or in the worker camp sites (e.g., the Frontier Pack Station Camp or in the alternative worker housing) may attract scavenging mammals such as Sierra Nevada red fox.

The potential for temporary disturbance, entrapment in excavations, and attraction of scavengers will be minimized through implementation of Standard Construction Measures that impose limitations on the timing and location of work; General Wildlife Measures that require excavations be covered at night and/or installation of escape ramps; and the Forest Service Special Use Permit, which requires use of bear-proof containers to store food, camping, personal supplies; and containment and regular transportation of garbage off-site (i.e., by pack mules or by helicopter). In addition, SCE will implement worker environmental awareness training regarding special-status or game mammals potentially present and construction measures that will minimize potential for effects. This includes stop-work protocols (General Construction Measures) to be implemented in the case that special-status animals are observed at the site that may potentially be affected by work activities. Refer to Appendix 5-B for the full language of each of these measures.

With the incorporation of construction measures, proposed Project facility modifications and restoration may affect, but are not likely to adversely affect Sierra Nevada red fox.

*INDIRECT EFFECTS*

The restoration of the former lakebeds and the historic streambed of Rush Creek would improve potential habitat for Sierra Nevada red fox in the long term by increasing habitat heterogeneity within the former lakebeds. For example, rather than a deep reservoir that provides marginal foraging habitat, the former lakebeds would likely return to stream, meadow, riparian and wetland habitats. An increase in meadow habitat would provide increase potential foraging opportunities for Sierra Nevada red fox. With the removal of Rush Meadows Dam from the FERC Project boundary, periodic disturbances within the Ansel Adams Wilderness from long-term operations and maintenance would no longer occur. Therefore, in the long-term, the Proposed Action is expected to increase the amount of habitat and improve habitat connectivity.

*Considering direct and indirect effects to Sierra Nevada red fox described above, proposed construction/restoration activities **may affect, but are not likely to adversely affect** the species. Over the long-term, the removal of Project facilities and associated restoration would result in an overall benefit to Sierra Nevada red fox.*

***NORTH AMERICAN WOLVERINE***

*DIRECT EFFECTS*

There are no documented occurrences of North American wolverine in the Project area, but they may potentially occur in the talus slopes and rugged terrain surrounding the construction areas. The nearest known detection of wolverine is from the north shore of Thousand Islands Lakes, just south of the Project area (Julia Lawson, pers. comm.). Implementation of proposed Project facility modification and restoration activities could result in the following effects to wolverines, if present in the vicinity of proposed work areas, staging areas, and worker camp sites:

- Construction and repeated helicopter flights may result in temporary disturbance of wolverine (e.g., flushing).

- The proposed Project facility modifications require excavation of holes and trenches in which small mammals could become entrapped.

- Trash and debris left unsecured in the construction areas or in the worker camp sites (e.g., the Frontier Pack Station Camp or in the alternative worker housing) may attract scavenging mammals such as North American wolverine.

The potential for temporary disturbance, entrapment in excavations, and attraction of scavengers will be minimized through implementation of Standard Construction Measures that impose limitations on the timing and location of work; General Wildlife Measures that require excavations be covered at night and/or installation of escape ramps; and the Forest Service Special Use Permit, which requires use of bear-proof containers to store food, camping, personal supplies; and containment and regular transportation of garbage off-site (i.e., by pack mules or by helicopter). In addition, SCE will implement worker environmental awareness training regarding special-status or game mammals potentially present and construction measures that will minimize potential for effects. This includes stop-work protocols (General Construction Measures) to be implemented in the case that special-status animals are observed at the site that may potentially be affected by work activities. Refer to Appendix 5-B for the full language of each of these measures.

With the incorporation of construction measures, proposed Project facility modifications and restoration may affect, but are not likely to adversely affect wolverine.

*INDIRECT EFFECTS*

The restoration of the former lakebeds and the historic streambed of Rush Creek would improve potential habitat for wolverine in the long term by increasing habitat heterogeneity within the former lakebeds. For example, rather than a deep reservoir that provides marginal foraging habitat, the former lakebeds would likely return to stream, meadow, riparian and wetland habitats, providing a greater diversity of both aquatic and upland habitats. Because of its relatively shallow elevation, some portions of the former lakebed within Waugh Lake would likely return to a meadow system, which provides high quality foraging habitat for wolverine. With the removal of Rush Meadows Dam from the FERC Project boundary, periodic disturbances within the Ansel Adams Wilderness from long-term operations and maintenance would no longer occur. Therefore, in the long-term, the Proposed Action is expected to increase the amount of habitat and improve habitat connectivity for wolverine.

*Considering direct and indirect effects to wolverine described above, proposed construction/restoration activities **may affect, but are not likely to adversely affect** the species. Over the long-term, the removal of Project facilities and associated restoration would result in an overall benefit to wolverine.*

## Other Special-status Mammals and Game Mammals

Other special-status mammals that may potentially occur in the Project area include Sierra Nevada snowshoe hare (*Lepus americanus tahoensis*), western white-tailed jackrabbit (*Lepus townsendii townsendii*), Sierra Nevada mountain beaver (*Aplodontia rufa californica*), Sierra martin (*Martes caurina sierrae*), American badger (*Taxidea taxus*), and ringtail (*Bassariscus astutus*). In addition, the analysis area also contains suitable habitat for a variety of game mammals (e.g., gray fox [*Urocyon cinereoargenteus*], black bear [*Ursus americanus*]), as defined in Section 8.5, Table 8.5-6.

*DIRECT EFFECTS*

Implementation of proposed Project facility modification and restoration activities could result in the following effects to other special-status mammals and game mammals potentially present in the vicinity of proposed work areas, staging areas, and worker camp sites:

- Construction and repeated helicopter flights may result in temporary disturbance effects to special-status or game mammals (e.g., flushing).
- The proposed Project facility modifications require excavation of holes and trenches in which small mammals could become entrapped.
- Trash and debris left unsecured in the construction areas or in the worker camp sites (e.g., the Frontier Pack Station Camp or in the alternative worker housing) may attract scavenging mammals such as Sierra Nevada red fox, North American wolverine, or game mammals such as bears or coyotes.

The potential for temporary disturbance, entrapment in excavations, and attraction of scavengers will be minimized through implementation of Standard Construction Measures that impose limitations on the timing and location of work; General Wildlife Measures that require excavations be covered at night and/or installation of escape ramps; and the Forest Service Special Use Permit, which requires use of bear-proof containers to store food, camping, personal supplies; and containment and regular transportation of garbage off-site (i.e., by pack mules or by helicopter). In addition, SCE will implement worker environmental awareness training regarding special-status or game mammals potentially present and construction measures that will minimize potential for effects. This includes stop-work protocols (General Construction Measures) to be implemented in the case that animals are observed at the site that may potentially be affected by work activities. Refer to Appendix 5-B for the full language of each of these measures.

With the incorporation of construction measures, the potential for direct effects to special-status mammals and game mammals from implementation of proposed Project facility modification and restoration activities would be minimized and considered negligible.

*INDIRECT EFFECTS*

The restoration of the former lakebeds and the historic streambed of Rush Creek would improve potential habitat for other special-status mammals and game mammals in the long-term by increasing habitat heterogeneity within the former lakebeds. For example, rather than a deep reservoir that provides marginal foraging habitat, the former lakebeds would likely return to stream, meadow, riparian and wetland habitats with a wider range of water depths and flow conditions, providing a greater diversity of both aquatic and upland habitats. With the removal of Rush Meadows Dam from the FERC Project boundary, periodic disturbances within the Ansel Adams Wilderness from long-term operations and maintenance would no longer occur. Therefore, in the long-term, the Proposed Action is expected to increase the amount of habitat and improve habitat connectivity for both special-status and game mammals.

### 9.2.4.5 Construction Measures

To avoid or reduce impacts to botanical and wildlife resources during construction, SCE will obtain, prepare, and/or implement the following measures. A complete list of construction measures is included in Section 5, Appendix 5-B.

- Standard construction measures
- Water quality measures
- Hazardous materials measures
- General wildlife measures
- Special-status plant measures
- Riparian measures
- Special-status amphibian measures
- Special-status raptor measures
- Other special-status bird measures
- Special-status bat measures
- Applicable resource agency and construction permits
- Forest Service water quality best management practices

### 9.2.4.6 Unavoidable Adverse Effects

There are no unavoidable adverse effects to botanical and wildlife resources under the Proposed Action.

### 9.2.4.7 References

Anderson, B.A. 2007. A Literature Review of the Effects of Helicopter Disturbance and Noise on Selected Wildlife Species.

Bleich, V.C., R.T. Bowyer, A.M. Pauli, R.L. Vernoy, and R.W. Anthes. 1990. Responses of mountain sheep to aerial sampling using helicopters. California Fish and Game, 76(4).

Bleich, V.C., R.T. Bowyer, A.M. Pauli, M.C. Nicholson, and R.W. Anthes. 1994. Mountain sheep *Ovis canadensis* and helicopter surveys: Ramifications for the conservation of large mammals. Biological Conservation, 70(1), 1-7.

Lips, K.R. 2016. Overview of chytrid emergence and impacts on amphibians. Phil. Trans. R. Soc. B 371: 20150465.

SCE (Southern California Edison Company). Biological Assessment and Biological Evaluation, Rush Meadows Dam Modifications, Rush Creek Hydroelectric System Runoff Management Project. December 2017.

———. 2024a. Draft TERR 1 – Botanical Resources Technical Study Report. August. Available in Supporting Document A of the Application for New License.

———. 2024b. Draft TERR 2 – Wildlife Resources Technical Study Report. August. Available in Supporting Document A of the Application for New License.

———. 2024c. Draft AQ 7 – Special-Status Amphibians Technical Study Report. August. Available in Supporting Document A of the Application for New License.

Stockwell, C.A., and G.C. Bateman. 1991. Conflicts in national parks: A case study of helicopters and bighorn sheep time budgets at the Grand Canyon. Biological Conservation, 56(3), 317-328.

USFWS (United States Fish and Wildlife Service). 2016. Designation of Critical Habitat for the Sierra Nevada Yellow-Legged Frog, the Northern Distinct Population Segment of the Mountain Yellow-Legged Frog, and the Yosemite Toad; Final Rule (FR, Vol. 81, No. 166, Pages 59046–59119), August 26, 2016.

White, C.M., and S.K. Sherrod. 1973. Advantages and Disadvantages of the Use of Rotor-Winged Aircraft in Raptor Surveys. Raptor Research, Vol 7 (3/4), pp 97–104.

## Table of Contents

Page

9.2.5 Geology and Soils – Construction Effects ..... 9.2.5-1
- 9.2.5.1 Soil Erosion ..... 9.2.5-1
- 9.2.5.2 Soil Contamination ..... 9.2.5-2
- 9.2.5.3 Construction Measures ..... 9.2.5-3
- 9.2.5.4 Unavoidable Adverse Effects ..... 9.2.5-3

## List of Acronyms

| | |
|---|---|
| Project | Rush Creek Project |
| SCE | Southern California Edison Company |

### 9.2.5 Geology and Soils – Construction Effects

This section describes the potential construction-related effects to geology and soils that could occur because of Project facility modifications to be implemented under the Proposed Action for Southern California Edison Company's (SCE) Rush Creek Project (Project). A description of Project facility modifications, including restoration activities, to be implemented under the Proposed Action is included in Section 5 and Appendix 5-A.

For purposes of addressing soil effects, this section considers only the potential for erosion outside of the Rush Creek channel and channel banks. In-channel and streambank construction effects are discussed in Section 9.2.6, Geomorphology – Construction Effects.

Potential effects are determined by analyzing the changes in geology and soils that may result from activities to be implemented under the Proposed Action compared to the No-Action Alternative (existing condition) (Section 4). Final effects determinations consider construction measures included to avoid or mitigate impacts associated with construction activities (refer to Section 5, Appendix 5-B). Unavoidable adverse effects are discussed at the end of this section.

The following potential effects to geology and soils because of Project facility modifications were evaluated:

- Potential soil impacts due to water and wind erosion as a result of grading, vegetation removal, and other ground-disturbing activities.
- Potential soil impacts resulting from an accidental spill of fuels or other toxic materials used for maintaining and operating heavy equipment.

#### 9.2.5.1 Soil Erosion

Under the Proposed Action, implementation of Project facility modification and restoration activities could temporarily increase soil erosion as a result of ground disturbance during construction activities. In addition, grading, vegetation removal, and other ground-disturbing activities could increase the susceptibility of soils to water and wind erosion. Such activities include the partial removal of Rush Meadows Dam and Agnew Dam, the retrofitting of Gem Dam, staging and equipment storage, construction and removal of worker housing, and ground disturbance associated with restoration activities.

Terrain around the Waugh, Gem, and Agnew lakes, particularly at the dam sites where construction would occur is steep and rocky, with minimal soil development. Soil types are complexes intermixed with bedrock outcropping (Rock outcrop-Typic Cryorthents complex) (refer to Section 8.6, Map 8.6-6). Vegetation is at most, widely scattered lodgepole pines and willow. Consequently, there are limited areas with developed soils that could be disturbed during construction activities. Within the lakebeds near the dams, there are no soils, only weathered granitic sands and rocky substrate that have been transported from other parts of the watershed or nearby slopes that have deposited within the reservoir footprint.

Field observations show that there is natural regeneration of vegetation occurring on the formerly inundated surfaces in Waugh lakebed that were exposed as a result of seismic restrictions on water surface elevations. This revegetation process is likely to continue, which will help minimize exposed lakebed deposit erosion. In addition to natural processes, site-specific restoration plans will be implemented following removal of Rush Meadows and Agnew dams to reduce the potential for erosion and sedimentation. The objectives of the restoration plans include:

- Stabilization of areas upstream and downstream of the former dam sites, as appropriate, to prevent erosion.
- Restoration of work areas, staging areas, campsites, and areas where project-support facilities were removed.
- Revegetation and stabilization of sediment in the former Waugh and Agnew lakebeds in the active construction areas behind the dams, as necessary.
- Reestablishment and stabilization of Rush Creek within the former Waugh and Agnew lakebeds immediately behind the deconstructed dam sites, as necessary.
- Restoration of riparian and wetland vegetation in the former Waugh lakebed.

Restoration activities would occur over a single season and would include measures to protect soils and minimize erosion. Following implementation of the restoration plan, a 5-year monitoring period would be implemented to evaluate success of the initial restoration effort. Additional restoration activities may be needed depending on monitoring results.

To minimize effects of construction-related soil erosion, SCE will implement measures during construction and restoration activities, including development of an erosion control plan; implementing soil stabilization and best management practices to minimize soil erosion; limiting construction areas to the minimum area necessary to implement activities; and operating equipment only when soil compaction, displacement, erosion, and sediment runoff would be minimized. Refer to Appendix 5-B for the full language of each of these measures.

Implementation of construction measures and restoration plans would protect soil resources and minimize soil erosion during and following implementation of Project facility modifications and restoration activities; therefore, impacts are considered negligible.

#### 9.2.5.2 Soil Contamination

Under the Proposed Action, implementation of Project facility modification and restoration activities could impact soils as a result of an accidental spill of fuels or other toxic materials used for construction activities or for maintaining and operating heavy equipment. To minimize effects of construction-related soil contamination as a result of accidental spill, SCE will implement measures during construction and restoration activities, including development of a spill prevention, control and countermeasure plan; implementing secondary containment measures around refueling equipment; implementing appropriate debris disposal measures; and storing hazardous materials in labeled and chemical compatible containers in accordance with federal, state, and local regulations. Refer to Appendix 5-B for the full language of each of these measures.

Implementation of construction measures would protect soil resources and prevent soil contamination during implementation of Project facility modification and restoration activities; therefore, impacts are considered negligible.

#### 9.2.5.3 Construction Measures

To avoid or reduce impacts to geology and soils during construction, SCE will obtain, prepare, and/or implement the following measures. A complete list of construction measures is included in Section 5, Appendix 5-B.

- Erosion Control Plan
- Spill Prevention, Control, and Countermeasure Plan
- Standard construction measures
- Hazardous materials measures
- Applicable resource agency and construction permits
- Forest Service water quality best management practices

#### 9.2.5.4 Unavoidable Adverse Effects

There are no unavoidable adverse effects to geology and soils as a result of Project facility modification and restoration activities to be implemented under the Proposed Action.

## TABLE OF CONTENTS

Page

9.2.6 Geomorphology – Construction Effects ..................... 9.2.6-1
9.2.6.1 Erosion and Sedimentation to the Channel Resulting from Construction Activities ..................... 9.2.6-1
9.2.6.2 Construction Measures ..................... 9.2.6-5
9.2.6.3 Unavoidable Adverse Effects ..................... 9.2.6-5
9.2.6.4 References ..................... 9.2.6-5

## LIST OF ACRONYMS

| | |
|---|---|
| cfs | cubic feet per second |
| PMF | probable maximum flood |
| Project | Rush Creek Project |
| SCE | Southern California Edison Company |
| SWPPP | Stormwater Pollution Prevention Plan |

### 9.2.6 Geomorphology – Construction Effects

This section describes the potential construction-related effects to geomorphology that could occur because of Project facility modifications to be implemented under the Proposed Action for Southern California Edison Company's (SCE) Rush Creek Project (Project). A description of Project facility modifications, including restoration activities, to be implemented under the Proposed Action is included in Section 5 and Appendix 5-A.

Potential effects are determined by analyzing the changes in geomorphology that may result from activities to be implemented under the Proposed Action compared to the No-Action Alternative (existing condition) (Section 4). Final effects determinations consider construction measures included to avoid or mitigate impacts associated with construction activities (refer to Appendix 5-B). Unavoidable adverse effects are discussed at the end of this section.

The following potential effects to geomorphology associated with Project facility modifications were evaluated:

- Erosion and sedimentation to the channel resulting from the following construction activities.
    - Staging and Stockpile Areas
    - Excavation and Fill
    - Dewatering Activities
    - Temporary Access Routes
    - Temporary Installation of Infrastructure

#### 9.2.6.1 Erosion and Sedimentation to the Channel Resulting from Construction Activities

Under the Proposed Action Rush Meadows and Agnew dams would be removed and Gem Dam would be retrofitted to facilitate compliance with the seismic restrictions under a probable maximum flood (PMF) event with a new spillway and reduced dam height. Project facility modifications to be implemented under the Proposed Action could result in changes to hydrology that affect geomorphology. Project facility modification and restoration activities are summarized below, followed by specific construction activities that could affect erosion and sedimentation.

Modifications to Rush Meadows Dam include:

- Construction of a notch in the center of Rush Meadows Dam, sized to pass the PMF (approximately 6,500 cubic feet per second [cfs]), without water impoundment (Appendix 5-A, Map A-1).

Modifications to Agnew Dam include:

- Demolishing the center three arches of Agnew Dam to pass the PMF (approximately 8,400 cfs) without any water impoundment (Appendix 5-A, Map A-2).

Modifications to Gem Dam include:

- Removal of the upper portions of Arches No. 10 to No. 14 to develop a new ungated ogee spillway to pass the estimated PMF (8,700 cfs) with a crest elevation corresponding to the top of the existing gravity infill section, elevation 9,027.5 feet (consistent with current seismic restrictions) (Appendix 5-A, Map A-3).

Site-specific restoration activities include:

- Stabilization of areas upstream and downstream of the former dam sites (i.e., Rush Meadows and Agnew dams), as appropriate, to prevent erosion.

- Restoration of work areas, staging areas, campsites, and areas where project-support facilities were removed.

- Revegetation and stabilization of sediment in the former Waugh and Agnew lakebeds and former Gem Lake inundation zone, as necessary.

- Reestablishment and stabilization of Rush Creek within the former Waugh and Agnew lakebeds, as necessary.

- Restoration of the channel, and riparian and wetland vegetation in the former Waugh lakebed.

**Staging and Stockpile Areas**

Activities associated with the establishment of construction staging and storage areas, such as grading, stockpiling materials, etc., have the potential to temporarily convey sediments into the channel and flood prone areas. Erosion could cause sediment delivery resulting in sedimentation. During the establishment of construction staging and storage areas sediment would be disturbed to create workable ground surfaces. Disturbed areas have potential to erode on a temporary basis during construction activities and can be transported by storm runoff events into waterways. Ground surface modifications for the establishment of construction areas include footings for construction storage and fuel storage areas, portable restrooms, construction offices, equipment staging, laydown areas, stockpile areas, potential worker housing, and helicopter landing sites (see Appendix 5-A).

Preliminary construction work areas have been identified for each Project facility modification (see Appendix 5-A, Maps A-2, A-3, and A-4). Staging and storage areas are primarily designated on the upstream side of the dam in the dry lake beds. Measures to minimize or mitigate potential impacts of staging and storage areas are identified in Appendix 5-B and include preparation and implementation of an Erosion Control Plan and

Stormwater Pollution Prevention Plan (SWPPP); obtaining applicable resource agency and construction permits; and implementation of water quality best management practices.

With implementation of construction measures and site-specific restoration plans, the temporary establishment and use of staging and stockpile areas associated with Project facility modifications would have a negligible effect on erosion or potential channel sedimentation.

**Excavation and Fill**

Excavation and fill activities have the potential to temporarily erode and deliver sediment to the channel as a result of unstable slopes, toppling of unstable material, and from storm event runoff. Excavation and fill activities include deconstruction and modification of existing dams, construction of access features along the downstream end of the dams, removal of temporary access fill, and the construction of abutment slopes (see Appendix 5-A).

Large, piled construction debris elevated above a channel poses the potential to cause erosion which could result in temporary channel diversion or channel blockage. Geomorphic alterations would vary based on the size and quantity of material deposited, but could result in sediment deposition, channel diversion, bank erosion, or flooding downstream and within construction areas. Excavation and fill activities would be minimized in waterways and flood prone areas. Measures to minimize or mitigate potential impacts of excavation and fill activities are identified in Appendix 5-B and include preparation and implementation of an Erosion Control Plan and SWPPP; obtaining applicable resource agency and construction permits; and implementation of water quality best management practices.

With implementation of construction measures identified above and in Appendix 5-B, temporary excavation and fill activities associated with Project facility modifications would have a negligible effect on erosion or potential channel sedimentation.

**Dewatering Activities**

Installation of dewatering infrastructure has the potential to cause temporary sedimentation through the installation of cofferdams and by placement of the discharge pipe. Clear water diversion systems using cofferdams and high-density polyethylene/polyvinyl chloride piping would be used to dewater the construction area 100–200 feet upstream and downstream of the Rush Meadows and Agnew dams. Small portable pumps would also be used to reduce ponding within the construction area and pump water into settling ponds on the upstream side of the dam before returning the water back to the channel (see Appendix 5-A). Ground penetration, excavation, construction and water diversion associated with the installation of a cofferdam could cause an increase in turbidity, sedimentation, and instability of the local channel bed and banks. Flows from the outlet discharge pipe could cause channel scour and sediment transport downstream of the discharge location.

Measures to minimize or mitigate potential impacts of dewatering activities are identified in Appendix 5-B and include preparation and implementation of a Dewatering and Diversion Plan, Erosion Control Plan, Water Quality Monitoring Plan, and SWPPP; obtaining applicable resource agency and construction permits; compliance with turbidity and sediment (suspended sediment load and suspended sediment discharge) criteria identified the Water Quality Control Plan for Mono Lake Basin (CRWQCB 2021) for dewatering activities; and implementation of water quality best management practices.

With implementation of construction measures identified above and in Appendix 5-B, temporary dewatering activities associated with Project facility modifications would have a negligible effect on erosion or potential channel sedimentation.

**Temporary Access Routes**

Temporary access routes for foot and vehicle traffic, over time, can destabilize slopes and deliver sediment into waterways or flood prone areas. Significant erosion could lead to channel diversion or channel blockages, altering the direction of flow and accelerating erosion and deposition of sediment. Measures to minimize or mitigate potential impacts of temporary access routes are identified in Appendix 5-B and include preparation and implementation of an Erosion Control Plan; obtaining applicable resource agency and construction permits; and implementation of water quality best management practices.

With implementation of construction measures identified above and in Appendix 5-B, temporary access routes associated with Project facility modifications would have a negligible effect on erosion or potential channel sedimentation.

**Temporary Structures**

Ground disturbance as a result of installation of temporary structures to support construction activities has the potential to result in erosion. Temporary structures would primarily be installed in the dry lakebeds upstream of the dam and construction would primarily occur in the dewatered areas of the Rush Creek channel. Measures to minimize or mitigate potential impacts of temporary structures are identified in Appendix 5-B and include preparation and implementation of an Erosion Control Plan; obtaining applicable resource agency and construction permits; and implementation of water quality best management practices.

With implementation of construction measures identified above and in Appendix 5-B, temporary structures associated with Project facility modifications would have a negligible effect on erosion or potential channel sedimentation.

### 9.2.6.2 Construction Measures

To avoid or reduce impacts to geomorphology (erosion and channel sedimentation), SCE will obtain, prepare, and/or implement the following measures. A complete list of construction measures is included in Section 5, Appendix 5-B.

- Water Quality Monitoring Plan
- Erosion Control Plan
- Dewatering and Diversion Plan
- Stormwater Pollution Prevention Plan
- Applicable resource agency and construction permits
- Forest Service water quality best management practices

### 9.2.6.3 Unavoidable Adverse Effects

There are no unavoidable adverse effects to geomorphology as a result of Project facility modifications to be implemented under the Proposed Action.

### 9.2.6.4 References

CRWQCB (California Regional Water Quality Control Board) Lahontan Region. 2021. Water Quality Control Plan for the Lahontan Region, North and South Basins (Basin Plan). Revised September 2021. Available at: https://www.waterboards.ca.gov/lahontan/water_issues/programs/basin_plan/references.html.

## TABLE OF CONTENTS

Page

9.2.7 Wetland, Riparian, and Littoral Resources – Construction Effects ............. 9.2.7-1
9.2.7.1 Project Reservoirs ........................................................................ 9.2.7-2
9.2.7.2 Project-Affected Stream Reaches ..................................................... 9.2.7-5
9.2.7.3 Construction Measures ..................................................................... 9.2.7-8
9.2.7.4 Unavoidable Adverse Effects ............................................................ 9.2.7-8
9.2.7.5 References ........................................................................................ 9.2.7-9

## LIST OF ACRONYMS

| | |
|---|---|
| cfs | cubic feet per second |
| Forest Service | United States Forest Service |
| MIF | minimum instream flows |
| NNIP | non-native invasive plant |
| Project | Rush Creek Project |
| SCE | Southern California Edison Company |

### 9.2.7 Wetland, Riparian, and Littoral Resources – Construction Effects

This section describes the potential construction-related effects to wetland, riparian, and littoral resources that could occur because of Project facility modifications to be implemented under the Proposed Action for Southern California Edison Company's (SCE) Rush Creek Project (Project). A description of Project facility modifications, including restoration activities, to be implemented under the Proposed Action is included in Section 5 and Appendix 5-A.

Potential effects are determined by analyzing the changes in wetland, riparian, and littoral resources that may result from activities to be implemented under the Proposed Action compared to the No-Action Alternative (existing condition) (Section 4). Final effects determinations consider construction measures included to avoid or mitigate impacts associated with construction activities (refer to Section 5, Appendix 5-B). Unavoidable adverse effects are discussed at the end of this section.

Wetland, riparian, and littoral resources discussed in this section are connected to and/or influenced by the hydrology of Project-affected stream reaches and Project reservoirs. As described in Section 8.8, Wetland, Riparian and Resources Affected Environment, these habitats are associated with floodplains and littoral zones. 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.

Potential effects to wetland, riparian, and littoral habitats resulting from construction-related activities (including restoration) were evaluated as follows:

**Potential Effects to Wetland, Riparian, and Littoral Habitats**

- Potential effects to wetland, riparian, and littoral habitats associated with Project reservoirs, including:
  - Direct removal, trimming or burial of wetland, riparian, and littoral habitat as a result of ground disturbance associated with construction or restoration activities.
  - Degradation of wetland, riparian, and littoral habitat resulting from the introduction or spread of non-native invasive plants (NNIP).
  - Beneficial effects to wetland, riparian, and littoral habitat resulting from restoration of the former lakebeds/inundation zones of Project reservoirs.
- Potential effects to riparian habitat associated with Project-affected stream reaches, including:
  - Direct removal, trimming or burial of riparian habitat as a result of ground disturbance associated with construction or restoration activities.

- Degradation of riparian habitat resulting from the introduction or spread of NNIPs.
- Indirect effects to riparian habitats resulting from degradation of water quality from dewatering, increased erosion and sedimentation, and hazardous materials spills potentially resulting from construction and restoration activities.
- Beneficial effects to riparian habitats along Project-affected stream reaches from riverbed restoration and hydrology to be implemented under the Proposed Action.

Potential effects of the Project facility modifications and restoration activities on flows in Project-affected stream segments are discussed in Section 9.2.1, Water Use and Hydrology – Construction Effects. Potential effects on riparian-dependent plants and wildlife species are provided in Section 9.2.4, Botanical and Wildlife Resources – Construction Effects. Potential effects on channel morphology and sediment processes are discussed in Section 9.2.6, Geomorphology – Construction Effects.

This section relies on information obtained during botanical resource studies conducted in 2023 as part of relicensing (SCE 2024).

### 9.2.7.1 Project Reservoirs

This section evaluates potential direct and indirect effects of the proposed Project facility modification and restoration activities on wetland, riparian, and littoral habitats associated with Waugh Lake, Gem Lake, and Agnew Lake.[1] The discussion considers both effects within floodplains (i.e., along streams that are tributary to the reservoirs), as well as littoral zones along the reservoirs themselves. For this analysis, the littoral zone is defined as the margins or areas upslope of the inundated areas of the Project reservoirs.

The analysis area for direct and indirect effects to wetland, riparian, and littoral habitats associated with Project reservoirs includes the construction and restoration work areas, staging areas, and worker housing sites located within or along the shoreline of the reservoirs upstream of the dams.

#### Direct Effects

This section evaluates the potential for direct effects (e.g., removal, trimming, or burial) to riparian habitat as a result of proposed Project facility modification or restoration activities. As described in Section 8.8, there are 0.68 acre of riparian habitat along Waugh Lake; 0.94 acre of riparian habitat along Gem Lake; and 2.68 acres of riparian habitat along Agnew Lake. For the most part, these habitats consist of willow shrubland alliance vegetation that is growing within the floodplains of tributary streams that drain into the reservoirs. At Agnew Lake, patches of willow shrubland alliance have also become established within the littoral zone along the margin of the reservoir itself. No wetland

[1] Silver Lake would not be affected by the proposed Project facility modification and restoration activities and therefore is not discussed in this section.

habitats (e.g., littoral emergent wetlands) were mapped along the margins of the Project reservoirs (SCE 2024).

The construction areas within Waugh Lake and Agnew Lake would be located on dewatered portions of the reservoir bed and immediately adjacent shorelines. At Gem Lake, a large portion of the work area is located within the wetted reservoir (i.e., work would be conducted from a barge or from the top of the dam), and the staging, laydown, and storage areas would be located on dry reservoir bed adjacent to the wetted area. These work areas and staging areas are underlain by granite outcropping, sandy reservoir bed, and/or water; and are mostly barren of vegetation or support only patchy herbaceous vegetation. There is no wetland, riparian, or littoral habitat mapped within the reservoir work areas and staging areas. Therefore, the proposed Project facility modifications would not directly affect wetland, riparian, or littoral habitat associated with the Project reservoirs.

Within a year of completion of construction at each of the Project reservoirs, SCE will implement restoration plans that require restoration of construction work areas, staging areas, access routes, campsites, and areas where facilities have been removed; stabilization of areas upstream and downstream of the remaining portions of the dams to prevent erosion; revegetation and stabilization of sediment in the former lakebeds/inundation zones; and reestablishment and stabilization of the historic creek channel (Rush Creek) within the lakebeds, as necessary. These restoration activities may require ground disturbance in the lakebeds/inundation zones beyond the defined construction work areas described previously. This is particularly true for Waugh Lake, which may require more extensive ground disturbance for recontouring and stabilization of the lakebed, as well as the former creek channel within the lakebed. There is some potential for direct impacts to riparian vegetation as a result of these activities. Impacts to riparian habitat from implementation of the restoration plans would be temporary and limited to the minimum amount necessary to meet plan objectives. Restoration activities will also include revegetation, including revegetation with riparian species, as appropriate. In addition, it is expected that removal/retrofitting of the dams, and subsequent restoration, will result in an overall increase in and benefit to riparian, wetland, and littoral habitats over time.

The potential for direct impacts to riparian vegetation resulting from proposed Project facility modification and restoration activities would be further minimized through implementation of Standard Construction Measures that limit the location and extent of ground disturbing work activities and require implementation of a worker environmental awareness training, which will include information on riparian habitats and associated avoidance and protection measures, and General Wildlife Measures that require SCE to obtain agency permits, including Lake/Streambed Alteration Agreements for each project. All conditions of the permits, including those for the protection of riparian vegetation, would be implemented as part of the Project. SCE will also implement Riparian Measures, which state that riparian vegetation trimming will be limited to the minimum necessary; and that all other riparian vegetation would be flagged for avoidance.

Considering that the proposed Project facility modification activities would not affect riparian habitats; that restoration activities may temporarily affect riparian vegetation but would result in an overall increase in abundance of riparian, wetland, and littoral habitats over time; and with implementation of construction measures, the proposed Project facility modification and restoration activities would have a neutral to beneficial effect on riparian habitats.

**Indirect Effects**

Indirect effects to riparian, wetland, and littoral habitats associated with Project reservoirs include degradation of habitat resulting from the introduction or spread of NNIPs; and benefits from restoration of former lakebeds/newly exposed inundation zones. Each of these effects are described below.

Transport to and use of ground-disturbing construction vehicles and equipment within the remote construction work and staging areas, and foot traffic associated with construction activities could result the spread of previously established NNIPs or introduce new NNIPs into the construction and restoration areas. NNIPs could, in turn, result in degradation of riparian habitats. The potential for the introduction or spread of NNIPs would be minimized through implementation of Non-Native Invasive Plant Measures that require cleaning of equipment prior to transport to construction work areas and staging areas; maintenance of stockpiles in a weed-free state; inspections of equipment and clothing followed by removal/disposal of weed seed; and use of certified weed-free erosion control materials.

NNIPs could also become established in the former lakebeds or inundation zones over the period of restoration. Therefore, restoration areas will be monitored for the presence of NNIPs. If new NNIP populations are identified, the populations will be treated, as appropriate. Finally, as described in Standard Construction Measures, construction personnel will receive training regarding NNIPs and associated construction measures as part of the required worker environmental awareness training. With implementation of measures, the potential for degradation of riparian habitats associated resulting from the introduction or spread of NNIPs at Project reservoirs would be negligible.

As stated previously, SCE will implement restoration plans within a year of completion of construction within the former lakebeds/exposed inundation zones and the historic streambed of Rush Creek. Natural vegetation communities have been shown to spontaneously recolonize exposed reservoir beds, at times even more successfully than targeted planting and seeding efforts (McCaffery et al. 2020, Prach et al. 2018).

- At Waugh Lake, the former lakebed would be returned to natural unimpaired conditions. The Rush Creek channel would be restored within the former lakebed, which would have a beneficial effect on hydrology (refer to Section 9.2.1). The floodplain adjacent to the restored creek channel is, in turn, expected to support a diverse mix of meadow (including wet meadow), riparian, and forest habitats.

- Because Agnew Dam does not currently impound water, Project facility modifications implemented under the Proposed Action would not result in any changes to the pre-project natural lake that exists under current conditions.

Restoration of the exposed inundation zone around the natural lake is expected to have a beneficial effect on wetland, riparian, and littoral habitats along the margin of the lake.

- After completion of retrofitting of Gem Dam (including construction of the new spillway and reduced dam height), the current maximum allowable water surface elevation of the lake, 9,027.5 feet, would remain unchanged. Similar to Agnew Dam, restoration of the exposed inundation zone around the natural lake is expected to have a beneficial effect on wetland, riparian, and littoral habitats along the margin of the lake.

Implementation of restoration plans would, therefore, have a long-term benefit on riparian, wetland, and littoral habitats associated with Project reservoirs.

### 9.2.7.2 Project-Affected Stream Reaches

This section evaluates potential direct and indirect effects of the proposed Project facility modification and restoration activities on riparian resources within the floodplain of Project-affected stream reaches.

The analysis area for direct and indirect effects to riparian habitats along Project-affected stream reaches includes the defined work areas, staging areas and worker housing sites located along Rush Creek below Rush Meadows Dam, Gem Dam, and Agnew Dam. It also includes the extent of Rush Creek below the dams that may be indirectly affected by dewatering, transport of sediment, or hazardous materials as a result of construction and restoration activities.

#### Direct Effects

Construction work areas, staging areas and worker housing sites located along Rush Creek below the dams are located primarily on rock outcrops that support minimal or no vegetation. Based on a review of aerial maps showing the location of vegetation in relation to proposed construction areas, riparian vegetation may potentially be affected at the following locations:

- Placement of temporary bridges and establishment of equipment access routes along the downstream side of the dam, as well as placement of cement (from the demolition of the dam) for reinforcement downstream of the remaining abutments could potentially affect up to a maximum of 0.29 acre of *Salix orestera* Shrubland Alliance at Rush Meadows Dam.

- Placement of temporary bridges and establishment of equipment access routes along the downstream side of the dam, as well as placement of cement (from the demolition of the dam) for reinforcement downstream of the remaining abutments could potentially affect up to a maximum of 0.03 acre of *Salix exigua* Shrubland Alliance at Agnew Dam.

- Removal of the Agnew Dam to Agnew Junction Flowline along Rush Creek below the dam may require the removal/trimming of up to a maximum of 0.07 acre of *Populus tremuloides* Forest Alliance[2] and 0.05 acre of *Salix lasiolepis* Shrubland Alliance. *Populus tremuloides* Forest Alliance (i.e., quaking aspen) is also considered a sensitive natural community by the California Department of Fish and Wildlife (CDFW) (CDFW 2023).

As described previously, SCE will implement Riparian Measures, which state that riparian vegetation trimming will be limited to the minimum necessary; and that all other riparian vegetation will be flagged for avoidance. Implementation of applicable Standard Construction Measures and General Wildlife Measures (e.g., that limit the timing and extent of work activities and require implementation of worker environmental awareness training) would also be implemented. Finally, the restoration plans will require restoration of areas where facilities (e.g., the Agnew Dam to Agnew Junction Flowline) have been removed and will include revegetation, including planting of riparian species, as appropriate. Over time, the removal/retrofitting of dams and subsequent restoration activities are expected to result in an overall benefit to riparian habitats along Rush Creek below the dams. Therefore, direct effects to riparian would be negligible.

**Indirect Effects**

Indirect effects to riparian habitats associated with Rush Creek below Rush Meadows Dam, Gem Dam, and Agnew Dam include degradation of habitat resulting from the introduction or spread of NNIPs; indirect degradation of habitat from dewatering, erosion and sedimentation, hazardous materials or other construction-related effects to water quality; and benefits from restoration. Each of these potential effects are described below.

As described previously, the proposed Project facility modification and restoration activities could potentially result in spread of existing NNIPs or introduce new NNIPs into the construction and restoration areas which could, in turn, result in degradation of riparian habitats in the floodplains of Rush Creek. Refer to the discussion of indirect effects to riparian habitats at Project reservoirs for a description of NNIP-related effects and associated construction measures that would be implemented to minimize the potential for the introduction or spread of NNIPs. With implementation of measures, the potential for degradation of riparian habitats resulting from the introduction or spread of NNIPs along Rush Creek below the dams would be negligible.

Prior to removal of Rush Meadows and Agnew dams, a cofferdam and water bypass system would be installed to direct water from Rush Creek around and downstream of the work area to keep the work area dry and maintain minimum instream flows (MIF) within Rush Creek below the dams. Gem Dam would not be dewatered and MIFs would be maintained as they are under the No-Action Alternative (existing conditions). Dewatering of Waugh Lake and Agnew Lake, and ground disturbance at all three locations during implementation of construction and restoration activities could result in

[2] For the purposes of this analysis, aspen is considered a riparian alliance. While aspen can occur on upland sites, in the analysis area it is typically associated with Rush Creek or other creek drainages.

temporary degradation of water quality in Rush Creek downstream of the dams through increased erosion and sedimentation; or through release of hazardous materials including fuels or other chemicals. The potential for construction-related degradation of water quality would be minimized through development and implementation of a Dewatering and Diversion Plan. Implementation of Water Quality Measures, Hazardous Materials Measures, and applicable United States Forest Service (Forest Service) Water Quality Best Management Practices would further minimize the potential for water quality impacts. These measures include, but are not limited to, implementation of an Erosion Control Measures Plan, secondary containment measures around refueling equipment, appropriate debris disposal measures, and limiting construction areas to minimum area necessary to complete construction. In addition, SCE will obtain all required permits prior to implementation of activities within the ordinary high water mark or bed and bank of Waters of the U.S. All conditions required under the permits will be implemented as part of the Project facility modification and restoration activities. Refer to Appendix 5-B for the full language of each of these measures. Implementation of measures would minimize potential construction-related water quality effects.

Following completion of construction and restoration, removal of Rush Meadows Dam would restore connectivity between Rush Creek upstream and downstream of the former lake. MIF requirements would be discontinued, and natural, unimpaired flows would be re-established in Rush Creek downstream of the dam. In the short term, release of sediment could potentially result in temporary effects to riparian vegetation within Rush Creek below the former lake/dam, if high flows carry sediment that buries riparian vegetation. Sediment releases into Rush Creek below Gem Dam and Rush Creek below Agnew Lake (natural lake) are expected to be negligible, therefore this potential effect is expected only downstream of Waugh Lake. As described in Section 9.3.7, Wetland, Riparian, and Littoral Habitats – Operation and Maintenance Effects, the effects of sediment release following dam removal are typically limited to the year immediately following dam removal (Shafroth et al. 2016). Furthermore, implementation of restoration plans and associated stabilization of construction work areas and the Rush Creek channel within the former lakebed would minimize release of post-dam removal sediments.

In the long-term, removal of Rush Meadows Dam and restoration of natural flows is expected to increase the diversity of riparian vegetation as a result of occasional scouring of the channel during high-flow events and a return to natural sediment transport dynamics that facilitate recruitment of seedlings. Over time, the diversity of riparian species, age structure, and interannual distribution is expected to increase compared to the No-Action Alternative (Shafroth et al. 2016).

Under the Proposed Action, MIF requirements below Gem Dam would include a continuous minimum flow of 1 cubic foot per second (cfs) (or natural inflow if the level of Gem Lake falls below the face of the dam) in Rush Creek below Gem Dam (United States Geological Survey Gage 10287281; SCE 352 R) and 1 cfs (or natural inflow if the level of Gem Lake falls below the face of the dam) below Agnew Lake (natural lake), as measured at the flume gage (USGS 10287289; SCE 357).

While MIFs below Gem Dam and below Agnew Lake are consistent with the No-Action Alternative (i.e., no change), with removal of Rush Meadows Dam, there would be an increase in the frequency and magnitude of natural high flow events in Rush Creek. Under the No-Action Alternative, Waugh Lake temporarily stores water when inflows exceed the capacity of the low-level outlets, which moderates natural peak flows in Rush Creek below Rush Meadows Dam. Under the Proposed Action, flows entering Gem Lake would be unimpaired and higher during peak flow events. Natural high flow releases and spills from Gem Dam into Rush Creek, therefore, would also be higher and/or more frequent under the Proposed Action. More frequent natural high flow releases may benefit wetland, riparian, and littoral habitats in Rush Creek below Gem Dam as a result of more frequent channel scouring that could allow recruitment and establishment of riparian seedlings.

With implementation of construction measures, indirect effects to riparian in Project-affected stream reaches would be short-term and negligible. Over the long term, the flow regime to be implemented under the Proposed Action is expected to have a neutral to beneficial effect on riparian within the floodplains along Rush Creek, with effects varying depending on the geomorphology and other site-specific factors of the reach. Refer to Section 9.3.7 for a detailed discussion of the long-term effects to riparian along Rush Creek from ongoing operation and maintenance of the Project.

#### 9.2.7.3 Construction Measures

To avoid or reduce impacts to wetland, riparian and littoral habitat during construction, SCE will obtain, prepare, and/or implement the following measures. A complete list of construction measures is included in Section 5, Appendix 5-B.

- Standard construction measures
- Water quality measures
- Dewatering and Diversion Plan
- Hazardous materials measures
- General wildlife measures
- Riparian measures
- Forest Service water quality best management practices

#### 9.2.7.4 Unavoidable Adverse Effects

There are no unavoidable adverse effects to wetland, riparian, and littoral resources under the Proposed Action.

### 9.2.7.5 References

CDFW (California Department of Fish and Wildlife). 2023. California Sensitive Natural Communities. June 1, 2023.

McCaffery, R., K.J. Jenkins, S. Cendejas-Zarelli, P.J. Happe, and K.A. Sager-Fradkin. 2020. Small mammals and ungulates respond to and interact with revegetation processes following dam removal. Food Webs 25: e00159.

Prach, K., J. Chenoweth, and R. del Moral. 2018. Spontaneous and assisted restoration of vegetation on the bottom of a former water reservoir, the Elwha River, Olympic National Park, WA, U.S.A. Restoration Ecology 27(3):592 –599.

SCE (Southern California Edison Company). 2024. Draft TERR 1 – Botanical Resources Technical Study Report. August. Available in Supporting Document A of the Application for New License.

Shafroth, P.B., L.G. Perry, C.A. Rose, and J.H. Braatne. 2016. Effects of dams and geomorphic context on riparian forests of the Elwha River, Washington. Ecosphere 7(12): e01621.

## TABLE OF CONTENTS

Page

9.2.8 Land Use – Construction Effects ... 9.2.8-1
9.2.8.1 Potential Effects of Undertaking Construction Activities in the Ansel Adams Wilderness ... 9.2.8-1
9.2.8.2 Potential Effects of Using the June Mountain Ski Area Parking Lot as the Base of Operations ... 9.2.8-2
9.2.8.3 Potential Effects to Land Use Resulting from Removal of Project Facilities ... 9.2.8-2
9.2.8.4 Construction Measures ... 9.2.8-3
9.2.8.5 Unavoidable Adverse Effects ... 9.2.8-3
9.2.8.6 References ... 9.2.8-4

## LIST OF ACRONYMS

| | |
|---|---|
| Forest Service | United States Forest Service |
| LMP | Land Management Plan |
| MRA | Minimum Requirements Analysis |
| Project | Rush Creek Project |
| ROS | Recreation Opportunity Spectrum |
| SCE | Southern California Edison Company |
| SUP | Special Use Permit |

### 9.2.8 Land Use – Construction Effects

This section describes the potential construction-related effects to land use that could occur because of Project facility modifications to be implemented under the Proposed Action for Southern California Edison Company's (SCE) Rush Creek Project (Project). A description of Project facility modifications, including restoration activities, to be implemented under the Proposed Action is included in Section 5 and Appendix 5-A.

Potential effects are determined by analyzing the changes in land use that may result from activities to be implemented under the Proposed Action compared to the No-Action Alternative (existing condition) (Section 4). Final effects determinations consider construction measures included to avoid or mitigate impacts associated with construction activities (refer to Section 5, Appendix 5-B). Unavoidable adverse effects are discussed at the end of this section.

The following potential effects to land use associated with Project facility modifications were evaluated:

- Potential effects associated with undertaking construction activities in the Ansel Adams Wilderness.
- Potential effects associated with using the June Mountain Ski Area Parking Lot as the Base of Operations.
- Potential effects to land use associated with removal of Project facilities.

#### 9.2.8.1 Potential Effects of Undertaking Construction Activities in the Ansel Adams Wilderness

Construction and restoration activities at Rush Meadows Dam, Waugh Lake, and Gem Lake would take place within the Ansel Adams Wilderness. These Project facilities were constructed before Congress' establishment of the Ansel Adams Wilderness (as well as before the establishment of the Minarets Wilderness, which preceded the Ansel Adams Wilderness). During the prior Project relicensing in the 1990s, both the Federal Energy Regulatory Commission and the United States Forest Service (Forest Service) accepted those Project facilities in the Ansel Adams Wilderness as "non-conforming uses" because they were built before Congress' establishment of the wilderness.

To avoid and reduce potential impacts to lands within the Ansel Adams Wilderness, a Minimum Requirements Analysis (MRA) will be prepared to support Forest Service issuance of a Wilderness Act Variance for work within the wilderness area. The MRA process, written into Section 4(c) of the Wilderness Act, is used to help preserve wilderness character and promote sound wilderness stewardship. To apply the MRA framework, a two-step process is used to determine (1) whether the proposed management action is appropriate or necessary for administration of the area as wilderness and does not cause a significant impact to wilderness resources and character, in accordance with the Wilderness Act and (2) the techniques and types of equipment needed to ensure that impacts on wilderness resources and character are minimized (NPS 2024).

Impacts to lands within the Ansel Adams Wilderness resulting from Project facility modifications are considered negligible with completion of the MRA and implementation of conditions contained within the Wilderness Act Variance to be issued by the Forest Service.

#### 9.2.8.2 Potential Effects of Using the June Mountain Ski Area Parking Lot as the Base of Operations

June Mountain Ski Area Parking Lot, located on Forest Service lands, is proposed for use as a Base of Operations for construction activities. To legally occupy and use June Mountain Ski Area Parking Lot as a Base of Operations, SCE will submit an application to the Forest Service for a Special Use Permit (SUP). SCE has previously obtained a SUP for this location to support Project operation and maintenance activities. Consistent with requirements in the SUP, the Base of Operations would be established at the beginning of each construction season and demobilized and/or winterized at the end of each construction season (June 1 to October 31).

Potential impacts associated with use of June Mountain Ski Area Parking Lot are considered negligible with acquisition of an SUP from the Forest Service and adherence to conditions contained within the SUP.

#### 9.2.8.3 Potential Effects to Land Use Resulting from Removal of Project Facilities

Project facility modifications to be implemented under the Proposed Action include partial removal of Rush Meadows and Agnew dams. The center sections of each dam would be removed; however, the abutments of both dams would remain (refer to Appendix 5-A). The remaining abutments would be periodically inspected for the first five years following dam removal activities. Once the abutments are determined to be stable, periodic inspections would no longer be required, and they would be removed from the FERC Project boundary. SCE would obtain a SUP from the Forest Service to retain the abutment on Forest Service lands.

Following implementation of Project facility modifications, SCE would file revised Exhibit G maps to formally remove lands from the FERC Project boundary that will no longer be necessary for operation and maintenance of the Project (refer to Exhibit G). Project facility modifications would occur on land under the jurisdiction of the Forest Service. Once FERC approves the revised Exhibit G maps, the Project boundary change would become effective, and the Forest Service would assume full managerial responsibility for the areas formerly within the FERC Project boundary around Agnew Lake and Waugh Lake. There would be a small reduction to the FERC Project boundary around Gem Lake as a result of the lower maximum reservoir water surface elevation.

Rush Meadows Dam is in the Ansel Adams Wilderness and is a “non-conforming use” within the wilderness. While the dam abutments would remain after Project facility modifications, removing Rush Meadows Dam would improve alignment of the landscape with Forest Service desired conditions for wilderness areas as described in the Inyo National Forest Land Management Plan (LMP) (Forest Service 2019) and in the 1964 Wilderness Act.[1] Agnew Dam is located within an area designated by the Inyo National Forest LMP as Recreation Opportunity Spectrum (ROS) land class “semi-primitive nonmotorized.” Agnew Dam and ancillary facilities are generally not well aligned with the conditions, objectives, standards, guidelines and goals of the Inyo National Forest LMP for the “semi-primitive nonmotorized” land class.[2] While the dam abutments would remain after Project facility modifications, removing Agnew Dam would improve alignment of the landscape with the applicable ROS land class for the area. Following removal of Project facilities, the Forest Service would assume responsibility for managing all areas formerly within the FERC Project boundary in accordance with the Inyo National Forest LMP and through issuance of a SUP to SCE for the remaining abutments. Overall, removal of Project facilities from the Inyo National Forest would be a beneficial effect to land use.

#### 9.2.8.4 Construction Measures

To avoid or reduce impacts to land use during construction, SCE will implement the following measures. A complete list of construction measures is included in Section 5, Appendix 5-B.

- Prepare a Minimum Requirements Analysis (MRA) for work within the wilderness
- Obtain a Forest Service Special Use Permit (SUP) for construction activities at June Mountain Ski Area Parking Lot and remaining dam abutments

#### 9.2.8.5 Unavoidable Adverse Effects

There are no unavoidable adverse effects to land use as a result of Project facility modifications to be implemented under the Proposed Action.

---

[1] Desired conditions for all designated wilderness areas within the Inyo National Forest include preserving and when possible, enhancing the qualities of untrammeled, natural, undeveloped, opportunities for solitude or primitive recreation, and other features of value (such as ecological, geological, or other features of scientific, educational, scenic, cultural or historical value specific to each wilderness area) (Forest Service 2019).

[2] The physical setting of the “semi-primitive nonmotorized” land class is one that is “predominately natural/natural appearing; rustic improvements to protect resources.” The social setting of the semi-primitive nonmotorized land class is one where there is a “high probability of solitude, closeness to nature, self-reliance high to moderate challenge and risk; some evidence of others.” (Forest Service 2019)

### 9.2.8.6 References

Act of September 3, 1964 (P.L. 88-577, 78 Stat. 890 as amended; 16 U.S.C. 1131(note), 1131-1136).” Referred to as the "Wilderness Act”. Available online at: https://www.nps.gov/subjects/wilderness/upload/W-Act_508.pdf.

Forest Service (United States Forest Service). 2019. Land Management Plan for the Inyo National Forest. Available at: https://www.fs.usda.gov/main/inyo/landmanagement/planning

NPS (National Park Service). Minimum Requirements Analysis: Resource Brief. Updated January 31, 2024. Available online at: https://www.nps.gov/subjects/wilderness/upload/NPS-MRA-Resource-Brief_508.pdf

## TABLE OF CONTENTS

Page

9.2.9 Recreation Resources – Construction Effects ........................................... 9.2.9-1
9.2.9.1 Potential Effects to Use of Developed Day-Use and Camping Facilities in the Vicinity of the Project Facility Modifications ............... 9.2.9-2
9.2.9.2 Potential Effects to Dispersed Recreation Opportunities and Use in the Vicinity of the Project Facility Modifications.................................. 9.2.9-5
9.2.9.3 Potential Effects to Reservoir-based Recreation Opportunities Resulting from Removal of Project Facilities...................................... 9.2.9-8
9.2.9.4 Potential Effects to Recreation Opportunities Resulting from Retrofitting Gem Dam ........................................................................ 9.2.9-8
9.2.9.5 Construction Measures .................................................................... 9.2.9-9
9.2.9.6 Unavoidable Adverse Effects ........................................................... 9.2.9-9
9.2.9.7 References......................................................................................... 9.2.9-9

## LIST OF ACRONYMS

| | |
|---|---|
| Forest Service | United States Forest Service |
| Project | Rush Creek Project |
| SCE | Southern California Edison Company |
| SR-158 | State Route 158 |
| TSP | Technical Study Plan |
| US-395 | United States Route 395 |

### 9.2.9 Recreation Resources – Construction Effects

This section describes the potential construction-related effects to recreation resources that could occur because of Project facility modifications to be implemented under the Proposed Action for Southern California Edison Company's (SCE) Rush Creek Project (Project). A description of Project facility modifications, including restoration activities, to be implemented under the Proposed Action is included in Section 5 and Appendix 5-A.

Potential effects are determined by analyzing the changes to recreation resources that may result from activities to be implemented under the Proposed Action compared to the No-Action Alternative (existing condition) (Section 4). Final effects determinations consider construction measures included to avoid or mitigate impacts associated with construction activities (refer to Section 5, Appendix 5-B). Unavoidable adverse effects are discussed at the end of this section.

The following potential effects to recreation resources associated with Project facility modifications were evaluated:

- Potential effects to use of developed day-use and camping facilities in the vicinity of Project facility modifications.
- Potential effects to dispersed recreation opportunities and use in the vicinity of Project facility modifications, including:
  - Hiking, backpacking, and trail running
  - Backcountry camping
  - Commercial pack use
  - Fishing
  - Water recreation
- Potential effects to reservoir-based recreation opportunities resulting from removal of Project facilities.
- Potential effects to reservoir-based recreation opportunities resulting from retrofitting Gem Dam.

This section relies on data collected as part of the REC 1 – Recreation Technical Study Plan (TSP) and LAND 2 – Noise TSP.

#### 9.2.9.1 Potential Effects to Use of Developed Day-Use and Camping Facilities in the Vicinity of the Project Facility Modifications

Developed recreation facilities in the vicinity of the Project are depicted on Map 8.10-2 and generally occur along State Route 158 (SR-158) along the June Lake Loop.

The areas of focused construction activity are the work areas at each of the dam sites (Rush Meadows Dam, Gem Dam, and Agnew Dam), and the June Mountain Ski Area Parking Lot (Base of Operations), which is located along SR-158. The nearest dam construction site to a developed recreation facility is Agnew Dam which is 2.0 uphill miles from Silver Lake Picnic Area. At this distance, on-site construction activities would not impact recreationists at any developed day-use or camping facilities.

The Base of Operations would serve as a hub of construction activity on the valley floor. The Base of Operations would include a construction trailer, helicopter landing site, use of supporting construction equipment, and staging and stockpile areas. The closest day-use and camping facilities to the Base of Operations are the Reversed Creek Campground and the Gull Lake Campground, approximately 0.26-mile and 0.5-mile east, respectively, from the Base of Operations along SR-158. The nearest facility along SR-158 to the west is the Silver Lake Picnic Area, which is approximately 2.0 miles from the Base of Operations.

The specific construction activities that could potentially affect day-use and camping facilities are vehicle traffic and helicopter flights to and from the Base of Operations and to and from the Rush Creek Powerhouse, and increased pack animal activity at the Frontier Pack Station. Refer to Section 5, Appendix 5-A for details related to construction activities and maps depicting the location of helicopter flight paths and construction areas.

**Vehicle Traffic**

Truck traffic entering/departing the Base of Operations would travel along SR-158 to the northern intersection with United States Route 395 (US-395) passing Silver Lake and several recreation facilities along its western shore. Therefore, the developed day-use and camping facilities near Silver Lake have the greatest potential of experiencing effects associated with increased volumes of truck traffic on SR-158. Refer to Appendix 5-A, Tables A-3, and A-4 (Rush Meadows), A-6 and A-7 (Agnew), and A-10 and A-11 (Gem) for information related to the number of anticipated truck trips. There would also be intermittent increases in worker vehicle traffic entering and exiting the powerhouse area.

The greatest volume of Project-created traffic is associated with the retrofit of Gem Dam – when as many as 24 truck roundtrips per day may pass along SR-158. This would occur between June 1 and October 31 (construction season) for three years. However, this additional truck traffic would represent only a small increase in the current traffic along SR-158 near Silver Lake. Based on the most recently available northbound and southbound vehicle count data from the California Department of Transportation (Caltrans 2022) from three postmile locations along SR-158 (North Shore Drive, Silver Lake Campground, and Grant Lake Junction/ northern SR-158/US-395 junction) an average of

1,147 vehicles travel southbound on SR-158 each day when the road is open (summer season), and an average of 975 vehicles travel northbound.[1] Therefore, the addition of as many as 24 truck roundtrips per day (as many as 48 individual truck trips), would only represent a small increase (approximately 2 percent increase southbound and 2.5 percent increase northbound) in total vehicle trips experienced by visitors to day-use areas and campgrounds near Silver Lake. The overall volume of truck trips associated with removal of Rush Meadows Dam and Agnew Dam is less – a maximum of about 10 truck roundtrips per day associated with the Rush Meadows Dam (one construction season) and about three truck roundtrips per day associated with Agnew Dam (one construction season).

The small increase in trucks travelling along SR-158 between the June Mountain Ski Area Parking Lot and the Grant Lake Junction during Project facility modifications would not result in adverse traffic impacts to developed recreation facilities; any effects on traffic associated with these trucks trips would be further reduced with implementation of a Traffic Management Plan described in Section 9.2.16. The Traffic Management Plan will include the following types of measures to avoid or minimize impacts from truck traffic:

- Temporary traffic control
- Traffic control signage
- Scheduling vehicle trips to off-peak hours as much as practicable
- Worker carpooling, where possible

**Helicopter Flights**

Under current conditions, recreationists are occasionally exposed to helicopters flying to and from the powerhouse for routine operation and maintenance of Project facilities. Under the Proposed Action, additional helicopter flights departing from and returning to the Base of Operations would expose recreationists to more helicopter flights. Specifically, an average of six round trip helicopter flights per day[2] are anticipated during each construction season. Helicopter trips would be flown by heavy-duty helicopters (e.g., Skycrane) during mobilization (approximately 2 weeks) and demobilization (approximately 2 weeks); and by smaller medium and light-duty helicopters (e.g., ASTAR and Blackhawk). Flights from the Base of Operations would head west and southwest, away from the recreation facilities near Gull Lake and the town of June Lake and towards the construction areas at each dam. Refer to Appendix 5-A, Map A-1 for an illustration of the helicopter flight paths. Refer to Appendix 5-A, Tables A-3 and A-4 (Rush Meadows),

[1] The daily average northbound and southbound traffic counts were approximated by calculating the total average of (1) the daily northbound Caltrans Traffic Program Census counts and (2) the daily southbound Caltrans Traffic Program Census counts at each of the three postmile markers along the reach of highway between Northshore Drive (just north along SR-158 of the June Mountain Ski Area Parking Lot) and the northern junction of SR-158 with US-395 (also referred to as the Grant Lake Junction).

[2] Six flights per day is the expected average number of flights on any one construction day.

A-6 and A-7 (Agnew), and A-10 and A-11 (Gem) for information related to the number of anticipated helicopter trips.

The proximity of some day-use and camping facilities to the Base of Operations and helicopter flight paths may expose recreationists to views of helicopters and would expose recreationists to temporary and intermittent noise from helicopters. Exposure would, exceed a maximum noise level ($L_{max}$)[3] of 60 dB at nearly all lodging and recreation facilities between the northern shoreline of June Lake to the inlet of Grant Lake when heavy-duty (Skycrane) helicopters are flying. When the smaller helicopters are flying, a smaller area, encompassing Gull Lake to the Rush Creek Powerhouse, would be exposed to a $L_{max}$ of 60 dB or above. Developed camping and day-use facilities exposed to a $L_{max}$ of 60 dB or above regardless of which type of helicopter is flown include the Reversed Creek Campground, Gull Lake Campground; Gull Meadows Car Top Boat Launch; Golden Pine RV Park and the Gull Lake Marina. Refer to Section 9.2.15 for a more detailed discussion of noise exposure associated with helicopters and to Map 9.2.15-2 for a geographic illustration of single-event exposure from helicopter noise sources.

The exposure to views of, and noise from, helicopters would be an increase from exposure under the No-Action Alternative. The increase in visual and audio exposure to helicopters during Project facility modifications would be minimized with implementation of the noise measures described in Section 9.2.15 but would not be fully mitigated. In summary, implementation of Project facility modifications may expose recreationists at developed recreation facilities to views of helicopters and would expose recreationists at multiple camping and day-use recreation facilities to elevated noise compared to noise under the No-Action Alternative. Exposure to helicopter noise, though limited in duration, would be a temporary adverse effect at developed day-use and camping facilities in the vicinity of the Project.

**Frontier Pack Station Activities**

Project facility modifications would necessitate the use of as many as 1,185 trips by mule in a single construction season (the greatest number of mule trips are associated with the retrofit of Gem Dam). Refer to Appendix 5-A, Tables A-3 (Rush Meadows), A-6 (Agnew), and A-10 (Gem) for information related to the number of anticipated mule trips. Mules would be used to carry personnel and equipment from the Rush Creek Trailhead to staging areas at the dam construction sites. Mules are expected to be staged at the Frontier Pack Station, located at the base of the Rush Creek Trailhead (west side of SR-158 on the north end of Silver Lake). Pack trips using mules would start, as they do currently, at the Rush Creek Trailhead and follow the Rush Creek Trail up to the construction sites. The Rush Creek Trailhead is proximate to the Silver Lake Resort, Silver Lake Campground, and Silver Lake Boat Launch. Visitors and operators of these facilities may experience odors and fugitive dust associated with increased quantities of mules at the Frontier Pack Station and at the Rush Creek Trailhead.

[3] Maximum Sound Level ($L_{max}$) represents the highest sound level measured during a single event in which the sound changes with time. $L_{max}$ is the maximum level that occurs over a fraction of a second.

Mule trips associated with implementation of Project facility modifications would potentially expose visitors and operators at developed recreation facilities near the Frontier Pack Station to pack animals, and to adverse effects associated with pack animals – including odors and fugitive dust. This would be a temporary adverse effect.

### 9.2.9.2 Potential Effects to Dispersed Recreation Opportunities and Use in the Vicinity of the Project Facility Modifications

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 Federal Energy Regulatory Commission Project boundary. The Rush Creek Trail (non-Project trail) is a major access route to the Ansel Adams Wilderness, Yosemite National Park, John Muir Trail, and Pacific Crest Trail. Agnew, Gem and Waugh lakes, and the surrounding area offer excellent opportunities for dispersed outdoor recreation.

#### Hiking, Backpacking and Trail Running

Project facility modifications are expected to require the temporary and intermittent closure of sections of the Rush Creek Trail and may also require the temporary and intermittent closure of side trails that extend from the Rush Creek Trail including the Clark Lakes Trail, Spooky Meadows Trail, and Weber Lake Trail (refer to Map 8.10-2 for the location of these trails). Trail closures would be needed to accommodate transport of equipment and ensure worker and visitor safety. The timing and duration of the closures would be determined by the United States Forest Service (Forest Service) in consultation with SCE and are anticipated to vary depending on the phase of and location of construction. Trail closures would reduce recreational opportunities in the vicinity of the Project and could inconvenience trail users hiking, backpacking or running. Inconveniences are not limited to visitors seeking backcountry access by way of the Rush Creek Trailhead but may also be associated with disruption to the planned itinerary of hikers and backpacker's entering the Rush Creek drainage from other trails (e.g., the John Muir Trail – a portion of the Pacific Crest Trail).

Recreation along trails may also be impacted by fugitive dust emissions from construction activities; viewsheds of active construction sites; and noise generated by construction activities in backcountry areas. In addition, while pack animals (mules and horses) currently utilize the Rush Creek Trail throughout the summer, sometimes daily,[4] during those phases of construction that require significant mule trips (i.e., those phases associated with retrofitting Gem Dam) there would be more use of the Rush Creek Trail by pack animals than under typical existing conditions. Dust, disrupted viewsheds, noise, and frequent encounters with pack animals are experiences that can diminish trail users' recreational quality and overall enjoyment of the backcountry.

[4] Frontier Pack Train provides commercial mule pack trips into the Ansel Adams Wilderness from the Rush Creek Trailhead under a special-use permit from the Inyo National Forest. The special-use permit specifies a commercial use quota of 15 people per day which means up to 15 people may ride a horse up the trail (with additional support by mules) each day.

The construction measures identified below, including early consultation with the Forest Service and ongoing public outreach and communication during the active construction period, would provide recreationists with advanced notice of trail closures to the extent possible, and also alert visitors to the construction activities planned. These measures would allow recreationists to plan around expected trail closures – thereby reducing inconveniences associated with unexpected closures; and would also allow recreationists to make informed decisions about whether to plan trips along the Rush Creek Trail (when it is open) with knowledge of the construction activities they might encounter. However, despite these measures, it is reasonable to assume that some recreationists would be unpleasantly surprised and potentially inconvenienced by the closures and/or construction activities encountered. Noise exposure would exceed a single-event maximum noise level ($L_{max}$) of 80 dB along portions of the Fern Lake Trail and Yost Lake Trail, as well as at some sections of the Rush Creek Trail (near the dam construction areas) during a helicopter fly-over. Exposure to helicopter noise, though limited in duration, would be a temporary adverse effect. In addition, trail closures, even if intermittent, reduce the total availability of recreation opportunities in the vicinity of the Project compared to No-Action Alternative.

Implementation of Project facility modifications would have a temporary adverse effect on hiking, backpacking, and trail running.

**Backcountry Camping**

As described above, construction activities are expected to require the temporary and intermittent closure of sections of the Rush Creek Trail and may also require the temporary and intermittent closure of side trails that extend from the Rush Creek Trail, including the Clark Lakes Trail, Spooky Meadows Trail, and Weber Lake Trail. These closures would reduce access to backcountry camping opportunities in the Rush Creek drainage, particularly for recreationists entering the backcountry from the Rush Creek Trailhead because the most popular backcountry campsites are along the western shoreline of Gem Lake (between Gem Lake and Cress Creek) upstream of Gem Dam, and up trail of those sections of the Rush Creek Trail where closures are most likely. Recreationists that are able to access campsites near Gem Lake upstream of Gem Dam are not likely to experience any impacts associated with construction activities because the backcountry campsites along the lake are more than a mile distant from any construction site and views of the dam are obstructed by topography. Likewise, visitors to backcountry camping locations at Waugh Lake are unlikely to experience any impacts associated with Project facility modifications because there are no identified camping locations near the dam. There are no identified backcountry camping locations near Agnew Lake.

Implementation of Project facility modifications would reduce access to backcountry camping opportunities in the vicinity of Project, a temporary adverse effect.

### Commercial Packer Use

As described above, construction activities are expected to require the temporary and intermittent closure of sections of the Rush Creek Trail. Frontier Pack Station provides commercial mule pack trips into the Ansel Adams Wilderness from the Rush Creek Trailhead under a special-use permit from the Forest Service. The magnitude of the impact to recreationists seeking pack trips into the High Sierra would be relative to the location, extent, and duration of trail closures. Early and ongoing public outreach (as described in Section 9.2.9.5 below) would help mitigate impacts by enabling recreationists seeking a commercial packer experience to plan for a trip in other locations, however, there are limited commercial packers operating on the east side of the Sierra Nevada and therefore a reduction in the availability of commercial trips into the backcountry would be a temporary adverse effect on recreation opportunities associated with commercial packer use.

Implementation of Project facility modifications would reduce the availability of commercial pack trips into the backcountry on the east side of the Sierra, a temporary adverse effect.

### Fishing

Based on survey data collected from anglers along the Rush Creek Trail between late May to early November of 2023 (SCE 2024) the most common fishing location upstream of the powerhouse is Gem Lake, however anglers surveyed reported fishing in all the major upstream waterbodies in the Rush Creek drainage including Rush Creek, Agnew, Gem, and Waugh lakes. Construction is expected to proceed sequentially (only one dam would be undergoing construction at any one time), and therefore only one major waterbody at a time would be impacted. At Rush Meadows Dam and at Agnew Dam, construction activity would likely disincentivize anglers from fishing in Rush Creek downstream or upstream of the dam to avoid exposure to construction. At Gem Dam, retrofitting activity would require drawing down the surface elevation of Gem Lake to approximately 9,000 feet (27.5 feet lower than the No-Action Alternative elevation). Drawing down Gem Lake may reduce accessible areas for recreational users, including anglers, to access the lakeshore. In addition, active construction would likely disincentivize anglers from fishing in Rush Creek immediately downstream of the dam. Finally, any closure of the Rush Creek Trail would limit access to fishing areas along Rush Creek and at other waterbodies accessible from the Rush Creek Trailhead during the period of closure. The Project is not expected to have any impact on fishing opportunities below the powerhouse.

Implementation of Project facility modifications would have a temporary adverse effect on fishing opportunities in the Rush Creek drainage upstream of the powerhouse.

### Water Recreation

Swimming and wading in Rush Creek and at Agnew and Gem lakes is an activity that some Rush Creek Trail users currently undertake when travelling into the backcountry. Restrictions at and around each of the dam sites during active construction would eliminate swimming opportunities near the dams. In addition, draw down of Gem Lake during retrofit of Gem Dam may reduce accessible areas for recreational users to access the lakeshore and would also reduce the desirability of Gem Lake as a location to swim. Since Rush Meadows Dam was notched, Waugh Lake doesn't often store enough water to allow recreationists to swim upstream of the dam, and therefore construction would not create a change in water recreation opportunities upstream. In addition, any closure of the Rush Creek Trail would limit access to water recreation within Rush Creek and at other waterbodies accessible from the Rush Creek Trailhead during the period of closure.

Implementation of Project facility modifications would have a temporary adverse effect on water recreation opportunities at Agnew Lake and Gem Lake.

#### 9.2.9.3 Potential Effects to Reservoir-based Recreation Opportunities Resulting from Removal of Project Facilities

Water recreation in Rush Creek, and Agnew and Waugh lakes is generally limited to wading and swimming activities. Under existing conditions, seismic restrictions have nearly eliminated the water in Waugh Lake and have changed the desirability of that lake as a water recreation destination. Under existing conditions Agnew Lake is only a small natural lake that pre-dates the Project (does not impound water). Agnew Lake, under existing conditions retains sufficient water for fishing and swimming.

Under the Proposed Action, SCE would remove Rush Meadows Dam such that it no longer impounds water (dam abutments would remain). As a result, Waugh Lake would be restored (upland, wetland, riparian communities) and the Rush Creek channel would be reestablished within the lakebed. Natural flows would also be reestablished in Rush Creek within the former lakebed and downstream of the former dam site. Following construction and restoration, the dam site and former lakebed would be restored to natural conditions.  Because Waugh Lake provides little or no reservoir-based recreation under the No-Action Alternative, removal of the dam and restoration of the site under the Proposed Action would result in no effect to reservoir-based recreation. However, removal of the dam would result in a change to stream-based recreation opportunities.

Under the Proposed Action, SCE would also remove Agnew Dam (dam abutments would remain). Because Agnew Dam does not currently impound water, Project facility modifications implemented under the Proposed Action would not result in any changes to the pre-project natural lake that exists under current conditions. Therefore, removal of Agnew Dam under the Proposed Action would have no effect on reservoir-based recreation.

#### 9.2.9.4 Potential Effects to Recreation Opportunities Resulting from Retrofitting Gem Dam

Under the Proposed Action, the upper portions of Arches No. 10 to No. 14 at Gem Dam would be removed to develop a new ungated spillway. The top 22 feet would be removed from the remaining dam arches and the top 10 feet of the vertical piers between Arches No. 1 to No. 9 would be removed. After retrofitting, Gem Dam would not extend as far above the surface water elevation of the lake, though the maximum allowable water surface elevation of the lake, 9,027.5 feet, would remain unchanged. As part of the Project facility modifications, the former inundation zone of Gem Dam, prior to the 2012 seismic restrictions, would be revegetated and stabilized, as necessary. The physical retrofitting of Gem Dam would have no effect on recreation. Refer to Section 9.2.9.2 for the effects of construction activities on recreation. Refer to Section 9.3.9, Recreation Resources – Operation and Maintenance Effects for a discussion of effects of Gem Dam operations on recreation resources.

#### 9.2.9.5 Construction Measures

To avoid or reduce impacts to developed and dispersed recreation use and opportunities in the vicinity of construction activities, SCE will implement the following measures. A complete list of construction measures is included in Section 5, Appendix 5-B.

- Conduct early consultation with the Forest Service
- Conduct public outreach and communication
- Coordinate with Frontier Pack Station
- Limit construction activities to designated work and staging areas
- Prepare a Traffic Management Plan
- Implement noise reduction measures

#### 9.2.9.6 Unavoidable Adverse Effects

Project facility modifications would have a temporary unavoidable adverse effect on recreation resources.

#### 9.2.9.7 References

Caltrans (California Department of Transportation). 2022. Traffic Census Program. Available online at: https://dot.ca.gov/programs/traffic-operations/census. Accessed April 2024.

SCE (Southern California Edison Company) 2024. Draft REC 1 – Recreation Technical Study Report. August. Available in Supporting Document A of the Application for New License.

## TABLE OF CONTENTS

Page

9.2.10 Aesthetic Resources – Construction Effects ........ 9.2.10-1
9.2.10.1 Potential Effects to Visual Resources during Construction Activities ........ 9.2.10-1
9.2.10.2 Potential Effects to Aesthetic Resources Resulting from Retrofitting Gem Dam ........ 9.2.10-3
9.2.10.3 Potential Effects to Aesthetic Resources Resulting from Removal of Rush Meadows and Agnew Dams and Associated Facilities ........ 9.2.10-3
9.2.10.4 Construction Measures ........ 9.2.10-5
9.2.10.5 Unavoidable Adverse Effects ........ 9.2.10-5
9.2.10.6 References ........ 9.2.10-5

## LIST OF ACRONYMS

| | |
|---|---|
| FERC | Federal Energy Regulatory Commission |
| Forest Service | United States Forest Service |
| Project | Rush Creek Project |
| SCE | Southern California Edison Company |
| SIO | Scenic Integrity Objective |
| SR-158 | State Route 158 |

### 9.2.10 Aesthetic Resources – Construction Effects

This section describes the potential construction-related effects to aesthetic resources that could occur because of Project facility modifications to be implemented under the Proposed Action for Southern California Edison Company's (SCE) Rush Creek Project (Project). A description of Project facility modifications, including restoration activities, to be implemented under the Proposed Action is included in Section 5 and Appendix 5-A.

Potential effects are determined by analyzing the changes in aesthetic resources that may result from activities to be implemented under the Proposed Action compared to the No-Action Alternative (existing condition) (Section 4). Final effects determinations consider construction measures included to avoid or mitigate impacts associated with construction activities (refer to Section 5, Appendix 5-B). Unavoidable adverse effects are discussed at the end of this section.

The following potential effects to aesthetic resources associated with Project facility modifications were evaluated:

- Potential effects to aesthetic resources due to the presence of construction work and staging areas at and around the following major construction work areas:
    - Rush Meadows Dam
    - Gem Dam
    - Agnew Dam
    - June Mountain Ski Area Parking Lot (Base of Operations)
- Potential effects to aesthetic resources resulting from retrofitting Gem Dam.
- Potential effects to aesthetic resources resulting from removal of Rush Meadows and Agnew dams and associated facilities.

#### 9.2.10.1 Potential Effects to Visual Resources during Construction Activities

At each construction site (Rush Meadows Dam, Gem Dam and Agnew Dam) a construction area would be established at the beginning of each construction season (approximately June 1 to October 31, depending on weather and snow conditions). Each dam construction site would include a medical kiosk, designated work area, staging areas, stockpile areas, and sanitation facilities. In addition, a construction area would be established at the June Mountain Ski Area Parking Lot (Base of Operations), which is located along State Route 158 (SR-158). The Base of Operations would also include the elements described above and additionally would include project management facilities, a helicopter landing site, and designated general parking. At the end of each construction season, construction areas would be demobilized and/or winterized. Winterization practices include removal of any temporary cofferdams, installation of temporary erosion control features, securing best management practice materials for the following year, and removal of construction equipment, fuel tanks, sanitary facilities, and secondary containment features. Refer to Section 5, Appendix 5-A for details related to construction activities, including equipment to be used at each site (Tables A-1, A-5, A-8, and A-12) and the location of construction areas (Maps A-1 through A-4).

Work at the Rush Meadows Dam, Gem Dam, Agnew Dam, and the Base of Operations would occur on National Forest Land under the jurisdiction of the United States Forest Service (Forest Service). Work at Rush Meadows Dam and Gem Lake would also occur within the Ansel Adams Wilderness Area.

Staging and work areas in the backcountry would introduce temporary structures, heavy equipment, fencing, and other materials that would contrast with the natural environment at each construction site. The construction sites at Agnew, Gem and Rush Meadows dams are visible from some public viewpoints along the Rush Creek Trail and other side trails that extend from the Rush Creek Trail. Equipment and materials used for construction include metal, concrete and high-visibility colors which are expected to stand out against the colors, textures, lines, and forms of the natural environment surrounding each dam. This contrast would draw the viewers' attention to the construction elements and reduce scenic quality. Additional effects to the visual environment may result from fugitive dust emissions caused by construction activities.

The Forest Service Scenic Integrity Objectives (SIO) for all lands within the Ansel Adams Wilderness is "Very High" and "High" for all other National Forest land within the vicinity of the Project (refer to Map 8.11-1). While accepted by the Forest Service as nonconforming uses, Project facilities already conflict with the Forest Service SIO of "Very High" and "High." The construction activities associated with the Project facility modifications would further detract from the Forest Service SIO for the area, creating additional visual intrusions that diminish the visual quality and character of the landscape. These temporary visual impacts would be limited to the active construction periods associated with each site: one season for Rush Meadows Dam, three seasons for Gem Dam, and one season for Agnew Dam.

The June Mountain Ski Area Parking Lot (Base of Operations) is an existing disturbed area that already includes industrial elements that contrast with the natural environment. However, the addition of equipment and materials associated with the implementation of Project facility modifications would introduce more visually intrusive elements to the setting, which may be intermittently visible to people traveling on SR-158 or from other public vantage points with views of the parking lot. This temporary visual impact would be limited to the duration of the construction periods associated with implementation of the Project facility modifications, a sequential total of approximately five years.

In summary, the visual quality and character of the landscape viewsheds where construction activities are occurring would be reduced compared to existing conditions (i.e., No-Action Alternative) during the periods of active construction. Therefore, implementation of Project facility modifications would have a temporary adverse effect on visual resources during construction activities.

### 9.2.10.2 Potential Effects to Aesthetic Resources Resulting from Retrofitting Gem Dam

Under the Proposed Action the upper portions of Arches No. 10 to No. 14 at Gem Dam would be removed to develop a new ungated spillway. The top 22 feet would be removed from the remaining dam arches and the top 10 feet of the vertical piers between Arches No. 1 to No. 9 would be removed. After retrofitting, Gem Dam would not extend as far above the surface water elevation of the lake, though the maximum allowable water surface elevation of the lake, 9,027.5 feet, would remain unchanged. As part of the Project facility modifications, the former inundation zone of Gem Dam, prior to the 2012 seismic restrictions, would be revegetated and stabilized, as necessary.

Under the Proposed Action, Gem Dam would be shorter than under the No-Action Alternative, however the character of the landscape viewshed would remain similar with little to no effect to the landscape character from viewpoints downstream. From upstream of the dam, the visual mass of the dam would comprise a smaller portion of the landscape from various viewpoints (refer to Key Observation Point 8 in the LAND 1 – Aesthetics Technical Study Report; SCE 2024; provided in Supporting Document A). The white geomembrane would be a less dominant element of the foreground and middle ground, and therefore the viewshed would be modestly improved. The dam would, however, still be obvious. The revegetation and stabilization of the former inundation zone would likely reduce the contrast between the water surface elevation and the line of vegetation several feet above the water surface elevation around its shore, though the lake would remain as a visually obvious reservoir with a defined “bathtub ring.”

Overall, retrofitting of Gem Dam would have a moderately beneficial effect to aesthetic resources compared to No-Action Alternative.

Post-construction visual renderings of Project facility modifications are included in Appendix C of the LAND 1 – Aesthetics Technical Study Report (SCE 2024).

### 9.2.10.3 Potential Effects to Aesthetic Resources Resulting from Removal of Rush Meadows and Agnew Dams and Associated Facilities

Following removal of Rush Meadows and Agnew dams and associated facilities and implementation of site-specific restoration plans, the Proposed Action would result in an overall benefit to visual resources as compared to the No-Action Alternative. A discussion of the benefits at each location are provided below. Post-construction visual renderings of Project facility modifications are included in Appendix C of the LAND 1 – Aesthetics Technical Study Report (SCE 2024).

**Waugh Lake**: Since 2012, as required by the Federal Energy Regulatory Commission (FERC), Waugh Lake has been limited to a maximum water surface elevation of 9,392.1 feet to meet seismic restrictions and alleviate safety concerns. The spillway was notched in 2018 to help facilitate compliance with the FERC-mandated reservoir elevation restrictions. Currently, Waugh Lake is not operated for storage, rather the low-level outlets on Rush Meadows Dam are left open so that inflow passes through the reservoir. During spring high flows, temporary storage occurs in the lake when the inflows exceed the capacity of the low-level outlets and the notched spillway. The aesthetics of the reservoir vary as the reservoir drains, with Waugh Lake appearing as a lake early in the season when runoff is high. As runoff from snowmelt wanes and the water surface elevation of the lake lowers, the viewshed changes to that of a lakebed of silty mud perforated by a meandering creek.

Under the Proposed Action, SCE would remove Rush Meadows Dam such that it no longer impounds water (dam abutments would remain). As a result, Waugh Lake would be restored (upland, wetland, riparian communities) and the Rush Creek channel would be reestablished within the lakebed. Natural flows would also be reestablished in Rush Creek within the former lakebed and downstream of the former dam site. Following construction and restoration, the dam site and former lakebed would be returned to natural conditions within the landscape resulting in an overall benefit to visual quality and character as compared to the No-Action Alternative.

**Agnew Lake**: As originally designed, Agnew Dam impounded Agnew Lake, a 40-acre reservoir with a storage capacity of 810 acre-feet. Since 2013, under the FERC-mandated storage restrictions, only a small natural lake (23 acres; 569 acre-feet), that pre-dates the Project, exists upstream of the dam. In 2017, two rectangular notches were cut in Agnew to allow the reservoir to pass high flows downstream to facilitate compliance with the FERC-mandated reservoir elevation restrictions. Under existing conditions, Agnew Lake no longer stores water or diverts water for power generation. Water entering the lake passes through the two notches in the bottom of the dam and flows into Rush Creek.

Under the Proposed Action, SCE would remove Agnew Dam (dam abutments would remain). Because Agnew Dam does not currently impound water, Project facility modifications implemented under the Proposed Action would not result in any changes to the pre-project natural lake that exists under current conditions. Although removal of Agnew Dam would not change water surface elevations within the pre-project natural lake, removal of the dam itself and restoration of the perimeter of the natural lake would result in an overall benefit to the visual quality and character as compared to the No-Action Alternative.

**Associated Facilities:** Several ancillary support facilities would be removed as part of the Proposed Action. All ancillary facilities near Rush Meadows Dam would be removed except the United States Geological Survey stream gage located downstream of the dam. Near Agnew Dam, ancillary facilities, including the Agnew Dam to Agnew Junction Flowline, Agnew Dam Valve House, Reservoir Gage, 4-kilovolt Tap Line, Boat Dock Tap Line, and the Weather Station would be removed. Refer to Section 5 for a complete list of ancillary support facilities to be removed.

Removal of Project facilities would restore the visual integrity to the areas around Agnew Lake and Waugh Lake. The Waugh Lake area would be restored to a landscape with only remanent developed infrastructure. The landscape character around Agnew Dam would undergo a less visually dramatic change as the lake and much of the existing ancillary infrastructure would remain. In both areas, removal of the Project facilities would result in an overall benefit to the visual quality and character as compared to the No-Action Alternative.

#### 9.2.10.4 Construction Measures

To avoid or reduce impacts to visual resources during construction, SCE will implement the following measures. A complete list of construction measures is included in Section 5, Appendix 5-B.

- Limit construction activities to designated work and staging areas
- Limit work time and duration
- Select equipment that is less visually intrusive
- Conduct public outreach and communication
- Comply with measures that limit fugitive dust that could otherwise reduce scenic visibility and obscure views

#### 9.2.10.5 Unavoidable Adverse Effects

Project facility modifications would have a temporary unavoidable adverse effect on aesthetic resources, particularly in backcountry areas.

#### 9.2.10.6 References

SCE (Southern California Edison Company). 2024. Draft LAND 1 – Aesthetic Resources Technical Study Report. August. Available in Supporting Document A of the Application for New License.

## TABLE OF CONTENTS

Page

9.2.11 Cultural Resources – Construction Effects ............ 9.2.11-1
- 9.2.11.1 Potential Adverse Effects to Historic Properties ............ 9.2.11-1
- 9.2.11.2 Potential Effects to Cultural Resources from Project Facility Modifications ............ 9.2.11-2
- 9.2.11.3 Changes to Existing FERC Project Boundary ............ 9.2.11-5
- 9.2.11.4 Construction Measures ............ 9.2.11-5
- 9.2.11.5 References ............ 9.2.11-6

## LIST OF ACRONYMS

| | |
|---|---|
| CFR | Code of Federal Regulations |
| FERC | Federal Energy Regulatory Commission |
| Forest Service | United States Forest Service |
| HPM | Heritage Program Manager (Forest Service) |
| MOA | Memorandum of Agreement |
| NRHP | National Register of Historic Places |
| Project | Rush Creek Project |
| RCHSHD | Rush Creek Hydroelectric System Historic District |
| RMAD | Rush Meadows Archaeological District |
| SCE | Southern California Edison Company |
| Tribes | American Indian Tribes |
| TSR | Technical Study Report |

### 9.2.11 Cultural Resources – Construction Effects

This section describes the potential construction-related effects to cultural resources (archaeological and built environment resources) that could occur because of Project facility modifications to be implemented under the Proposed Action for Southern California Edison Company's (SCE) Rush Creek Project (Project). A description of Project facility modifications, including restoration activities, to be implemented under the Proposed Action is included in Section 5 and Appendix 5-A.

Potential effects are determined by analyzing the changes to cultural resources that may result from activities to be implemented under the Proposed Action compared to the No-Action Alternative (existing condition) (Section 4). This effects analysis considers construction measures included to avoid or mitigate impacts associated with construction activities (refer to Section 5, Appendix 5-B). Unavoidable adverse effects are discussed at the end of this section.

This section provides an initial effects analysis for each of the proposed Project facility modifications. As discussed in Section 8.12, Cultural Resources Affected Environment, the Draft CUL 1 – Built Environment Technical Study Report (TSR) (Riggs, Boswell, and Walton 2024) and Draft CUL 2 – Archaeology TSR (Canoff et al. 2024) are being reviewed by SCE, the United States Forest Service (Forest Service) and other stakeholders. The Final License Application will contain more complete information on TSRs and the final effects determination. Federal Energy Regulatory Commission (FERC) as the lead agency makes the final effects determination in consultation with the Forest Service. The State Historic Preservation Officer concurs on the effects determination.

The following potential effects to cultural resources associated with Project facility modifications were evaluated:

- Potential effects to cultural resources from Project facility modifications.
- Potential effects to cultural resources from reduction in the FERC Project boundary following Project facility modifications.

#### 9.2.11.1 Potential Adverse Effects to Historic Properties

An adverse effect is defined in the regulations implementing section 106 of the National Historic Preservation Act of 1966 (Section 106) at 36 Code of Federal Regulations (CFR) Part 800.5(a)(1). Pursuant to that definition, an adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register of Historic Places (NRHP) in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. A resource that has not yet been evaluated for the NRHP is assumed eligible for listing and treated as historic property until determined otherwise.

Section 106 requires that every federal agency "take into account" how each of its undertakings could affect historic properties. Historic properties are districts, sites, buildings, structures, traditional cultural properties, and objects significant in American history, architecture, engineering, and culture that are eligible for inclusion in the NRHP. If an undertaking will or may adversely affect historic properties, the federal agency must consult with the State and/or Tribal Historic Preservation Officer and other parties to negotiate and execute a Section 106 agreement document (typically a Memorandum of Agreement [MOA] or Programmatic Agreement) that sets out the measures the federal agency will implement to resolve those adverse effects through avoidance, minimization, or mitigation.

#### 9.2.11.2 Potential Effects to Cultural Resources from Project Facility Modifications

Project facility modifications have the potential to affect archaeological sites eligible for listing on the NRHP, contributing to the NRHP eligible Rush Meadows Archaeological District (RMAD), or unevaluated sites through direct and indirect effects. Project facility modifications will affect built environment resources through modification or removal of character defining features of contributing elements of the NRHP eligible Rush Creek Hydroelectric System Historic District (RCHSHD). Potential indirect effects include alteration of RCHSHD operational and visual setting.

**Rush Meadows Dam Removal**

Since 2012, as required by the FERC, Waugh Lake has been limited to a maximum water surface elevation of 9,392.1 feet to meet seismic restrictions and alleviate safety concerns. The spillway was notched in 2018 to help facilitate compliance with the FERC-mandated reservoir elevation restrictions. Currently, Waugh Lake is not operated for storage, rather the low-level outlets on Rush Meadows Dam are left open so that inflow passes through the reservoir. During spring high flows, temporary storage occurs in the lake when the inflows exceed the capacity of the low-level outlets and the notched spillway.

Under the Proposed Action, SCE would remove Rush Meadows Dam such that it no longer impounds water (dam abutments would remain) and restore the former lakebed. Partial removal of Rush Meadows Dam and the associated restoration activities have the potential to directly affect archaeological resources through ground disturbance from construction activities, staging areas, helicopter landing zones, construction camps, and mule access and holding areas. Construction of a notch in the center of Rush Meadows Dam to eliminate the water impoundment may cause indirect effects by exposing previously inundated precontact archaeological resources and the RMAD within Waugh Lake (formerly Rush Meadows) to erosional processes and looting.

The Rush Meadows Dam is a contributing element of the RCHSHD. The proposed modifications to the dam and removal of associated facilities will constitute an adverse effect because the dam will be substantially modified and no longer function as a dam in the hydro system. This plus the removal of Agnew Dam (discussed in the next section) may have an adverse effect on the RCHSHD by modifying how the system functions as whole.

Potential adverse effects to archaeological resources from Project facility modifications may be avoided through implementation of construction measures such as but not limited to flag and avoid resources, monitoring and an inadvertent discovery plan. Adverse effects to cultural resources that cannot be avoided will follow the Section 106 process pursuant to 36 CFR Part 800.5 assessment of adverse effects and 800.6 resolution of adverse effects through a MOA, which will include mitigation and monitoring plan, or equivalent (see Appendix 5-B for details).

As a result of removal of Rush Meadows Dam, Waugh Lake would be restored (upland, wetland, riparian communities) and the Rush Creek channel would be reestablished within the lakebed. Natural flows would also be reestablished in Rush Creek within the former lakebed and downstream of the former dam site. Following construction and restoration, the dam site and former lakebed would be returned to natural conditions. Proposed restoration activities have the potential to adversely affect archaeological resources and the RMAD through ground disturbance associated with stabilization measures, erosion features, restoration activities, revegetation, and reestablishment of original creek channels. If restoration plans are designed in collaboration with cultural resources specialists, the Forest Service Heritage Program Manager (HPM), and American Indian Tribes (Tribes), these plans could avoid potential adverse effects and have beneficial effects to archaeological resources by preventing on-site erosion and other indirect effects.

**Agnew Dam Removal**

As originally designed, Agnew Dam impounded Agnew Lake, a 40-acre reservoir with a storage capacity of 810 acre-feet. Since 2013, under the FERC-mandated storage restrictions, only a small natural lake (23 acres; 569 acre-feet), that pre-dates the Project, exists upstream of the dam. In 2017, two rectangular notches were cut in Agnew to allow the reservoir to pass high flows downstream to facilitate compliance with the FERC-mandated reservoir elevation restrictions. Under existing conditions, Agnew Lake no longer stores water or diverts water for power generation. Water entering the lake passes through the two notches in the bottom of the dam and flows into Rush Creek.

Under the Proposed Action, SCE would remove Agnew Dam (dam abutments would remain) and restore the former lakebed. Partial removal of Agnew Dam and the associated restoration activities have the potential to directly affect archaeological resources through ground disturbance from construction activities, staging areas, helicopter landing zones, construction camps, and mule access and holding areas.

Agnew Dam is a contributing element of the RCHSHD. The proposed modifications to the dam and removal of associated facilities will constitute an adverse effect because the character defining features of dam will be substantially modified and the dam will no longer function as part of the hydroelectric system. This plus the removal of Rush Meadows Dam (discussed in previous section) may have an adverse effect on the RCHSHD by modifying how the system functions as whole.

Potential adverse effects to archaeological resources from Project facility modifications may be avoided through implementation of construction measures such as but not limited to flag and avoid resources, monitoring and an inadvertent discovery plan. Adverse effects to cultural resources that cannot be avoided will follow the Section 106 process pursuant to 36 CFR Part 800.5 assessment of adverse effects and 800.6 resolution of adverse effects through a MOA, which will include mitigation and monitoring plan, or equivalent (see Appendix 5-B for details).

Because Agnew Dam does not currently impound water, Project facility modifications implemented under the Proposed Action would not result in any changes to the pre-project natural lake that exists under current conditions. Restoration activities have the potential to adversely affect archaeological resources through ground disturbance associated with stabilization measures, erosion features, restoration activities, revegetation, and reestablishment of original creek channels. If restoration plans are designed in collaboration with cultural resources specialists, the Forest Service HPM, and Tribes, these plans could avoid potential adverse effects and have beneficial effects to archaeological resources by preventing on-site erosion and other indirect effects.

**Gem Dam Retrofit**

Under the Proposed Action, Gem Dam would be retrofitted to facilitate compliance with the seismic restrictions under a probable maximum flood event with a new spillway and reduced dam height. After retrofitting, Gem Dam would not extend as far above the surface water elevation of the lake, though the maximum allowable water surface elevation of the lake, 9,027.5 feet, would remain unchanged. As part of the Project facility modifications, the former inundation zone of Gem Dam, prior to the 2012 seismic restrictions, would be revegetated and stabilized, as necessary.

Retrofitting of Gem Dam and the associated restoration activities have the potential to directly affect archaeological resources through ground disturbance from construction activities, staging areas, helicopter landing zones, construction camps, and mule access and holding areas. Reduction of the reservoir elevation through the proposed retrofits to the dam may cause indirect effects by exposing previously inundated precontact archaeological resources within and surrounding Gem Lake to erosional processes, new areas of wave action and looting.

Gem Dam is a contributing element of the RCHSHD. The reinforced concrete multiple-arch structural design and the unique design of the spillway are character defining features of the dam. Proposed modifications to these features will likely constitute an adverse effect through diminishing the historic character of the structure. The proposed retrofit will not affect the operation of the Gem Dam within the RCHSHD but modifications to the spillway and arches may adversely affect the overall visual characteristics and historic settling the RCHSHD.

Potential adverse effects to archaeological resources from Project facility modifications may be avoided through implementation of construction measures such as but not limited to flag and avoid resources, monitoring and an inadvertent discovery plan. Adverse effects to cultural resources that cannot be avoided will follow the Section 106 process pursuant to 36 CFR Part 800.5 assessment of adverse effects and 800.6 resolution of adverse effects through a MOA, which will include mitigation and monitoring plan, or equivalent (see Appendix 5-B for details).

Although retrofitting of Gem Dam would not change maximum water surface elevations within Gem Lake, restoration of the former inundation zone has the potential to adversely affect archaeological resources located in this zone. If restoration plans are designed in collaboration with cultural resources specialists, the Forest Service HPM, and Tribes, these plans could avoid potential adverse effects and have beneficial effects to archaeological resources by preventing on-site erosion and other indirect effects.

#### 9.2.11.3 Changes to Existing FERC Project Boundary

Following implementation of Project facility modifications, SCE would file revised Exhibit G maps to formally remove lands from the FERC Project boundary that will no longer be necessary for operation and maintenance of the Project (refer to Exhibit G). Project facility modifications would occur on land under the jurisdiction of the Forest Service. Once FERC approves the revised Exhibit G maps, the Project boundary change would become effective, and the Forest Service would assume full managerial responsibility for the areas formerly within the FERC Project boundary around Agnew Lake and Waugh Lake. There would be a small reduction to the FERC Project boundary around Gem Lake as a result of the lower maximum reservoir water surface elevation.

Since the Forest Service would assume full managerial responsibility for the areas removed from the FERC Project boundary and would adequately manage historic properties under Section 106 if the NHPA and Forest Service land management policies, there would be no effect to archaeological and built environment resources as a result of FERC Project boundary modifications.

#### 9.2.11.4 Construction Measures

To avoid or reduce impacts to archaeological and built environment resources during construction, SCE will implement cultural and Tribal resource measures included in Section 5, Appendix 5-B.

### 9.2.11.5 References

Canoff, Alyssa, Kaitlin Harstine, Mark Sutton, and Emily Holt. 2024. CUL 2 – Archaeological Resources Technical Study Report for the Rush Creek Project (FERC Project No. 1389). To be provided in the Final License Application.

Riggs, Becca, Lauren Walton, and Sharon Boswell. 2024. CUL 1 – Built Environment Technical Study Report for the Rush Creek Project (FERC Project No. 1389). To be provide in the Final License Application.

## TABLE OF CONTENTS

Page

9.2.12 Tribal Resources – Construction Effects ..... 9.2.12-2
9.2.12.1 Potential Adverse Effects to Historic Properties ..... 9.2.12-2
9.2.12.2 Potential Effects to Tribal Resources from Project Facility Modifications ..... 9.2.12-3
9.2.12.3 Changes to the Existing FERC Project Boundary ..... 9.2.12-5
9.2.12.4 Construction Measures ..... 9.2.12-6
9.2.12.5 References ..... 9.2.12-6

## LIST OF ACRONYMS

| | |
|---|---|
| CFR | Code of Federal Regulations |
| FERC | Federal Energy Regulatory Commission |
| Forest Service | United States Forest Service |
| HPM | Heritage Program Manager (Forest Service) |
| MOA | Memorandum of Agreement |
| NRHP | National Register of Historic Places |
| Project | Rush Creek Project |
| SCE | Southern California Edison Company |
| TEK | Traditional Ecological Knowledge |
| Tribes | American Indian Tribes |
| TSR | Technical Study Report |

### 9.2.12 Tribal Resources – Construction Effects

This section describes the potential construction-related effects to Tribal resources that could occur because of Project facility modifications to be implemented under the Proposed Action for Southern California Edison Company's (SCE) Rush Creek Project (Project). A description of Project facility modifications, including restoration activities, to be implemented under the Proposed Action is included in Section 5 and Appendix 5-A.

Potential effects are determined by analyzing the changes to Tribal resources that may result from activities to be implemented under the Proposed Action compared to the No-Action Alternative (existing condition) (Section 4). This effects analysis considers construction measures included to avoid or mitigate impacts associated with construction activities (refer to Section 5, Appendix 5-B). Unavoidable adverse effects are discussed at the end of this section.

This section provides an initial effects analysis for each of the proposed Project facility modifications. As discussed in Section 8.13, Tribal Resources Affected Environment, the Draft TRI 1 – Tribal Resources Technical Study Report (TSR) (West and Lerch 2024) is being reviewed by SCE, the United States Forest Service (Forest Service) and other stakeholders. The Final License Application will contain more complete information on TSRs and the final effects determination. The Federal Energy Regulatory Commission (FERC) as the lead agency makes the final effects determination in consultation with the Forest Service. The State Historic Preservation Officer concurs on the effects determination.

The following potential effects to Tribal resources associated with Project facility modifications were evaluated:

- Potential effects to Tribal resources from Project facility modifications.
- Potential effects to Tribal resources from reduction in the FERC Project boundary following Project facility modifications.

#### 9.2.12.1 Potential Adverse Effects to Historic Properties

An adverse effect is defined in the regulations implementing section 106 of the National Historic Preservation Act of 1966 (Section 106) at 36 Code of Federal Regulations (CFR) Part 800.5(a)(1). Pursuant to that definition, an adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register of Historic Places (NRHP) in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. A resource that has not yet been evaluated for the NRHP is assumed eligible for listing and treated as historic property until determined otherwise.

Section 106 requires that every federal agency "take into account" how each of its undertakings could affect historic properties. Historic properties are districts, sites, buildings, structures, traditional cultural properties, and objects significant in American history, architecture, engineering, and culture that are eligible for inclusion in the NRHP. If an undertaking will or may adversely affect historic properties, the federal agency must consult with the State and/or Tribal Historic Preservation Officer and other parties to negotiate and execute a Section 106 agreement document (typically a Memorandum of Agreement [MOA] or Programmatic Agreement) that sets out the measures the federal agency will implement to resolve those adverse effects through avoidance, minimization, or mitigation.

#### 9.2.12.2 Potential Effects to Tribal Resources from Project Facility Modifications

**Rush Meadows Dam Removal**

Since 2012, as required by FERC, Waugh Lake has been limited to a maximum water surface elevation of 9,392.1 feet to meet seismic restrictions and alleviate safety concerns. The spillway was notched in 2018 to help facilitate compliance with the FERC-mandated reservoir elevation restrictions. Currently, Waugh Lake is not operated for storage, rather the low-level outlets on Rush Meadows Dam are left open so that inflow passes through the reservoir. During spring high flows, temporary storage occurs in the lake when the inflows exceed the capacity of the low-level outlets and the notched spillway.

Under the Proposed Action, SCE would remove Rush Meadows Dam such that it no longer impounds water (dam abutments would remain) and restore the former lakebed. Partial removal of Rush Meadows Dam and the associated restoration activities have the potential to directly affect Tribal resources through ground disturbance from construction activities, staging areas, helicopter landing zones, construction camps, and mule access and holding areas. Construction of a notch in the center of Rush Meadows Dam to eliminate the water impoundment may cause indirect effects by exposing previously inundated precontact archaeological resources within Waugh Lake (formerly Rush Meadows) to erosional processes and looting. Leaving portions of the dam in place rather than full restoration may have potential visual and aesthetic effects to Tribal resources.

Potential adverse effects to Tribal resources from Project facility modifications may be avoided through implementation of construction measures such as but not limited to flagging and avoiding resources, monitoring and development/implementation of an inadvertent discovery plan. Adverse effects to Tribal resources that cannot be avoided will follow the Section 106 process pursuant to 36 CFR Part 800.5 assessment of adverse effects and 800.6 resolution of adverse effects through a MOA, which will include mitigation and monitoring plan, or equivalent (see Appendix 5-B for details).

As a result of removal of Rush Meadows Dam, Waugh Lake would be restored (upland, wetland, riparian communities) and the Rush Creek channel would be reestablished within the lakebed. Natural flows would also be reestablished in Rush Creek within the former lakebed and downstream of the former dam site. Following construction and restoration, the dam site and former lakebed would be returned to natural conditions. Proposed restoration activities have the potential to adversely affect precontact archaeological resources through ground disturbance associated with stabilization measures, erosion features, restoration activities, revegetation, and reestablishment of original creek channels. If restoration plans are designed in collaboration with American Indian Tribes (Tribes), cultural resources specialists, and the Forest Service Heritage Program Manager (HPM), these plans could avoid potential adverse effects and have beneficial effects to Tribal resources by preventing on-site erosion and other indirect effects. Additionally, Traditional Ecological Knowledge (TEK) may be incorporated into the restoration plan to benefit Tribal resources and other resources.

**Agnew Dam Removal**

As originally designed, Agnew Dam impounded Agnew Lake, a 40-acre reservoir with a storage capacity of 810 acre-feet. Since 2013, under the FERC-mandated storage restrictions, only a small natural lake (23 acres; 569 acre-feet), that pre-dates the Project, exists upstream of the dam. In 2017, two rectangular notches were cut in Agnew to allow the reservoir to pass high flows downstream to facilitate compliance with the FERC-mandated reservoir elevation restrictions. Under existing conditions, Agnew Lake no longer stores water or diverts water for power generation. Water entering the lake passes through the two notches in the bottom of the dam and flows into Rush Creek.

Under the Proposed Action, SCE would remove Agnew Dam (dam abutments would remain) and restore the former lakebed. Partial removal of Agnew Dam and the associated restoration activities have the potential to directly affect Tribal resources through ground disturbance from construction activities, staging areas, helicopter landing zones, construction camps, and mule access and holding areas. Because Agnew Dam does not currently impound water, Project facility modifications implemented under the Proposed Action would not result in any changes to the pre-project natural lake that exists under current conditions.

Potential adverse effects to Tribal resources from Project facility modifications may be avoided through implementation of construction measures such as but not limited to flagging and avoiding resources, monitoring and development/implementation of an inadvertent discovery plan. Adverse effects to Tribal resources that cannot be avoided will follow the Section 106 process pursuant to 36 CFR Part 800.5 assessment of adverse effects and 800.6 resolution of adverse effects through a MOA, which will include mitigation and monitoring plan, or equivalent (see Appendix 5-B for details).

Although removal of Agnew Dam would not change water surface elevations within the pre-project natural lake, removal of the dam itself and restoration of the perimeter of the natural lake would result in an overall benefit to Tribal resources as compared to the No-Action Alternative. If restoration plans are designed in collaboration with Tribes, cultural resources specialists, and the Forest Service HPM, these plans could avoid potential adverse effects and have beneficial effects to Tribal resources by preventing on-site erosion and other indirect effects. Additionally, TEK may be incorporated into the restoration plan to benefit Tribal resources and other resources.

## Gem Dam Retrofit

Under the Proposed Action, Gem Dam would be retrofitted to facilitate compliance with the seismic restrictions under a probable maximum flood event with a new spillway and reduced dam height. After retrofitting, Gem Dam would not extend as far above the surface water elevation of the lake, though the maximum allowable water surface elevation of the lake, 9,027.5 feet, would remain unchanged. As part of the Project facility modifications, the former inundation zone of Gem Dam, prior to the 2012 seismic restrictions, would be revegetated and stabilized, as necessary.

Retrofitting of Gem Dam and the associated restoration activities have the potential to directly affect Tribal resources through ground disturbance from construction activities, staging areas, helicopter landing zones, construction camps, and mule access and holding areas. Reduction of the reservoir elevation through the proposed retrofits to the dam may cause indirect effects by exposing previously inundated precontact archaeological resources within and surrounding Gem Lake to erosional processes, new areas of wave action and looting.

Potential adverse effects to Tribal resources from Project facility modifications may be avoided through implementation of construction measures such as but not limited to flagging and avoiding resources, monitoring and development/implementation of an inadvertent discovery plan. Adverse effects to Tribal resources that cannot be avoided will follow the Section 106 process pursuant to 36 CFR Part 800.5 assessment of adverse effects and 800.6 resolution of adverse effects through a MOA, which will include mitigation and monitoring plan, or equivalent (see Appendix 5-B for details).

Although retrofitting of Gem Dam would not change maximum water surface elevations within Gem Lake, restoration of the former inundation zone would result in an overall benefit to Tribal resources as compared to the No-Action Alternative. If restoration plans are designed in collaboration with Tribes, cultural resources specialists, and the Forest Service HPM, these plans could avoid potential adverse effects and have beneficial effects to Tribal resources by preventing on-site erosion and other indirect effects. Additionally, TEK may be incorporated into the restoration plan to benefit Tribal resources and other resources.

### 9.2.12.3 Changes to the Existing FERC Project Boundary

Following implementation of Project facility modifications, SCE would file revised Exhibit G maps to formally remove lands from the FERC Project boundary that will no longer be necessary for operation and maintenance of the Project (refer to Exhibit G). Project facility modifications would occur on land under the jurisdiction of the Forest Service. Once FERC approves the revised Exhibit G maps, the Project boundary change would become effective, and the Forest Service would assume full managerial responsibility for the areas formerly within the FERC Project boundary around Agnew Lake and Waugh Lake. There would be a small reduction to the FERC Project boundary around Gem Lake as a result of the lower maximum reservoir water surface elevation.

Since the Forest Service would assume full managerial responsibility for the areas removed from the FERC Project boundary and would adequately manage historic properties under Section 106 if the NHPA and Forest Service land management policies, there would be no effect to Tribal resources as a result of FERC Project boundary modifications.

#### 9.2.12.4 Construction Measures

To avoid or reduce impacts to Tribal resources during construction, SCE will implement the cultural and Tribal resource measures included in Section 5, Appendix 5-B.

#### 9.2.12.5 References

West, Crystal and Michael Lerch. 2024. TRI 1 – Tribal Resources Technical Study Report. August. To be provided in the Final License Application.

## TABLE OF CONTENTS

Page

9.2.13 Socioeconomics – Construction Effects ... 9.2.13-1
9.2.13.1 Potential Impacts to Socioeconomics Due to an Increase in Temporary Workers and Need for Housing During Construction ... 9.2.13-1
9.2.13.2 Potential Impacts to Socioeconomics Due to an Increase in Demand for Public Services During Construction ... 9.2.13-2
9.2.13.3 Changes to the Local and Regional Economy as a Result of a Temporary Workforce During Construction ... 9.2.13-2
9.2.13.4 Changes to the Local and Regional Economy as a Result of a Reduced Tourism During Construction ... 9.2.13-3
9.2.13.5 Potential Impacts to Low-Income or Minority Populations During Construction ... 9.2.13-4
9.2.13.6 Construction Measures ... 9.2.13-5
9.2.13.7 Unavoidable Adverse Effects ... 9.2.13-5
9.2.13.8 References ... 9.2.13-5

## LIST OF ACRONYMS

| | |
|---|---|
| CEQ | Council on Environmental Quality |
| EAP | Emergency Action Plan |
| EPA | United States Environmental Protection Agency |
| FERC | Federal Energy Regulatory Commission |
| Project | Rush Creek Project |
| PSP | Public Safety Plan |
| SCE | Southern California Edison |
| SR-158 | State Route 158 |

### 9.2.13 Socioeconomics – Construction Effects

This section describes the potential construction-related effects to socioeconomics that could occur because of Project facility modifications to be implemented under the Proposed Action for Southern California Edison Company's (SCE) Rush Creek Project (Project). A description of Project facility modifications, including restoration activities, to be implemented under the Proposed Action is included in Section 5 and Appendix 5-A.

Potential effects are determined by analyzing the changes in socioeconomics that may result from activities to be implemented under the Proposed Action compared to the No-Action Alternative (existing condition) (Section 4). Final effects determinations consider construction measures included to avoid or mitigate impacts associated with constructions activities (refer to Section 5, Appendix 5-B). Unavoidable adverse effects are discussed at the end of this section.

The following potential effects to socioeconomics associated with Project facility modifications were evaluated:

- Increase in temporary workers and need for housing
- Increase in demand for public services, including law enforcement and public safety, fire protection, and emergency services/response
- Potential changes to the local and regional economy as a result of a temporary workforce during construction
- Potential changes to the local and regional economy as a result of reduced tourism during construction
- Effects on low-income or minority populations (environmental justice)

#### 9.2.13.1 Potential Impacts to Socioeconomics Due to an Increase in Temporary Workers and Need for Housing During Construction

The anticipated duration of construction for partial removal of Rush Meadows Dam and of Agnew Dam is one construction season each (June 1 to October 31). The anticipated duration of construction for the retrofit of Gem Dam is three seasons. Worker housing for activities at Rush Meadows and Gem dams would be provided onsite. Agnew Dam has limited onsite worker housing, however, given the closer proximity of Agnew Dam to the town of June Lake, primary worker housing would be located at hotels in the vicinity of the Project. Onsite camps for workers would provide kitchen facilities, and shower and restroom facilities.

During each construction season, there would be a maximum of an additional 18 seasonal workers at a construction site on each scheduled workday (Rush Meadows and Agnew, 8 to 12 workers; Gem Dam 12 to 18 workers). Because most of these workers would be provided with temporary onsite housing in the backcountry, their seasonal presence would not substantially increase population growth, displace any number of existing people from currently available housing, or require the construction of permanent housing in the area.

There are no anticipated socioeconomic effects related to housing or housing availability associated with Project facility modifications.

#### 9.2.13.2 Potential Impacts to Socioeconomics Due to an Increase in Demand for Public Services During Construction

Project facility modifications include heavy construction activities that could, without appropriate safety measures, result in safety emergencies, including fire starts and worker/public injury. These safety emergencies could result in an increase in demand for public services during construction activities.

For the overall Rush Creek Project, SCE maintains a Public Safety Plan (PSP) that identifies the location of public safety measures and signage at Project facilities. The goal of the PSP is to reduce the potential for any accidents near or within locations where SCE facilities are present. In addition, SCE maintains an Emergency Action Plan (EAP) for Agnew Dam, Gem Dam and Rush Meadows Dam, and operates the dams in accordance with each individual EAP.

Prior to construction, the contractor would be required to prepare a site-specific safety plan for each construction area and the June Mountain Ski Area Parking Lot (Base of Operations), including measures for worker and public safety. Each safety plan would detail the scope of work, identify risks, and detail policies and safety practices to follow. During site orientation, workers would learn about the scope of work to be performed, potential safety hazards, and protocols to avoid injuries and accidents. In addition, the contractor would be required to prepare a site-specific fire prevention and suppression plan that provides safe procedures, environmental protection measures, and other specific stipulations and methods to prevent and respond to fires during construction activities.

With continued implementation of SCE’s PSP and EAP, and development and implementation of site-specific safety plans and fire prevention and suppression plans, demand for public services including, law enforcement and public safety; fire protection; and emergency services/response would not measurably increase as a result of implementation of Project facility modifications; therefore, impacts to socioeconomics are considered negligible.

#### 9.2.13.3 Changes to the Local and Regional Economy as a Result of a Temporary Workforce During Construction

The addition of a temporary workforce is not expected to measurably affect the local and regional economy, even providing for the housing of a small number of the workforce in local hotels. Most of the workers would be housed, and kitchen facilities provided onsite and in the backcountry. The projected utilization of local hotels would result in collection of a Transient Occupancy Tax in addition to temporary long-term rental security for hotel operators.

The implementation of Project facility modifications would result in the addition of a maximum of 18 workers at a construction site on each scheduled workday. Most of these workers would be provided with temporary on-site housing in the backcountry and therefore their seasonal presence is not expected to substantially increase population growth, displace any number of existing people from currently available employment, opportunities, or have a marked effect on local revenue.

There are no anticipated socioeconomic effects related to the economy or employment opportunities as a result of the temporary workforce associated with Project facility modification construction activities.

### 9.2.13.4 Changes to the Local and Regional Economy as a Result of a Reduced Tourism During Construction

The local and regional economy of the town of June Lake and surrounding area is largely dependent on recreation tourism. Approximately 38.5 percent of all employment in Mono County is directly associated with travel and recreation (Center for Economic Development 2018). In service to this industry, there are approximately 20 day-use and overnight developed recreation facilities accessible from State Route 158 (SR-158)/the June Lake Loop, including 12 campgrounds/recreational vehicle parks and at least one marina and boat launch at each of the four lakes accessible from the highway: June Lake, Gull Lake, Silver Lake and Grant Lake. There are also multiple overnight lodging facilities (hotels and motels). In addition to the recreation opportunities available and accessible from SR-158, the June Lake Loop provides multiple access points to backcountry activities including hiking, fishing, and backpacking in the Inyo National Forest and nearby wilderness areas (Ansel Adams Wilderness and Owens River Headwaters Wilderness). There are 13 formal Forest Service Trails in the vicinity that provide access to the backcountry. Refer to Section 8.10, Table 8.10-2 for a list of developed recreation facilities (including formal trails) in the vicinity of the Rush Creek Project.

The active construction areas (dam construction sites) associated with the Project are in the backcountry, not accessible by road, and distant from the June Lake Loop. However, the Base of Operations for these backcountry construction areas is identified as the June Mountain Ski Area Parking Lot, located approximately four miles from the south junction of United States Route 395 and SR-158 (north of the town of June Lake) and accessible via a driveway from SR-158. The Base of Operations would be established at the beginning of each construction season and would include project management facilities; a helicopter landing site; supporting construction equipment; a staging area; a stockpile area; a designated general parking area; sanitary facilities; and security. The Base of Operations would function as the transportation hub for construction activities, including (1) arrival and departure of personnel to the job site; (2) receiving center for arrival and departure of construction equipment and material from the contractors and supply companies; (3) transport of equipment and material to/from the dam construction areas; and (4) receipt and loading of debris/material removed from the dam construction areas for transport to an approved disposal site. The Base of Operations would not require exclusive use of the parking lot; the parking lot would continue to be available for use by June Mountain Ski Area employees and guests for special events (such as mid-mountain weddings).

Construction-related activities that could affect tourism during construction (and thus impact the local and regional economy) include:

- Construction traffic to and from the Base of Operations;
- Exposure to construction noise including from truck haul trips to and from the Base of Operations along SR-158, construction equipment at the Base of Operations, and helicopters travelling between the Base of Operations and backcountry construction areas; and
- Access restrictions to popular backcountry areas.

The effects of Project facility modifications on recreation, noise, and traffic are discussed in Section 9.2.9, Section 9.2.15, and Section 9.2.16, respectively. During Project facility modifications (a cumulative total of five construction seasons; June 1 through October 31), increased construction truck traffic along SR-158; elevated noise levels from truck traffic, operation of construction equipment and helicopter use at the Base of Operations; and access restrictions to popular backcountry areas could reduce the desirability of the June Lake Loop area as a recreation destination. Exposure to construction activities could diminish the quality of recreational experiences and discourage visitation or return visits; and restricted access to backcountry areas may affect whether some visitors choose the June Lake Loop as their travel destination while Project facility modifications are ongoing. The result could be a temporary decline in tourism that has the potential to affect the local and regional economy. Following implementation of measures to reduce potential recreation, noise and traffic effects (9.2.9, Recreation; 9.2.15, Noise; 9.2.16, Traffic), effects would still be considered temporary and adverse.

#### 9.2.13.5 Potential Impacts to Low-Income or Minority Populations during Construction

The Federal Energy Regulatory Commission (FERC) follows Executive Order 12898, which directs federal agencies to identify and address “disproportionately high and adverse human health or environmental effects” of their actions on minority and low-income populations (i.e., environmental justice communities). Consistent with the Council on Environmental Quality's (CEQ) and the U.S. Environmental Protection Agency’s (EPA) environmental justice guidance and recommendations, FERC’s methodology for assessing environmental justice impacts considers: (1) whether environmental justice communities (e.g., minority or low-income populations) exist in the project area; (2) whether impacts on environmental justice communities are disproportionately high and adverse; and (3) possible mitigation measures. *See* CEQ, *Environmental Justice Guidance Under the National Environmental Policy Act* (Dec. 1997); EPA, Promising Practices for EJ Methodologies in NEPA Reviews (Mar. 2016). As recommended in Promising Practices, FERC uses the 50 percent and the meaningfully greater analysis methods to identify minority populations. Using this methodology, minority populations have been defined as where either: (1) the aggregate minority population of the block groups in the affected area exceeds 50 percent; or (2) the aggregate minority population in the block group affected is 10 percent higher than the aggregate minority population percentage in the county.

CEQ guidance also recommends that low-income populations be identified based on the annual statistical poverty thresholds from the U.S. Census Bureau. Using the EPA guidance's low-income threshold criteria method, low-income populations are identified as block groups where the percent of low-income population in the identified block group is equal to or greater than that of the county.

As discussed in the Draft EJ 1 – Environmental Justice Technical Study Report (SCE 2024) the June Lake Census Designated Place is not an Environmental Justice community; therefore, Project facility modifications would have no effect on low-income or minority populations.

#### 9.2.13.6 Construction Measures

Measures applicable to avoiding or reducing impacts to socioeconomics in the vicinity of Project facility modifications include those pertaining to recreation, noise and traffic. Refer to the effects section for each of those resource areas (9.2.9, Recreation; 9.2.15, Noise; 9.2.16, Traffic) for more information on specific measures. A complete list of construction measures is included in Section 5, Appendix 5-B.

#### 9.2.13.7 Unavoidable Adverse Effects

Project facility modifications would have a temporary unavoidable adverse effect on socioeconomic resources.

#### 9.2.13.8 References

Center for Economic Development. 2018. Mono County Economic and Demographic Profile. Available at: https://www.monocounty.ca.gov/sites/default/files/fileattachments/economic_development/page/767/2018_mono_economic_demographic_profile.pdf

SCE (Southern California Edison). 2024. Draft EJ 1 – Environmental Justice Technical Study Report. August. Available in Supporting Document A of the Application for New License.

## TABLE OF CONTENTS

Page

9.2.14 Air Quality – Construction Effects .......... 9.2.14-1
9.2.14.1 Approach to Analysis .......... 9.2.14-1
9.2.14.2 Modeling Assumptions .......... 9.2.14-3
9.2.14.3 Emissions Estimate Methodology .......... 9.2.14-3
9.2.14.4 Criteria Pollutant and Fugitive Dust Emissions .......... 9.2.14-5
9.2.14.5 Potential Health Effects and Environmental Justice .......... 9.2.14-6
9.2.14.6 Greenhouse Gas Emissions .......... 9.2.14-7
9.2.14.7 Construction Measures .......... 9.2.14-8
9.2.14.8 Unavoidable Adverse Effects .......... 9.2.14-8
9.2.14.9 References .......... 9.2.14-8

## LIST OF TABLES

Table 9.2.14-1. Thresholds of Significance for Criteria Pollutants .......... 9.2.14-11
Table 9.2.14-2. Construction Schedule .......... 9.2.14-11
Table 9.2.14-3. Off-Road Equipment Use Assumptions .......... 9.2.14-12
Table 9.2.14-4. Vehicle Trip Assumptions .......... 9.2.14-14
Table 9.2.14-5. Employee Commute Vehicle Type and Fuel Type Assumptions .......... 9.2.14-15
Table 9.2.14-6. Helicopter Use Assumptions .......... 9.2.14-16
Table 9.2.14-7. Project Criteria Pollutant and GHG Emissions .......... 9.2.14-17

## LIST OF ACRONYMS

| | |
|---|---|
| CalEEMod | California Emissions Estimator Model |
| CalEPA | California Environmental Protection Agency |
| CAPCOA | California Air Pollution Control Officers Association |
| CARB | California Air Resources Board |
| CO | carbon monoxide |
| CY | cubic yard |
| DPM | diesel particulate matter |
| FCAA | Federal Clean Air Act |
| GBUAPCD | Great Basin Unified Air Pollution Control District |
| GHG | greenhouse gas |
| $MTCO_2e$ | metric tons of carbon dioxide equivalents |
| NAAQS | National Ambient Air Quality Standards |
| $NO_x$ | oxides of nitrogen |
| OEHHA | Office of Environmental Health Hazard Assessment |
| $O_3$ | ozone |
| Pb | lead |
| $PM_{2.5}$ | particulates with a diameter of 2.5 microns or less |
| $PM_{10}$ | particulates with a diameter of 10 microns or less |
| Project | Rush Creek Project |
| ROG | reactive organic gases |
| SCE | Southern California Edison Company |
| SIP | State Implementation Plan |
| SJVAPCD | San Joaquin Valley Air Pollution Control District |
| $SO_2$ | sulfur dioxide |
| TAC | toxic air contaminants |
| TPY | tons per year |
| VMT | vehicle miles traveled |

### 9.2.14 Air Quality – Construction Effects

This section describes the potential construction-related effects to air quality that could occur because of Project facility modifications to be implemented under the Proposed Action for Southern California Edison Company's (SCE) Rush Creek Project (Project). A description of Project facility modifications, including restoration activities, to be implemented under the Proposed Action is included in Section 5 and Appendix 5-A.

Potential effects are determined by analyzing the changes in air quality that may result from activities to be implemented under the Proposed Action compared to the No-Action Alternative (existing condition) (Section 4). Final effects determinations consider construction measures included to avoid or mitigate impacts associated with construction activities (refer to Section 5, Appendix 5-B). Unavoidable adverse effects are discussed at the end of this section.

The following potential effects to air quality associated with Project facility modifications were evaluated:

- Potential air quality impacts caused by operation of off-road construction equipment and on-road vehicles.
- Potential increase in fugitive dust emissions because of demolition and construction activities.
- Potential health risks or environmental justice concerns due to toxic air contaminant (TAC) emissions.
- Potential greenhouse gas (GHG) impacts caused by operation of off-road construction equipment and on-road vehicles.

#### 9.2.14.1 Approach to Analysis

The following section describes the approach used to determine air quality impacts associated with emissions from construction activities.

Under the Proposed Action, several facility modifications would take place. Additionally, to facilitate construction activities at each location, the June Mountain Ski Area Parking Lot would serve as a Base of Operations for each construction season. Further detail regarding each facility modification and the details of construction are available in Section 5 and Appendix 5-A. Criteria pollutant and GHG emissions were estimated for each of the following construction sites:

- Rush Meadows Dam (Partial Removal)
- Agnew Dam (Partial Removal)
- Gem Dam Retrofit

- June Mountain Base of Operations

The emission estimations incorporate conservative assumptions to evaluate a reasonable worst-case scenario, including the following:

- Where off-road equipment hours of use were not specified, a full 10 hours was assumed.
- Emissions factors for the earlier possible year that the construction activity may occur were used. This is conservative because off-road equipment and on-road vehicles generally become more efficient over time as construction fleets are updated and emissions standards become more stringent.

Annual emissions in units of tons per year (TPY) were estimated for the following criteria pollutants:

- Oxides of Nitrogen ($NO_x$)
- Ozone ($O_3$)[1]
- Sulfur Dioxide ($SO_2$)
- Carbon Monoxide (CO)
- Particulates ($PM_{2.5}$)
- Particulates ($PM_{10}$)

In addition, annual emissions were estimated for GHG emissions in units of metric tons of carbon dioxide equivalents ($MTCO_2e$) per year.

To evaluate the impact of the Project facility modifications on air quality, estimated emissions were compared to the applicable significance thresholds identified in Table 9.2.14-1. The significance criteria are based on the attainment status of criteria pollutants and the conformity determinations for federal actions (40 CFR 51.853).

The Mono Basin Planning Area, in which the Project is located, is designated as moderate nonattainment of the state and federal $PM_{10}$ standard, and Mono County is a nonattainment area for the state standard for ozone (CARB 2024). As required by the Federal Clean Air Act (FCAA), Great Basin Unified Air Pollution Control District (GBUAPCD) adopted a State Implementation Plan (SIP) that demonstrates how the Mono Basin Planning Area will achieve the $PM_{10}$ National Ambient Air Quality Standards (NAAQS) (GBUAPCD 1995). This analysis will evaluate consistency with the Mono Basin

[1] It is noted that the construction activities would emit ozone precursors ROG and NOx. However, the Project would not directly emit ozone since it is formed in the atmosphere during the photochemical reaction of ozone precursors.

Planning Area $PM_{10}$ SIP to determine whether implementation of the Project facility modifications would hinder attainment of the NAAQS.

The GBUAPCD has not adopted thresholds of significance for use in environmental analyses. For this analysis, to help provide context, construction emissions are also compared to the thresholds that were adopted by the nearby San Joaquin Valley Air Pollution Control District (SJVAPCD) (see Table 9.2.14-1). The SJVAPCD regulates air quality in eight counties, including: Fresno, Kern (western and central), Kings, Madera, Merced, San Joaquin, Stanislaus, and Tulare. The SJVAPCD Guide for Assessing and Mitigating Air Quality Impacts, adopted in March 2015, presents the thresholds of significance for criteria air pollutants (SJVAPCD 2015).

### 9.2.14.2 Modeling Assumptions

It is anticipated that partial removal of Rush Meadows and Agnew dams would each require one construction season and retrofitting of Gem Dam would require three construction seasons (total of five construction seasons). Construction activities would occur in series and would not overlap. The construction season would extend from approximately June 1 to October 31, depending on weather and snow conditions. The modeled construction schedule is presented in Table 9.2.14-2. In addition, the assumptions for heavy equipment usage, employee commutes and haul truck trip rates, employee vehicle type assumptions, and helicopter use are available in Table 9.2.14-3, Table 9.2.14-4, Table 9.2.14-5, and Table 9.2.14-6, respectively.

For Rush Meadows Dam, 55 cubic yards (CY) of concrete/shotcrete would be imported to the site, and for Agnew Dam, 35 CY of concrete/shotcrete would be imported. The retrofitting at Gem Dam would require the total import of 2,362 CY of concrete/shotcrete, for an average of 787 CY imported per construction season. No material would be exported from any of the dam sites and is assumed to be reused onsite. It was assumed that all exposed surfaces would be watered twice per day to reduce fugitive dust emissions.

### 9.2.14.3 Emissions Estimate Methodology

Construction emissions were estimated for each Project facility modification by focusing on the three primary sources: off-road emissions; on-road emissions; and helicopter emissions. The methodology used to estimate each source is summarized below.

#### Off-Road Emissions

Each construction site would involve the use of heavy-duty off-road equipment, which includes pieces of equipment such as tractors, backhoes, excavators, etc. Off-road emissions were estimated using the California Emissions Estimator Model (CalEEMod), which is a statewide land use emissions computer model designed to provide a uniform platform for government agencies, land use planners, and environmental professionals to quantify potential criteria pollutant and GHG emissions associated with both construction and operations from a variety of projects. CalEEMod was developed for the California Air Pollution Control Officers Association (CAPCOA) in collaboration with the

California Air Districts. Default data (e.g., emission factors, trip lengths, meteorology, source inventory) have been provided by the various California Air Districts to account for local requirements and conditions. The model can be used for a variety of situations where an air quality analysis is necessary or desirable, such as preparing National Environmental Policy Act documents, conducting pre-project planning, and, verifying compliance with local air quality rules and regulations, etc. CalEEMod Version 2022.1.1.23 was used to estimate construction off-road emissions from each construction site. Refer to Table 9.2.14-3 for the assumptions for off-road equipment use.

Equipment horsepower and load factors were automatically populated with the default average values from the California Air Resources Board's (CARB) OFFROAD2007 and OFFROAD2011. Calendar year average emission factors for diesel, gasoline, and compressed natural gas off-road equipment are derived from CARB's OFFROAD2017-ORION v1.0.1 (CAPCOA 2022).

**On-Road Emissions**

On-road emissions include those associated with automobile use. For the Project facility modifications, this includes staff commutes and heavy truck trips to and from the June Mountain Base of Operations. Refer to Table 9.2.14-4 for the assumptions for automobile use.

Mobile emissions were calculated using the CARB's EMFAC2021 (v1.0.2) database of on-road emission factors. The emission factors were selected for Mono County for the years 2025 through 2029. Should construction commence later than the assumed schedule, emissions are expected to be less due to the increasingly stringent vehicle emissions standards. The factors incorporate emissions from the combustion of fuel, vehicle idling, start-up emissions, as well as particulate emissions associated with tire wear and brake wear.

The fleet mix for employee commutes was calculated based on the vehicle miles traveled (VMT) breakdown for passenger vehicles in Mono County for years 2025 through 2029. The fuel type split (i.e., gasoline, diesel, electric, or plug-in hybrid) was based on the total VMT for the fuel type per vehicle category and per year for Mono County. Table 9.2.14-5 presents the vehicle type and fuel type assumptions for all employee commute trips. All truck trips, including those hauling both hazardous and non-hazardous waste, were modeled to be heavy-heavy duty trucks and were assumed to be 100 percent diesel-fueled.

The trip distance for employee commutes was based on the worst-case scenario that all workers would commute from the City of Bishop, which is approximately 72 miles away from the June Mountain Base of Operations. Workers are assumed to hike or ride mules from Frontier Pack Station at the Rush Creek Trailhead to the work area, remain in the backcountry for a one-week shift, and rotate out once per week.

The truck trip distances were determined based on the disposal location. Non-hazardous waste, which was assumed to constitute 90 percent of the debris, would be transported to the Pumice Valley Landfill, which is located approximately 15 miles from the June Mountain Base of Operations. Hazardous waste was conservatively assumed to be carried 250 miles away to an appropriate hazardous waste facility.

**Helicopter Emissions**

Given the limited access to the Project facilities, helicopters would be used to transport equipment and materials from the June Mountain Base of Operations to each dam location. The following three helicopter models are proposed for use:

- Sikorsky S-64 Skycrane (Heavy-Lift)
- Sikorsky UH-60 (Medium-Lift)
- A-Star/Airbus AS350 (Light-Lift)

Emissions factors for each representative aircraft model per (1) landing and take-off cycle and (2) one hour of flight were derived from the Guidance on the Determination of Helicopter Emissions (2015). The one-way helicopter trip distances were assumed to be 6.4 miles to Rush Meadows Dam, 2.5 miles to Agnew Dam, and 5.3 miles to Gem Dam, as estimated using Google Earth. In addition, each helicopter is assumed to travel from its long-term hangar to the June Mountain Base of Operations once per week. The Sikorsky UH-60 (Medium-Lift) and A-Star/Airbus AS350 (Light-Lift) helicopter hangar locations are assumed to be in the City of Chino, California, approximately 300 miles from the June Mountain Base of Operations. The Sikorsky S-64 Skycrane (Heavy-Lift) hangar location is assumed to be in the Town of Mammoth Lakes, approximately 15 miles from the June Mountain Base of Operations. The assumptions for helicopter use per construction site are presented in Table 9.2.14-6.

### 9.2.14.4 Criteria Pollutant and Fugitive Dust Emissions

Construction activities have the potential to temporarily affect air quality through emissions of criteria pollutants, including fugitive dust emissions. Impacts to air quality would result from engine exhaust and fugitive dust emissions caused by operation of off-road construction equipment, on-road vehicles, and helicopter use. As described previously, criteria air pollutants include $O_3$, CO, $NO_2$, $SO_2$, $PM_{2.5}$, $PM_{10}$, and lead (Pb). Lead would not be emitted during construction activities and, therefore, was not considered in this analysis. $PM_{10}$ refers to all particulate matter less than 10 microns in diameter; thus, $PM_{10}$ includes fugitive dust emissions. Fugitive dust ($PM_{10}$) would be generated from demolition activities, site grading, and other earth-moving activities.

Table 9.2.14-7 summarizes the estimated construction emissions of criteria pollutants as compared to the corresponding federal thresholds and the SJVAPCD thresholds applied in this analysis. As depicted therein, annual emissions during Project facility modification construction activities are well below all established thresholds for criteria pollutants and fugitive dust.

The Mono Basin Planning Area SIP for $PM_{10}$ identified that the region can achieve the NAAQS through two measures: 1) increasing the water elevation at Mono Lake to 6,391 feet and 2) eliminating the deposition of particulate matter in the area between 6,391 to 6,400 feet elevation (GBUAPCD 1995). The Project facility modifications would not result in any changes to the water level at Mono Lake. As measured using Google Earth, the elevation profile of the pathway between the June Mountain Base of Operations, Rush Meadows Dam, Agnew Dam, and Gem Dam ranges from 7,265 to 9,404 feet above sea level. Therefore, fugitive dust emissions would not affect the area between 6,391 to 6,400 feet elevation, and implementation of Project facility modifications would not conflict with the applicable SIP.

Overall, construction emissions would be temporary and intermittent and would cease upon completion of work. Emissions would also be dispersed over a large area that is sparsely populated. SCE will comply with all applicable GBUAPCD rules and regulations regarding construction emissions including, but not limited to, the following: Rule 200, which requires issuance of an Authority to Construct permit; Rule 209-A, which establishes the standards for the issuance of an Authority to Construct Permit; and Rule 401, which requires that fugitive dust emissions be limited to the maximum extent feasible. In addition, standard construction air quality control measures would be implemented during construction, including fugitive dust reduction measures and diesel emissions reduction measures (see Section 5, Appendix 5-B). Therefore, the environmental effects on air quality associated with construction activities implemented under the Proposed Action are considered negligible.

### 9.2.14.5 Potential Health Effects and Environmental Justice

TACs are air pollutants that may cause or contribute to an increase in mortality or serious illness, or which may pose a hazard to human health. TACs are usually present in minute quantities in the ambient air; but due to their high toxicity, they may pose a threat to public health even at very low concentrations. The primary TAC that construction activities may emit is diesel particulate matter (DPM), which was identified as a TAC by CARB in August 1998. DPM is typically composed of carbon particles and numerous organic compounds, including over 40 known cancer-causing organic substances. Diesel exhaust also contains gaseous pollutants, including reactive organic gases (ROG) and $NO_x$.

Some land uses are considered more sensitive to air pollution than others due to the types of population groups or activities involved. Sensitive population groups include children, the elderly, the acutely ill, and the chronically ill, especially those with cardiovascular diseases. Examples of sensitive receptors include hospitals, residences, convalescent facilities, and schools.

There are no sensitive receptors near any of the dam locations. The closest receptors to the June Mountain Base of Operations are located in the community of June Lake, and specifically include the neighborhood of single-family residences located to the west of the parking area, off of June Lake Loop. The nearest receptor is approximately 2,000 feet west of the Base of Operations. According to the CARB, the concentration of DPM declines dramatically after 500 feet of separation (CARB 2005). There are no sensitive receptors within 500 feet of the dam sites or the Base of Operations that could be exposed to diesel emission exhaust or other TACs during construction.

The California Environmental Protection Agency (CalEPA) has identified that many communities across the state are subjected to a disproportionate burden of pollution based on proximity to nearby sources, exposure to polluted air and/or water, and regional topographic features that affect the spread of pollutants, among other variables. Some of these communities experience the additional burden of socioeconomic stressors and health conditions that render them more vulnerable to the impacts of pollution. The Office of Environmental Health Hazard Assessment (OEHHA) has developed the California Environmental Screening Tool, which estimates cumulative impacts associated with both pollution exposure as well as socioeconomic factors in order to identify communities in which environmental justice concerns are prevalent (OEHHA 2021). The tool considers several metrics and establishes a CalEnviroScreen score for each census tract in the state and assigns an associated percentile to determine each census tract's score compared to the remainder of the state. According to OEHHA's CalEnviroScreen 4.0, the Project area, including the community of June Lake, is located within a census tract with a CalEnviroScreen 4.0 percentile of 30 (OEHHA 2024). This means that only 30 percent of census tracts in the state have lower values, and it can be reasonably concluded that residents located in the Project area are not subjected to disproportionate burden of pollution and/or environmental justice concerns.

Based on the above, the emissions generated from Project facility modifications would not result in an increased health impact to the communities, and would not result in a disproportionate pollution burden to the existing community.

### 9.2.14.6 Greenhouse Gas Emissions

GHG emissions would be generated during construction activities from the combustion of petroleum fuels to power on-road vehicles, off-road equipment, and helicopters. As presented in Table 9.2.14-7, implementation of the Project facility modifications would generate a total of 13,382.98 $MTCO_2e$, or an average of 2,676.60 $MTCO_2e$ per year.

A quantitative threshold for determining a project's significance has not been established at the state or federal level. Additionally, neither GBUAPCD nor SJVAPCD have adopted numerical thresholds of significance for GHG emissions. Nevertheless, consistent with other recent FERC environmental analyses,[2] this analysis discloses the GHG emissions

[2] See Section 3.3.11, Air Quality and Climate Change, of the Final Environmental Impact Statements for Hydropower License for the Goldendale Energy Storage Project – FERC Project No. 14861-002. Available online at: https://elibrary.ferc.gov/eLibrary/filelist?accession_number=20240208-3036. Accessed June 2024.

associated with Project facility modifications in comparison to state and national GHG emission inventories.

As noted in Section 7.15, Air Quality Affected Environment, in 2021, GHG emissions in the state of California totaled 381.3 million $MTCO_2e$ (CARB 2023). In that same year, net GHG emissions in the United States totaled 5,586 million $MTCO_2e$ (USEPA 2024a). In comparison to the state and national GHG emissions inventories, total GHG emissions from Project facility modifications would constitute 0.00070 and 0.00005 percent of total inventoried emissions, respectively. While GHG emissions and global climate change are inherently cumulative impacts, the incremental contribution of Project facility modification construction emissions in the context of statewide and national emissions is negligible.

#### 9.2.14.7 Construction Measures

To avoid or reduce effects from construction activities on air quality, SCE will implement fugitive dust and diesel exhaust emissions measures. A complete list of construction measures is included in Section 5, Appendix 5-B.

#### 9.2.14.8 Unavoidable Adverse Effects

There are no unavoidable adverse effects to air quality as a result of Project facility modifications to be implemented under the Proposed Action.

#### 9.2.14.9 References

California Air Pollution Control Officers Association (CAPCOA). 2022. California Emissions Estimator Model User Guide Version 2022.1. Available online at: https://caleemod.com/documents/user-guide/01_User%20Guide.pdf. Accessed May 2024.

California Air Resources Board (CARB). 2005. Air Quality and Land Use Handbook: A Community Health Perspective. Available online at: https://ww2.arb.ca.gov/sites/default/files/2023-05/Land%20Use%20Handbook_0.pdf. Accessed May 2024.

_____. 2023. California Greenhouse Gas Emissions from 2000 to 2021: Trends of Emissions and Other Indicators. Available online at: https://ww2.arb.ca.gov/sites/default/files/2023-12/2000_2021_ghg_inventory_trends.pdf. Accessed June 2024.

_____. 2024. Maps of State and Federal Area Designations. Available online at: https://ww2.arb.ca.gov/resources/documents/maps-state-and-federal-area-designations. Accessed March 2024.

Great Basin Unified Air Pollution Control District (GBUAPCD). 1995. Mono Basin Planning Area PM-10 State Implementation Plan. Available online at: https://www.gbuapcd.org/Docs/District/AirQualityPlans/MonoBasin/Mono%20Basin%20PM-10_SIP.pdf. Accessed June 2024.

Office of Environmental Health Hazard Assessment (OEHHA). 2021. CalEnviroScreen 4.0. Available online at: https://oehha.ca.gov/media/downloads/calenviroscreen/report/calenviroscreen40reportf2021.pdf. Accessed May 2024.

_____. 2024. CalEnviroScreen from OEHHA. Available online at: https://experience.arcgis.com/experience/11d2f52282a54ceebcac7428e6184203/page/CalEnviroScreen-4_0/. Accessed May 2024.

San Joaquin Valley Air Pollution Control District (SJVAPCD). 2015. Guidance for Assessing and Mitigating Air Quality Impacts. Available online at: https://ww2.valleyair.org/media/g4nl3p0g/gamaqi.pdf. Accessed May 2024.

Swiss Confederation. 2015. Guidance on the Determination of Helicopter Emissions.

U.S. Environmental Protection Agency (USEPA). 2024a. Sources of GHG Emissions. Available online at: https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions. Accessed June 2024.

_____. 2024b. General Conformity, De Minimis Tables. Available online at: https://www.epa.gov/general-conformity/de-minimis-tables. Accessed July 2024.

# TABLES

## Table 9.2.14-1. Thresholds of Significance for Criteria Pollutants

| Pollutant | Federal di minimis Threshold[1] (TPY) | SJVAPCD Construction Threshold[2] (TPY) |
|---|---|---|
| Ozone (NOx) | 100 | 10 |
| Ozone (ROG) | 100 | 10 |
| $SO_2$ (SOx) | 100 | 27 |
| CO | 100 | 100 |
| $PM_{2.5}$ | 100 | 15 |
| $PM_{10}$ | 100 | 15 |

Sources:
[1] USEPA 2024b
[2] SJVAPCD 2015

## Table 9.2.14-2. Construction Schedule

| Phase | Start Date | End Date |
|---|---|---|
| **Rush Meadows Dam Removal** | | |
| Mobilization | 6/1/2025 | 6/14/2025 |
| Construction | 6/15/2025 | 10/16/2025 |
| Demobilization | 10/17/2025 | 10/31/2025 |
| **Agnew Dam Removal** | | |
| Mobilization | 6/1/2026 | 6/14/2026 |
| Construction | 6/15/2026 | 10/16/2026 |
| Demobilization | 10/17/2026 | 10/31/2026 |
| **Gem Dam Retrofit** | | |
| Mobilization | 6/1/2027 | 6/14/2027 |
| Construction | 6/15/2027 | 10/16/2027 |
| Demobilization | 10/17/2027 | 10/31/2027 |
| Mobilization | 6/1/2028 | 6/14/2028 |
| Construction | 6/15/2028 | 10/16/2028 |
| Demobilization | 10/17/2028 | 10/31/2028 |
| Mobilization | 6/1/2029 | 6/14/2029 |
| Construction | 6/15/2029 | 10/16/2029 |
| Demobilization | 10/17/2029 | 10/31/2029 |
| **June Mountain Base of Operations** | | |
| Season 1 Project Support | 6/1/2025 | 10/31/2025 |
| Season 2 Project Support | 6/1/2026 | 10/31/2026 |
| Season 3 Project Support | 6/1/2027 | 10/31/2027 |
| Season 4 Project Support | 6/1/2028 | 10/31/2028 |
| Season 5 Project Support | 6/1/2029 | 10/31/2029 |

**Table 9.2.14-3. Off-Road Equipment Use Assumptions**

| Phase | CalEEMod Equipment Type | Quantity | Hours per Day | HP | Load Factor |
|---|---|---|---|---|---|
| **Rush Meadows Dam Removal** | | | | | |
| Mobilization | Excavators | 1 | 10 | 148 | 0.41 |
| Mobilization | Pumps | 1 | 5 | 84 | 0.37 |
| Mobilization | Other Construction Equipment | 9 | 10 | 82 | 0.42 |
| Construction | Excavators | 3 | 10 | 367 | 0.29 |
| Construction | Dumpers/Tenders | 2 | 10 | 82 | 0.2 |
| Construction | Cranes | 1 | 5 | 84 | 0.37 |
| Construction | Cement and Mortar Mixers | 1 | 5 | 10 | 0.56 |
| Construction | Pumps | 2 | 5 | 11 | 0.74 |
| Construction | Off-Highway Trucks | 2 | 2 | 376 | 0.38 |
| Construction | Welders | 1 | 5 | 46 | 0.45 |
| Construction | Other Construction Equipment | 9 | 10 | 82 | 0.42 |
| Demobilization | Other Construction Equipment | 9 | 10 | 82 | 0.42 |
| **Agnew Dam Removal** | | | | | |
| Mobilization | Excavators | 1 | 10 | 148 | 0.41 |
| Mobilization | Pumps | 1 | 5 | 84 | 0.37 |
| Mobilization | Other Construction Equipment | 8 | 10 | 82 | 0.42 |
| Construction | Excavators | 3 | 10 | 367 | 0.29 |
| Construction | Dumpers/Tenders | 2 | 10 | 82 | 0.2 |
| Construction | Cranes | 1 | 5 | 84 | 0.37 |
| Construction | Cement and Mortar Mixers | 1 | 5 | 10 | 0.56 |
| Construction | Pumps | 2 | 5 | 11 | 0.74 |
| Construction | Off-Highway Trucks | 2 | 2 | 376 | 0.38 |
| Construction | Welders | 1 | 5 | 46 | 0.45 |
| Construction | Other Construction Equipment | 8 | 10 | 82 | 0.42 |
| Demobilization | Other Construction Equipment | 8 | 10 | 82 | 0.42 |
| **Gem Dam Retrofit**[1] | | | | | |
| Mobilization | Excavators | 1 | 10 | 36 | 0.38 |
| Mobilization | Pumps | 1 | 5 | 84 | 0.37 |
| Mobilization | Other Construction Equipment | 9 | 10 | 82 | 0.42 |
| Construction | Excavators | 3 | 10 | 367 | 0.29 |
| Construction | Dumpers/Tenders | 2 | 10 | 82 | 0.2 |
| Construction | Cranes | 1 | 5 | 84 | 0.37 |
| Construction | Cement and Mortar Mixers | 1 | 5 | 83 | 0.5 |
| Construction | Pumps | 2 | 5 | 46 | 0.31 |
| Construction | Off-Highway Trucks | 1 | 5 | 10 | 0.56 |
| Construction | Welders | 2 | 5 | 11 | 0.74 |
| Construction | Other Construction Equipment | 2 | 2 | 376 | 0.38 |

| Phase | CalEEMod Equipment Type | Quantity | Hours per Day | HP | Load Factor |
|---|---|---|---|---|---|
| Construction | Bore/Drill Rigs | 1 | 5 | 46 | 0.45 |
| Construction | Aerial Lifts | 12 | 10 | 82 | 0.42 |
| Demobilization | Other Construction Equipment | 9 | 10 | 82 | 0.42 |
| **June Mountain Base of Operations[2]** | | | | | |
| Project Support | Excavators | 1 | 5 | 36 | 0.38 |
| Project Support | Generator Sets | 2 | 10 | 14 | 0.74 |
| Project Support | Forklifts | 1 | 5 | 82 | 0.2 |
| Project Support | Cement and Mortar Mixers | 1 | 10 | 10 | 0.56 |
| Project Support | Off-Highway Trucks | 1 | 5 | 376 | 0.38 |
| Project Support | Off-Highway Trucks | 2 | 1 | 376 | 0.38 |
| Project Support | Tractors/Loaders/Backhoes | 1 | 5 | 84 | 0.37 |
| Project Support | Off-Highway Trucks | 1 | 4 | 376 | 0.38 |
| Project Support | Other General Industrial Equipment | 1 | 10 | 35 | 0.34 |
| Project Support | Other Construction Equipment | 2 | 10 | 82 | 0.42 |
| Project Support | Sweepers/Scrubbers | 1 | 5 | 36 | 0.46 |

Notes:
[1] Each construction season at Gem Dam is expected to involve similar off-road equipment.
[2] Each construction season at the June Mountain Base of Operations is expected to involve similar off-road equipment.

## Table 9.2.14-4. Vehicle Trip Assumptions

| Phase | Trip Type | Vehicle Type | Trips per Season | One-Way Trip Distance (miles) | Vehicle Miles Traveled |
|---|---|---|---|---|---|
| **Rush Meadows Dam Removal** | | | | | |
| Mobilization | Employee Commute | LDA, LDT1, LDT2 | 24 | 72 | 3,456 |
| Mobilization | Construction Truck | HHDT | 25 | 153 | 7,650 |
| Construction | Employee Commute | LDA, LDT1, LDT2 | 216 | 72 | 31,104 |
| Construction | Construction Truck | HHDT | 195 | 153 | 59,670 |
| Construction | Non-Haz Waste Truck | HHDT | 15 | 15 | 450 |
| Construction | Haz Waste | HHDT | 1 | 250 | 500 |
| Demobilization | Employee Commute | LDA, LDT1, LDT2 | 24 | 72 | 3,456 |
| Demobilization | Construction Truck | HHDT | 25 | 153 | 7,650 |
| *Totals* | *Employee Commutes* | *LDA, LDT1, LDT2* | *264* | - | *38,016* |
| | *Truck Trips* | *HHDT* | *261* | - | *75,920* |
| **Agnew Dam Removal** | | | | | |
| Mobilization | Employee Commute | LDA, LDT1, LDT2 | 24 | 72 | 3,456 |
| Mobilization | Construction Truck | HHDT | 25 | 153 | 7,650 |
| Construction | Employee Commute | LDA, LDT1, LDT2 | 216 | 72 | 31,104 |
| Construction | Construction Truck | HHDT | 13 | 153 | 3,978 |
| Construction | Non-Haz Waste Truck | HHDT | 12 | 15 | 360 |
| Construction | Haz Waste | HHDT | 1 | 250 | 500 |
| Demobilization | Employee Commute | LDA, LDT1, LDT2 | 24 | 72 | 3,456 |
| Demobilization | Construction Truck | HHDT | 25 | 153 | 7,650 |
| *Totals* | *Employee Commutes* | *LDA, LDT1, LDT2* | *264* | - | *38,016* |
| | *Truck Trips* | *HHDT* | *76* | - | *20,138* |
| **Gem Dam Retrofit** | | | | | |
| Mobilization | Employee Commute | LDA, LDT1, LDT2 | 72 | 72 | 10,368 |
| Mobilization | Construction Truck | HHDT | 165 | 153 | 50,490 |
| Construction | Employee Commute | LDA, LDT1, LDT2 | 648 | 72 | 93,312 |
| Construction | Construction Truck | HHDT | 1335 | 153 | 408,510 |
| Construction | Non-Haz Waste Truck | HHDT | 165 | 15 | 4,950 |
| Construction | Haz Waste | HHDT | 9 | 250 | 4,500 |
| Demobilization | Employee Commute | LDA, LDT1, LDT2 | 72 | 72 | 10,368 |
| Demobilization | Construction Truck | HHDT | 165 | 153 | 50,490 |
| *Totals* | *Employee Commutes* | *LDA, LDT1, LDT2* | *792* | - | *114,048* |
| | *Truck Trips* | *HHDT* | *1839* | - | *518,940* |

Note: LDA refers to passenger cars. LDT1 and LDT2 refer to light-duty trucks. HHDT refers to heavy-heavy duty trucks.

**Table 9.2.14-5. Employee Commute Vehicle Type and Fuel Type Assumptions**

| Calendar Year | Vehicle Category[1] | Vehicle Category Breakdown[2] | Fuel Type | Fuel Type Breakdown[2,3] |
|---|---|---|---|---|
| 2025 | LDA | 59.8% | Gasoline | 89.4% |
| | | | Electricity | 7.0% |
| | | | Plug-in Hybrid | 3.2% |
| | LDT1 | 6.2% | Gasoline | 100.0% |
| | LDT2 | 34.0% | Gasoline | 98.0% |
| | | | Electricity | 0.6% |
| | | | Plug-in Hybrid | 1.0% |
| 2026 | LDA | 60.0% | Gasoline | 88.7% |
| | | | Electricity | 7.6% |
| | | | Plug-in Hybrid | 3.4% |
| | LDT1 | 5.9% | Gasoline | 100.0% |
| | LDT2 | 34.0% | Gasoline | 97.7% |
| | | | Electricity | 0.7% |
| | | | Plug-in Hybrid | 1.1% |
| 2027 | LDA | 60.3% | Gasoline | 88.1% |
| | | | Electricity | 8.1% |
| | | | Plug-in Hybrid | 3.5% |
| | LDT1 | 5.7% | Gasoline | 100.0% |
| | LDT2 | 34.1% | Gasoline | 97.5% |
| | | | Electricity | 0.9% |
| | | | Plug-in Hybrid | 1.2% |
| 2028 | LDA | 60.5% | Gasoline | 87.6% |
| | | | Electricity | 8.6% |
| | | | Plug-in Hybrid | 3.7% |
| | LDT1 | 5.4% | Gasoline | 100.0% |
| | LDT2 | 34.1% | Gasoline | 97.2% |
| | | | Electricity | 1.0% |
| | | | Plug-in Hybrid | 1.4% |
| 2029 | LDA | 60.7% | Gasoline | 87.0% |
| | | | Electricity | 9.0% |
| | | | Plug-in Hybrid | 3.7% |
| | LDT1 | 5.2% | Gasoline | 100.0% |
| | LDT2 | 34.1% | Gasoline | 96.9% |
| | | | Electricity | 1.2% |
| | | | Plug-in Hybrid | 1.5% |

Notes:
[1] LDA refers to passenger cars. LDT1 and LDT2 refer to light-duty trucks.
[2] Vehicle category breakdown and fuel type breakdown were calculated from data for Mono County from the EMFAC2021 (v1.0.2) database.
[3] For the LDT1 vehicle category, the VMT per fuel type was determined to be 99 percent or greater for gasoline. For this analysis, 100 percent of trips in LDT1 vehicles were assumed to be gasoline-fueled.

## Table 9.2.14-6. Helicopter Use Assumptions

| Helicopter Model | Trips per Season | Route Length (miles round trip) | Annual Mileage | Cruising Speed[1] | Annual Hours of Operation |
|---|---|---|---|---|---|
| **Rush Meadows Dam Removal** | | | | | |
| Sikorsky S-64 Skycrane | 94 | 12.8 | 1,203.2 | 115 | 10.5 |
| A-Star/Airbus AS350 | 56 | 12.8 | 716.8 | 140 | 5.1 |
| **Agnew Dam Removal** | | | | | |
| Sikorsky S-64 Skycrane | 75 | 5.0 | 375.0 | 115 | 3.3 |
| A-Star/Airbus AS350 | 35 | 5.0 | 175.0 | 140 | 1.3 |
| **Gem Dam Retrofit** | | | | | |
| Sikorsky S-64 Skycrane | 380 | 10.6 | 4,028.0 | 115 | 35.0 |
| A-Star/Airbus AS350 | 204 | 10.6 | 2,162.4 | 140 | 15.4 |
| **June Mountain Base of Operations[2]** | | | | | |
| Sikorsky S-64 Skycrane | -- | -- | -- | 115 | 194.87 |
| Black Hawk/Sikorsky UH-60 | -- | -- | -- | 140 | 209.14 |
| A-Star/Airbus AS350 | -- | -- | -- | 140 | 1,150.29 |

Notes:
[1] Cruising speeds are from model-specific technical specification sheets (Erickson 2023; Sikorsky 2016; Eurocopter 2009).
[2] The helicopter emissions for the June Mountain Base of Operations were based on (1) annual hours of operation on-site; and (2) weekly helicopter commutes between the June Mountain Base of Operations and hangar location.

**Table 9.2.14-7. Project Criteria Pollutant and GHG Emissions**

| Year | Construction Site | Emissions Source | Emissions (TPY) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | **NOx** | **ROG** | **SOx** | **CO** | **$PM_{2.5}$** | **$PM_{10}$** | **$CO_2e$** |
| 2025 | June Mountain | Off-Road Equipment | 0.92 | 0.12 | - | 1.04 | 0.04 | 0.04 | 215.67 |
| | | Helicopter | 0.08 | 0.02 | - | 0.03 | 0.13 | 0.13 | 1,624.91 |
| | Rush Meadows | Off-Road Equipment | 2.00 | 0.23 | 0.01 | 2.35 | 0.10 | 0.10 | 479.02 |
| | | Helicopter | 0.23 | 0.05 | - | 0.06 | 0.01 | 0.01 | 94.45 |
| | | Mobile Emissions | 0.06 | - | 0.18 | 0.05 | 0.21 | 0.01 | 77.68 |
| *2025 Annual Total* | | | *3.30* | *0.43* | *0.18* | *3.52* | *0.48* | *0.29* | *2,491.72* |
| 2026 | June Mountain | Off-Road Equipment | 0.92 | 0.12 | - | 1.04 | 0.04 | 0.04 | 215.67 |
| | | Helicopter | 0.08 | 0.02 | - | 0.03 | 0.13 | 0.13 | 1,624.91 |
| | Agnew Dam | Off-Road Equipment | 1.86 | 0.22 | - | 2.17 | 0.09 | 0.10 | 454.95 |
| | | Helicopter | 0.18 | 0.03 | - | 0.04 | 0.01 | 0.01 | 53.31 |
| | | Mobile Emissions | 0.04 | - | 0.17 | 0.01 | 0.06 | - | 71.89 |
| *2026 Annual Total* | | | *3.09* | *0.40* | *0.17* | *3.29* | *0.33* | *0.27* | *2,420.73* |
| 2027 | June Mountain | Off-Road Equipment | 0.92 | 0.12 | - | 1.04 | 0.04 | 0.04 | 215.67 |
| | | Helicopter | 0.08 | 0.02 | - | 0.03 | 0.13 | 0.13 | 1,624.91 |
| | Gem Dam | Off-Road Equipment | 2.16 | 0.25 | 0.01 | 2.88 | 0.09 | 0.10 | 555.93 |
| | | Helicopter | 0.93 | 0.18 | - | 0.22 | 0.04 | 0.04 | 349.13 |
| | | Mobile Emissions | 0.09 | 0.01 | 0.15 | 0.11 | 0.45 | 0.01 | 77.87 |
| *2027 Annual Total* | | | *4.19* | *0.58* | *0.16* | *4.28* | *0.75* | *0.32* | *2,823.51* |
| 2028 | June Mountain | Off-Road Equipment | 0.92 | 0.12 | - | 1.04 | 0.04 | 0.04 | 215.67 |
| | | Helicopter | 0.08 | 0.02 | - | 0.03 | 0.13 | 0.13 | 1,624.91 |
| | Gem Dam | Off-Road Equipment | 2.16 | 0.25 | 0.01 | 2.88 | 0.09 | 0.10 | 555.93 |
| | | Helicopter | 0.93 | 0.18 | - | 0.22 | 0.04 | 0.04 | 349.13 |
| | | Mobile Emissions | 0.09 | 0.01 | 0.15 | 0.11 | 0.45 | 0.01 | 77.87 |
| *2028 Annual Total* | | | *4.19* | *0.58* | *0.16* | *4.28* | *0.75* | *0.32* | *2,823.51* |
| 2029 | June Mountain | Off-Road Equipment | 0.92 | 0.12 | - | 1.04 | 0.04 | 0.04 | 215.67 |
| | | Helicopter | 0.08 | 0.02 | - | 0.03 | 0.13 | 0.13 | 1,624.91 |
| | Gem Dam | Off-Road Equipment | 2.16 | 0.25 | 0.01 | 2.88 | 0.09 | 0.10 | 555.93 |
| | | Helicopter | 0.93 | 0.18 | - | 0.22 | 0.04 | 0.04 | 349.13 |
| | | Mobile Emissions | 0.09 | 0.01 | 0.15 | 0.11 | 0.45 | 0.01 | 77.87 |
| *2029 Annual Total* | | | *4.19* | *0.58* | *0.16* | *4.28* | *0.75* | *0.32* | *2,823.51* |
| *Project Total (tons)* | | | *18.96* | *2.55* | *0.82* | *19.64* | *3.05* | *1.53* | *13,382.98* |
| Federal di minimis Threshold (TPY) | | | 100 | 100 | 100 | 100 | 100 | 100 | N/A |
| SJVAPCD Construction Threshold (TPY) | | | 10 | 10 | 27 | 100 | 15 | 15 | N/A |
| **Exceeds Thresholds?** | | | **No** | **No** | **No** | **No** | **No** | **No** | **N/A** |

## TABLE OF CONTENTS

Page

9.2.15 Noise – Construction Effects .......... 9.2.15-1
9.2.15.1 Approach to Analysis .......... 9.2.15-1
9.2.15.2 Potential Effect to Noise Sensitive Areas .......... 9.2.15-2
9.2.15.3 Construction Measures .......... 9.2.15-6
9.2.15.4 Unavoidable Adverse Effects .......... 9.2.15-6
9.2.15.5 References 9.2.15-6

## LIST OF TABLES

Table 9.2.15-1. Helicopter Noise Levels .......... 9.2.15-8

Table 9.2.15-2. Typical Construction Equipment Noise Levels at Various Distances .......... 9.2.15-8

Table 9.2.15-3. Sound Levels Due to Truck Hauling .......... 9.2.15-8

Table 9.2.15-4. Ambient Noise Levels and Project-Induced Noise .......... 9.2.15-9

## LIST OF MAPS

Map 9.2.15-1. Single-Event 60 dB Lmax Exposure From Construction Noise Sources .......... 9.2.15-11

Map 9.2.15-2. Single-Event 60 dB and 80dB Lmax Exposure from Helicopter Noise Sources .......... 9.2.15-12

## LIST OF ACRONYMS

| | |
|---|---|
| dB | decibel |
| FHWA | Federal Highway Administration |
| lbs | pounds |
| $L_{eq}$ | Equivalent Sound Level |
| $L_{max}$ | Maximum Sound Level |
| POI | Point of Interest |
| Project | Rush Creek Project |
| RCNM | Road Construction Noise Model |
| SCE | Southern California Edison Company |
| SEL | sound exposure level |
| SR-158 | State Route 158 |
| TSP | Technical Study Plan |

### 9.2.15 Noise – Construction Effects

This section describes the potential construction-related noise effects associated with Project facility modifications to be implemented under the Proposed Action for Southern California Edison Company's (SCE) Rush Creek Project (Project). A description of Project facility modifications, including restoration activities, to be implemented under the Proposed Action is included in Section 5 and Appendix 5-A.

Potential effects are determined by analyzing the changes in noise that may result from activities to be implemented under the Proposed Action compared to the No-Action Alternative (existing condition) (Section 4). Final effects determinations consider construction measures to be included to avoid or mitigate impacts associated with construction activities (refer to Section 5, Appendix 5-B). Unavoidable adverse effects are discussed at the end of this section.

The following potential effects to noise sensitive areas from Project facility modifications were evaluated:

- Temporary noise from ground operated construction equipment
- Temporary noise from truck hauling of materials and equipment
- Temporary noise from helicopter use for movement of equipment and material

This section relies on data collected in 2023 as part of the LAND 2 – Noise Technical Study Plan (TSP). Certain components of the LAND 2 – Noise TSP were not able to be completed in 2023. Specifically, to adequately describe the ambient noise environment, the TSP identified that ambient noise measurements be performed at each Point of Interest (POI) in June, August, and October – corresponding to the early, peak, and end of the recreational season, respectively. In the spring of 2023 local stakeholders expressed concern that the substantial snowpack in 2023 and associated high runoff created an ambient noise environment not representative of typical conditions. As a result, the June and August 2023 noise measurements were rescheduled for June and August 2024. Because power generation and creek flow rates had normalized by September 2023, the October 2023 measurements were conducted on schedule. Data collected in 2024 will be analyzed and reported following the end of the 2024 field season. Results from 2024 studies will be provided in an updated technical study report to be included in the Final License Application. In addition, this analysis will be updated, as appropriate, in the Final License Application.

#### 9.2.15.1 Approach to Analysis

The analysis utilized software modeling to predict construction-related noise to compare to measured ambient noise levels. As described in detail in the Draft LAND 2 – Noise Technical Study Report (LAND 2 – TSR; SCE 2024), the modeling of helicopter operations was accomplished with the Department of Defense's officially approved Noisemap suite of programs, which is also approved for noise impact analysis by the

Federal Aviation Administration (DoD 2022, FAA 2020). Noise levels are computed in the time domain and with a variety of integrated metrics, including:

- **Maximum Sound Level** ($L_{max}$): the greatest sound level measured during a single noise event),
- **Sound Exposure Level** (SEL): the total sound energy equated to a reference duration of 1 second, and
- **Equivalent Sound Level** ($L_{eq}$): a “cumulative” metric that combines a series of noise events representing the decibel average of all sounds in a specified time period at receiver positions located at specific POI Common periods for $L_{eq}$ include 10-minute, 1-hour, and 24-hour durations.

The analysis of ground operated construction equipment uses the Federal Highway Administration’s (FHWA) Road Construction Noise Model (RCNM) to calculate the single-event and hourly noise levels generated by construction equipment (FHWA 2006). The RCNM software allows the calculation of noise levels at user-entered distances from various types of construction equipment for sound propagation paths over flat ground, providing outputs for $L_{max}$ and $L_{eq(1hr)}$ metrics reported at regular intervals measured from the operating construction equipment.

The analysis of truck haul routes uses the FHWA’s RCNM software to calculate the single-event $L_{max}$ of a passing truck at various distances from the road, as described in the LAND 2 – TSR (SCE 2024).

### 9.2.15.2 Potential Effect to Noise Sensitive Areas

Project facility modification and restoration activities would temporarily generate noise from the use of construction equipment, truck hauling and helicopters. During Project facility modifications, comprising a total of five construction seasons (June 1 through October 31), a Base of Operations at the June Mountain Ski Area Parking Lot would be established. The Base of Operations would be located along State Route 158 (SR-158), approximately four miles from the south junction of United States Route 395 and SR-158 and would function as the transportation hub for construction activities. The Base of Operations would include a construction trailer, helicopter landing site, use of supporting construction equipment, and staging and stockpile areas. Construction work areas would also be established at Rush Meadows Dam, Gem Dam, and Agnew Dam, which are all located in the backcountry and are not accessible by road.

Activities at the Base of Operations include the use of construction equipment to accept deliveries of equipment and materials and managing staging and stockpile areas. In addition, trucks would deliver construction equipment and materials and transport construction debris to/from the Base of Operations. Trucks would access the Base of Operations via SR-158 using the northern route of the June Lake Loop Road to avoid traffic through the community of June Lake.

Additionally, due to the remote location, construction equipment and materials would be transported from the Base of Operations to the dam construction sites via helicopter. Specifically:

- During mobilization (approximately 2 weeks) and demobilization (approximately 2 weeks), heavy equipment would be transported to/from the dam construction sites using a Skycrane helicopter (lift capacity of approximately 11,000 pounds [lbs.]).
- During the construction season (approximately 18 weeks), equipment and material would be transported to/from the dam construction sites, as needed, using sling loads attached to either A-Star helicopter (lift capacity of approximately 2,500 lbs.), or modified Black Hawk helicopters (lift capacity of approximately 6,000 lbs.). In addition, construction debris would be transported from the construction areas using sling loads attached to a helicopter to the Base of Operations for stockpiling prior to transport to an approved disposal site.

Refer to Map 9.2.15-1 which depicts the location of the anticipated northern and southern helicopter flight tracks, Base of Operations, and truck hauling route.

Construction equipment use, truck hauling, and helicopter use would cause temporary increases to ambient noise levels during construction activities. Construction-related noise effects are summarized below and are discussed in terms of exposure during both single-event (e.g., the $L_{max}$ and SEL from a single helicopter flight) and multiple events during a period of construction activity ($L_{eq24hr}$ for a full day of helicopter flights or $L_{eq1hr}$ for construction equipment operation). Refer to the LAND 2 – TSR (SCE 2024) for more detailed explanation of how noise effects were determined.

Map 9.2.15-1 illustrates those locations that would be exposed to an $L_{max}$ (the greatest sound level measured during a single noise event) of 60 decibels (dB) or greater due to Project-generated noise from either construction equipment, truck hauling, or a helicopter. For context, an $L_{max}$ of 60 dB corresponds to the noise level from a conversation experienced three to six feet away (FHWA 2006). As illustrated by the map, only locations directly adjacent to the Base of Operations would be exposed to noise from construction equipment at an $L_{max}$ of 60 dB or higher, and only locations directly adjacent to SR-158 would be exposed to noise from passing trucks at an $L_{max}$ of 60 dB or higher. Comparatively, a large area would be temporarily exposed to noise an $L_{max}$ of 60 dB or higher associated with helicopter flights. The following sub-sections provide more detail on the noise exposure associated with each of the three types of construction noise: construction equipment, truck use, and helicopters.

**Construction Equipment**

As depicted in Map 9.2.15-1, the orange shaded region reflects areas that would be temporarily exposed to elevated construction equipment noise at some point during the construction season of 60 dB $L_{max}$ or greater. All areas exposed to 60 dB $L_{max}$ or greater would be within 500 feet of the Base of Operations. Construction equipment would often operate further inside the boundary, which would generate a smaller 60 dB $L_{max}$ contour than is depicted on Map 9.2.15-1.

There are no residential structures located within 1,000 feet of the June Mountain Ski Area Parking Lot and therefore residents would not be affected by construction equipment operating at that location.

**Truck Use**

As depicted in Map 9.2.15-1, the pink shaded region reflects areas that would be temporarily exposed to truck noise during portions of the construction season at 60 dB $L_{max}$ or greater. The 60 dB $L_{max}$ exposure would extend up to 300 feet on either side of SR-158, which would reach some residences in the vicinity of Rush Creek Powerhouse and the developed recreational facilities along Silver Lake, Grant Lake, and Rush Creek.

As presented in Table 9.2.15-3, the $L_{max}$ from a single dump truck would be approximately 77 dB at TR-1, 72 dB at TR-2, and 67 dB at TR-3 due to increasing distance from SR-158. Project facility modifications would require truck hauling during multiple months of the construction season that would create temporary elevated noise levels at these POIs and any noise sensitive areas along SR-158. For comparison, the existing greatest $L_{max}$ varied from 71 to 88 at these locations due to passing vehicle traffic followed by quieter periods with $L_{eq(10min)}$ ranging from 40 to 47 dB. The single-event noise from haul trucks would be similar to the louder existing vehicle traffic events, but the frequency of such events would increase during the construction season.

**Helicopter Flights**

Map 9.2.15-2 illustrates those locations that would experience temporary, single-event helicopter noise at an $L_{max}$ of 60 dB or higher and at an $L_{max}$ of 80 dB or higher. As noted above, an $L_{max}$ of 60 dB corresponds to the noise level from a conversation experienced three to six feet away (FHWA 2006) while an $L_{max}$ of 80 dB corresponds to the noise level from a garbage disposal at 3 feet (Caltrans 2013). As shown, the Skycrane helicopter would generate noise that temporarily affects a larger geographic area than the area that would be affected by noise from the medium duty A-Star helicopter or light duty Black Hawk helicopter. For example, noise exposure in excess of 60 dB $L_{max}$ from Skycrane flights would affect most of the town of June Lake, developed recreational areas along Gull Lake, as well as the southern shore of June Lake. Comparatively, noise exposure in excess of 60 dB $L_{max}$ from Black Hawk and A-Star flights would not extend beyond the northeastern shoreline of Gull Lake. In the central and northern part of the study area the residences along SR-158 and developed recreational facilities near Silver Lake and Rush Creek would experience 60 dB $L_{max}$ or greater from Skycrane flights. However, the 60 dB $L_{max}$ from Black Hawk and A-Star flights would not reach the Silver Lake and Rush Creek recreational areas but would expose most residences along SR-158.

Specific to those locations that would be briefly exposed to noise at 80 dB $L_{max}$ or above, the Skycrane flights would generate 80 dB $L_{max}$ or greater extending approximately 1,500 feet to either side of the proposed flight tracks, reaching most of the residential area near POIs HE-1 and HE-2. The 80 dB $L_{max}$ exposure generated by Black Hawk and A-Star flights would be roughly half that distance of the Skycrane and would not expose any of the analyzed noise sensitive areas or the residential area near HE-1 and HE-2 to 80 dB $L_{max}$.

Table 9.2.15-1 presents a comparison of each proposed helicopter type and the resulting noise levels for both the northern and southern flight tracks. The largest helicopter (Skycrane) would generate the greatest $L_{max}$ of 80 to 88 dB at HE-1 and 78 to 80 dB at HE-2 while traveling along the northern flight track. The Skycrane traveling along the southern flight track would create an $L_{max}$ from 75 to 76 dB at HE-1 and 69 to 70 dB at HE-2. The SEL would be 4 to 7 dB less on the southern flight track when compared with the northern flight track.

During the main construction period, flights would generally be flown by either the smaller Black Hawk or A-Star helicopters. Assuming an average of six flight per day[1] the typical flying day would result in a single-day $L_{eq(24hr)}$ of 42 to 45 dB at HE-1 compared to the existing 33 dB $L_{eq(10min)}$. Similarly, at HE-2 the Black Hawk or A-Star flights would result in $L_{eq(24hr)}$ of 39 to 43 dB compared to the existing $L_{eq(10min)}$ of 43 dB.

Overall, and as shown on Map 9.2.15-2, helicopter flights operating between the Base of Operations and construction work areas at Agnew, Gem, and Rush Meadows dams would result in elevated noise levels in the June Lake Loop area. Residential areas along SR-158 (HE-1, HE-2, PH-4, PH-5, and PH-6) and developed recreation areas at Gull Lake and Silver Lake would be most affected. In addition, backcountry areas along flight tracks would also experience elevated noise levels.

**<u>Summary of Potential Effects</u>**

Table 9.2.15-4 summarizes the estimated greatest construction-generated noise compared to ambient noise levels at noise sensitive POI. The exposure to noise from construction equipment operation, haul truck traffic, and helicopter use during Project facility modification and restoration activities would represent a temporary and brief increase in noise at noise sensitive areas. To reduce effects from construction-related noise, construction measures would be implemented, including avoiding generating noise during more sensitive periods of the day (helicopter use will be limited to 8:00 a.m. to 4:00 p.m. Monday through Saturday); ensuring that construction equipment utilizes the manufacturer's recommended/provided mufflers and that they are functioning as designed; and, to the extent feasible, reducing the number of days of flights by condensing more trips into workdays while increasing the number of days with no flights. Refer to Appendix 5-B for the full language of each of these measures. Construction measures would reduce the temporary and brief adverse effects from construction-related noise but would not fully mitigate effects.

---

[1] Six flights per day is the expected average number of flights on any one construction day.

### 9.2.15.3 Construction Measures

To reduce the temporary and brief effects from construction-related noise, SCE will implement the noise measures identified above and described in Section 5, Appendix 5-B.

### 9.2.15.4 Unavoidable Adverse Effects

Project facility modifications would result in temporary and brief unavoidable adverse noise effects at noise sensitive areas.

### 9.2.15.5 References

Caltrans (California Department of Transportation). 2013. Technical Noise Supplement to the Traffic Noise Analysis Protocol. September.

DoD (Department of Defense). 2022. Memorandum for Adopting the Advanced Acoustic Model for Assessing Community Exposure to Fixed-wing Aircraft Noise. November 28.

FAA (Federal Aviation Administration). 2020. 1050.1F Desk Reference. Federal Aviation Administration Office of Environment and Energy.

FHWA (Federal Highway Administration). 2006. Roadway Construction Noise Model User's Guide. January.

SCE (Southern California Edison Company). 2024. Draft LAND 2 – Noise Technical Study Report. August. Available in Supporting Document A of the Application for New License.

# TABLES

## Table 9.2.15-1. Helicopter Noise Levels

| Northern Flight Track | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| POI | Skycrane | | | Black Hawk | | | A-Star | | |
| | SEL | $L_{max}$ | $L_{eq(24hr)}$ | SEL | $L_{max}$ | $L_{eq(24hr)}$ | SEL | $L_{max}$ | $L_{eq(24hr)}$ |
| HE-1 | 90-95 | 80–88 | 49-54 | 84-87 | 74–77 | 42-45 | 84-86 | 74-76 | 43-44 |
| HE-2 | 88–91 | 78-80 | 46-49 | 81–85 | 70-75 | 39-43 | 82-83 | 72-73 | 41-42 |
| **Southern Flight Track** | | | | | | | | | |
| POI | Skycrane | | | Black Hawk | | | A-Star | | |
| | SEL | $L_{max}$ | $L_{eq(24hr)}$ | SEL | $L_{max}$ | $L_{eq(24hr)}$ | SEL | $L_{max}$ | $L_{eq(24hr)}$ |
| HE-1 | 87-88 | 75-76 | 42-43 | 80-82 | 67-70 | 35-37 | 80–82 | 68-70 | 35-37 |
| HE-2 | 81-83 | 69–70 | 37-38 | 75–78 | 62-65 | 30-33 | 76-77 | 63–65 | 31-32 |

Notes: Calculated with Advanced Acoustic Model. See LAND 2 – TSR, Table LAND 2-1 for modeling details.
Key:
$L_{eq}$ = Equivalent Sound Level
$L_{max}$ = Maximum Sound Level
POI = Point of Interest
SEL = sound exposure level

## Table 9.2.15-2. Typical Construction Equipment Noise Levels at Various Distances

| Distance From Equipment (feet) | $L_{max}$ | $L_{eq(1hr)}$ |
|---|---|---|
| 50 | 80.7 | 79.6 |
| 100 | 74.7 | 73.6 |
| 250 | 66.7 | 65.6 |
| 500 | 60.7 | 59.6 |
| 1,000 | 54.7 | 53.6 |

Source: RCNM v1.0 using standard input parameters (i.e., usage percentage) for all equipment types associated with the Project operating concurrently as identified in LAND 2 – TSR, Table LAND 2-2.
Key:
$L_{eq}$ = Equivalent Sound Level
$L_{max}$ = Maximum Sound Level

## Table 9.2.15-3. Sound Levels Due to Truck Hauling

| POI | Distance From SR-158 | $L_{max}$ |
|---|---|---|
| TR-1 | 50 feet | 76.5 |
| TR-2 | 80 feet | 72.4 |
| TR-3 | 150 feet | 66.9 |

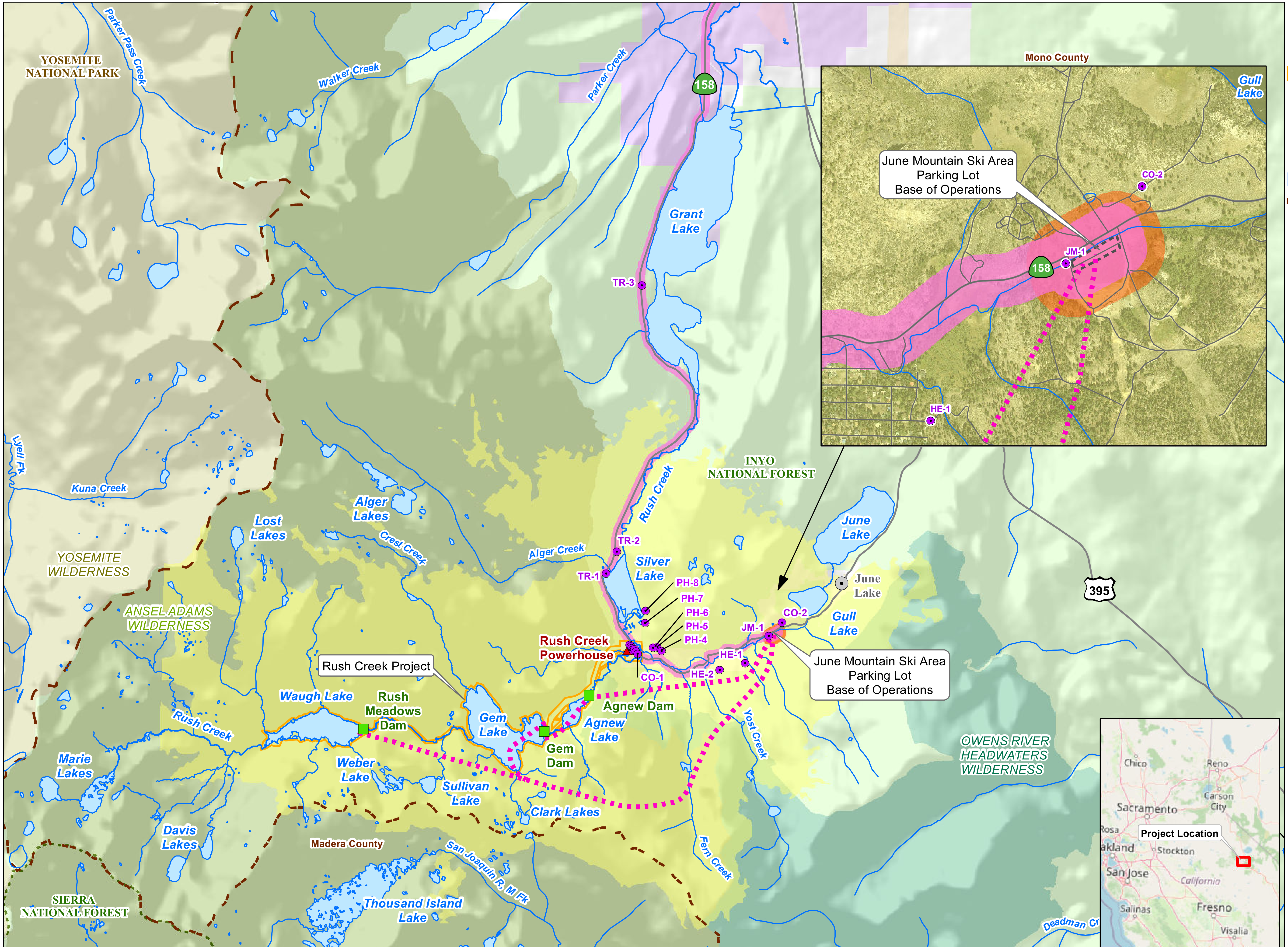
Source: RCNM v1.0 with dump truck source.
Key:
$L_{max}$ = Maximum Sound Level
POI = Point of Interest
SR-158 = State Route 158

## Table 9.2.15-4. Ambient Noise Levels and Project-Induced Noise

| POI | Location | Date of Measurement | Ambient Noise Level (dB Avg $L_{eq(10min)}$) | Estimated Greatest Project-induced Noise Level (dB $L_{max}$) (Primary Noise Source) |
|---|---|---|---|---|
| PH-4 | Southeastern end of Washington St | 24 October | 42 | 75 (Helicopter) |
| PH-5 | Northeastern end of Washington St | 24 October | 41 | 75 (Helicopter) |
| PH-6 | Private driveway off of Nevada St | 24 October | 43 | 76 (Helicopter) |
| PH-7 | Nevada St northeast of powerhouse | 25 October | 54 | 72 (Helicopter) |
| PH-8 | Nevada St farthest northeast of powerhouse | 25 October | 53 | 72 (Helicopter) |
| JM-1 | June Mountain Ski Area Parking Lot | 24 October | 55 | >80 (Helicopter and Construction) |
| CO-1 | Along southern side of SR-158 near the Rush Creek Powerhouse | 25 October | 61 | 77 (Truck Hauling) |
| CO-2 | Gravel road/hiking trail north of June Mountain Ski Area Parking Lot | 25 October | 50 | 79 (Helicopter) |
| HE-1 | Eastern end of Palisades Dr | 24 October | 43 | 88 (Helicopter) |
| HE-2 | Pine Crest Ave | 24 October | 33 | 80 (Helicopter) |
| TR-1 | Western side of Silver Lake at shore | 24 October | 47 | 77 (Truck Hauling) |
| TR-2 | Silver Lake Campground, eastern side of SR-158 | 24 October | 42 | 72 (Truck Hauling) |
| TR-3 | Grant Lake Campground | 24 October | 44 | 67 (Truck Hauling) |

Key:
Avg = average
dB = decibel
$L_{eq}$ = Equivalent Sound Level
$L_{max}$ = Maximum Sound Level
POI = Point of Interest
SR-158 = State Route 158

# MAPS




**SCE Facilities**

- Dam
- Powerhouse
- FERC Boundary

**Other Features**

- Major City/Town
- Highway/Road
- River/Stream
- Lake
- County Boundary
- Approximate Helicopter Flight Path

**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)
- Local Government
- LADWP
- Bureau of Land Management
- Private (Blank)

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

**LAND-2 Study**

- Noise Measurement Point

**Single-Event 60 dB Lmax Exposure from Construction Noise Sources**

- Helicopter Flights (Skycrane)
- Construction Equipment
- Truck Hauling

SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead℠

Rush Creek Project (FERC 1389)

**Map 9.2.15-1**

**Single-Event 60 dB Lmax Exposure From Construction Noise Sources**

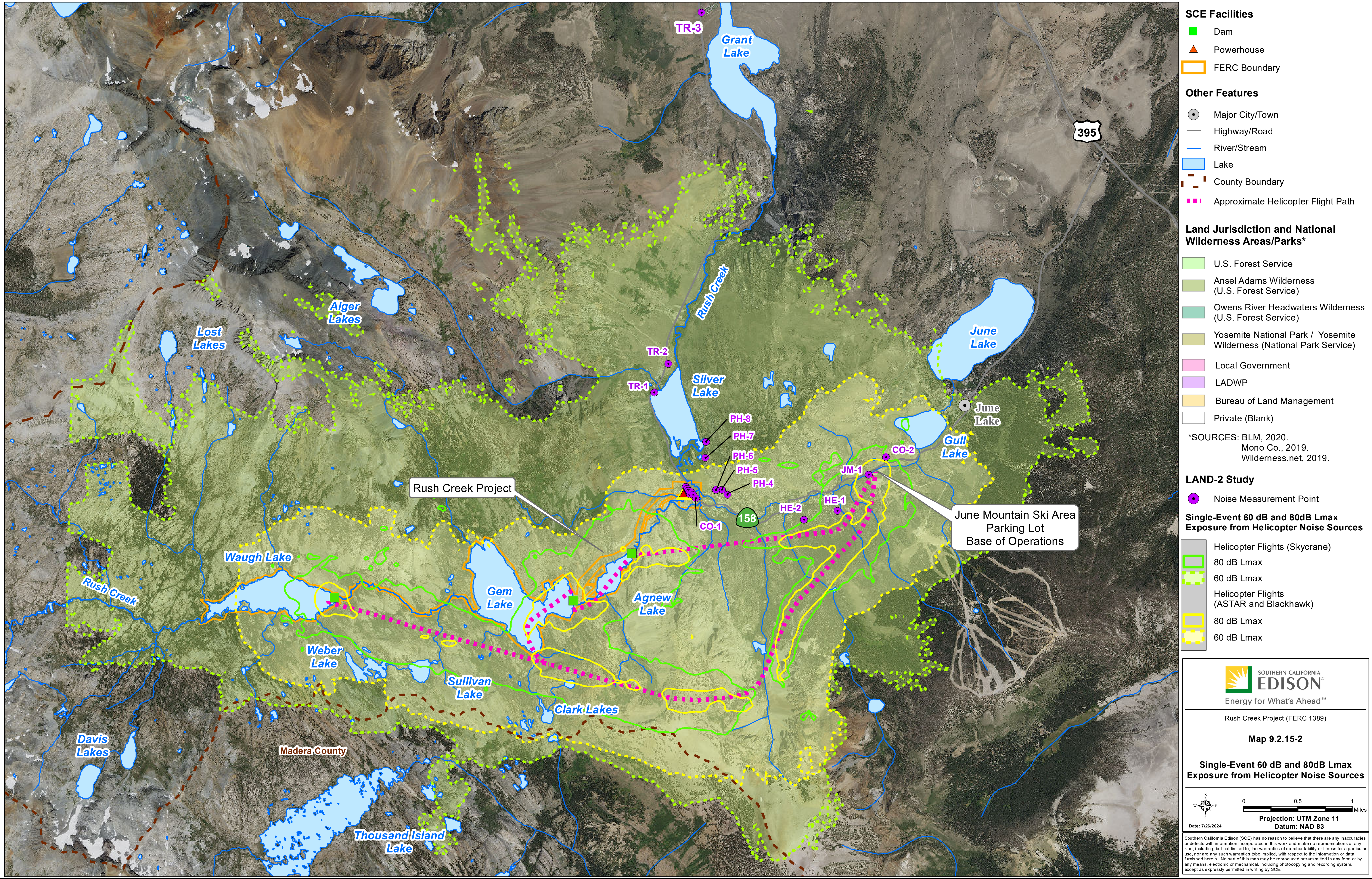
N W E S
0 0.5 1 Miles

Date: 8/1/2024

**Projection: UTM Zone 11**
**Datum: NAD 83**



C:\GIS\237800343\map\Rush Creek\LandMaps\SCE_RUSH_CREEK_SE60LMaxExp_HeliSkycrane_17i11i_01.mxd






C:\GIS\237800343\map\Rush Creek\LandMaps\SCE_RUSH_CREEK_SE60L_80LMaxExp_HeliAll_17i11i_01.mxd

## TABLE OF CONTENTS

Page

9.2.16 Traffic – Construction Effects ..... 9.2.16-1
9.2.16.1 Increased Traffic Resulting from Truck Trips During Construction ..... 9.2.16-1
9.2.16.2 Increased Traffic Resulting from Worker Transportation during Construction ..... 9.2.16-2
9.2.16.3 Increased Road Damage Resulting from Construction Truck Trips ..... 9.2.16-3
9.2.16.4 Construction Measures ..... 9.2.16-3
9.2.16.5 Unavoidable Adverse Effects ..... 9.2.16-3
9.2.16.6 References ..... 9.2.16-3

## LIST OF ACRONYMS

| | |
|---|---|
| Caltrans | California Department of Transportation |
| Forest Service | United States Forest Service |
| Project | Rush Creek Project |
| SCE | Southern California Edison Company |
| SR-158 | State Route 158 |
| SUP | Special Use Permit |
| US-395 | United States Route 395 |

### 9.2.16 Traffic – Construction Effects

This section describes the potential construction-related effects to traffic that could occur because of Project facility modifications to be implemented under the Proposed Action for Southern California Edison Company's (SCE) Rush Creek Project (Project). A description of Project facility modifications, including restoration activities, to be implemented under the Proposed Action is included in Section 5 and Appendix 5-A.

Potential effects are determined by analyzing the changes in traffic that may result from activities to be implemented under the Proposed Action compared to the No-Action Alternative (existing condition) (Section 4). Final effects determinations consider construction measures included to avoid or mitigate impacts associated with construction activities (refer to Section 5, Appendix 5-B). Unavoidable adverse effects are discussed at the end of this section.

The following potential effects to traffic associated with Project facility modifications were evaluated:

- Increased traffic resulting from truck trips during construction.
- Increased traffic resulting from worker transportation during construction.
- Increased road damage resulting from construction truck trips.

#### 9.2.16.1 Increased Traffic Resulting from Truck Trips During Construction

Pending issuance of a Special Use Permit (SUP) from the United States Forest Service (Forest Service), the base of operations for all projects would be established at the June Mountain Ski Area Parking Lot (Base of Operations). The Base of Operations would include a medical kiosk, work area, staging area, stockpile area, sanitation facility, management facilities, a helicopter landing site, and designated general parking area. Each construction season would extend from approximately June 1 to October 31, depending on weather and snow conditions. At the end of each construction season, the Base of Operations would be winterized such that all construction equipment and materials would be removed from the site. The Base of Operations would be restored to conditions that allow for winter ski operations consistent with the requirements of the Forest Service SUP. Refer to Appendix 5-A, Table A-1 for a preliminary list of construction equipment that would be located at the Base of Operations.

The Base of Operations is located directly off State Route 158 (SR-158). SR-158 intersects United States Route 395 (US-395), the primary travel route into the region. During construction activities, SR-158 would experience additional vehicle traffic from heavy trucks headed northbound and southbound on the highway traveling to and from the Base of Operations at the June Mountain Ski Area Parking Lot. The greatest volume of Project-created truck traffic is associated with the retrofit of Gem Dam – when as many as 24 truck roundtrips per day may pass along SR-158 between the June Mountain Ski

Area Parking Lot and the northern junction of SR-158 with US-395. This would occur between June 1 and October 31 (construction season) for three years.

Based on the most recently available northbound and southbound vehicle count data from the California Department of Transportation (Caltrans) (Caltrans 2022) from three postmile locations along SR-158 (North Shore Drive, Silver Lake Campground, and Grant Lake Junction/ northern SR-158/US-395 junction) an average of 1,147 vehicles travels southbound on SR-158 each day when the road is open (summer season), and an average of 975 vehicles travel northbound.[1] Therefore, the addition of as many of 24 truck roundtrips per day (as many as 48 individual truck trips), would only represent a small increase (approximately 2 percent increase southbound and 2.5 percent increase northbound). The overall volume of truck trips associated with removal of Rush Meadows Dam and Agnew Dam is less – a maximum of about 10 truck roundtrips per day associated with facility modifications at Rush Meadows Dam (one construction season) and about three truck roundtrips per day associated with facility modifications at Agnew Dam (one construction season). While there would be a slight increase in truck trips during implementation of Project facility modifications, these trips would not noticeably increase traffic along the highway. Effects on traffic resulting from increased truck trips during construction is considered negligible and would be further reduced with implementation of a Traffic Management Plan (refer to Appendix 5-B).

#### 9.2.16.2 Increased Traffic Resulting from Worker Transportation during Construction

The addition of the temporary workforce, consisting of up to 18 seasonal workers on any one construction workday, is not anticipated to have an impact on local traffic. For construction activities at Rush Meadows Dam and Gem Dam, workers would be housed, and kitchen facilities provided, onsite in the backcountry. As a result, the frequency of intermittent worker vehicle traffic entering and exiting the powerhouse, the parking lot at the Rush Creek Trailhead, and the Base of Operations would be minimal.

For construction activities at Agnew Dam, workers would be housed in local hotels. Even accounting for the housing of a small number of the workforce in local hotels, the total number of daily worker vehicle trips as a result of Project facility modifications is not anticipated to create any noticeable impacts to traffic. Impacts to traffic resulting from worker transportation during construction is considered negligible and would be further reduced with implementation of a Traffic Management Plan.

[1] The daily average northbound and southbound traffic counts were approximated by calculating the total average of (1) the daily northbound Caltrans Traffic Program Census counts and (2) the daily southbound Caltrans Traffic Program Census counts at each of the three postmile markers along the reach of highway between Northshore Drive (just north of the June Mountain Ski Area Parking Lot along SR-158) and the northern junction of SR-158 with US-395 (also referred to as the Grant Lake Junction).

### 9.2.16.3 Increased Road Damage Resulting from Construction Truck Trips

The increased use of heavy construction vehicles, including haulers and large trucks, may accelerate the wear of roadways, including SR-158. Wear could include potholes, cracks, and uneven surfaces and could lead to repairs being needed sooner than under the No-Action Alternative. Prior to construction, the construction contractor will prepare a Traffic Management Plan. Provisions of the Traffic Management Plan will include requirements to harden heavily used parking area surfaces, and to provide appropriate roadway repair for construction-related impacts to roadways. Additionally, prior to construction, SCE will obtain transportation permits from Caltrans (e.g., oversize/overweight or variance permit) and will comply with all measures outlined in the permits. Therefore, while the use of heavy construction vehicles could potentially increase the wear of and result in road damage, construction measures include requirements to proactively address and remediate damage, and therefore increased road damage resulting from construction truck trips is considered negligible.

### 9.2.16.4 Construction Measures

To avoid or reduce impacts to traffic during construction, SCE will implement the following measures. A complete list of construction measures is included in Section 5, Appendix 5-B.

- Prepare a Traffic Management Plan
- Obtain appropriate transportation permits from Caltrans
- Implement roadway repairs following each construction season
- Limit the size of parking and staging areas

### 9.2.16.5 Unavoidable Adverse Effects

There are no unavoidable adverse effects to traffic as a result of Project facility modifications to be implemented under the Proposed Action.

### 9.2.16.6 References

Caltrans (California Department of Transportation). 2022. Traffic Census Program. Available online at: https://dot.ca.gov/programs/traffic-operations/census. Accessed April 2024.

## TABLE OF CONTENTS

Page

9.3 Continued Operation and Maintenance Effects ............ 9.3.1-1

9.3.1 Water Use and Hydrology – Operation and Maintenance Effects ............ 9.3.1-1

9.3.1.1 Changes in Hydrology Affecting Lake Storage ............ 9.3.1-1

9.3.1.2 Changes in Hydrology Affecting Minimum Instream Flows ............ 9.3.1-3

9.3.1.3 Changes in Hydrology Affecting High Flows ............ 9.3.1-4

9.3.1.4 Changes to Recreation Reservoir Elevations in Gem Lake ............ 9.3.1-5

9.3.1.5 Removal of Ramping Rates ............ 9.3.1-6

9.3.1.6 Changes in Power Generation ............ 9.3.1-6

9.3.1.7 Removal of Reservoir Gaging Stations ............ 9.3.1-7

9.3.1.8 Changes in Basin Plan Beneficial Uses ............ 9.3.1-7

9.3.1.9 Environmental Measures ............ 9.3.1-8

9.3.1.10 Unavoidable Adverse Effects ............ 9.3.1-8

9.3.1.11 Reference ............ 9.3.1-8

## LIST OF TABLES

Table 9.3.1-1 Modeled Combined Flows in Rush Creek and South Rush Creek Above SR-158 (days above 300 cfs and 400 cfs) and Rush Creek Above Silver Lake (days above 500 cfs and 600 cfs) ............ 9.3.1-10

Table 9.3.1-2. Monthly Average Modeled Rush Creek Power Generation Flows ............ 9.3.1-12

## LIST OF FIGURES

Figure 9.3.1-1. Waugh Lake Storage Proposed Action vs. No-Action Alternative (WY 1990-2006) ............ 9.3.1-14

Figure 9.3.1-2. Waugh Lake Storage Proposed Action vs. No-Action Alternative (WY 2007-2022) ............ 9.3.1-15

Figure 9.3.1-3. Gem Lake Monthly Storage Exceedance Plots (May-August, WY 1990-2022) ............ 9.3.1-16

Figure 9.3.1-4. Exceedance Plot of Annual Flow Events (1990-2021) Used in the Flood Frequency Analysis for Each Scenario (Unimpaired, historical, Proposed Action [Project], and Existing [No-Action Alternative]), at Rush Creek above SR-158 ... 9.3.1-17

Figure 9.3.1-5. Comparison of 25-Year Annual Recurrence Flow Events for Each of the Scenarios (Unimpaired, Historical, Proposed Action [Project], and Existing [No-Action Alternative]) for Different Locations Along Rush Creek (See Labels) ... 9.3.1-17

Figure 9.3.1-6. Rush Creek Power Generation Flows Proposed Action vs. No-Action Alternative (WY 1990-2006) ... 9.3.1-18

Figure 9.3.1-7. Rush Creek Power Generation Flows Proposed Action vs. No-Action Alternative (WY 2007-2022) ... 9.3.1-19

Figure 9.3.1-8. Rush Creek Power Generation Flow Monthly Exceedance Plots (January-April, WY 1990-2022) ... 9.3.1-20

Figure 9.3.1-9. Rush Creek Power Generation Flow Monthly Exceedance Plots (May-August, WY 1990-2022) ... 9.3.1-21

Figure 9.3.1-10. Rush Creek Power Generation Flow Monthly Exceedance Plots (September-December, WY 1990-2022) ... 9.3.1-22

## LIST OF ACRONYMS

| | |
|---|---|
| ac-ft | acre-feet |
| Basin Plan | Water Quality Control Plan for the Lahontan Region, North and South Basins |
| cfs | cubic feet per second |
| FERC | Federal Energy Regulatory Commission |
| Forest Service | United States Forest Service |
| PMF | probable maximum flood |
| Project | Rush Creek Project |
| SCE | Southern California Edison Company |
| USGS | United States Geological Survey |
| WY | Water Year |

## 9.3 CONTINUED OPERATION AND MAINTENANCE EFFECTS

### 9.3.1 Water Use and Hydrology – Operation and Maintenance Effects

This section describes the potential effects to water use and hydrology that could occur because of continued operation and maintenance activities implemented under the Proposed Action for Southern California Edison Company's (SCE) Rush Creek Project (Project). A description of the Proposed Action operation and maintenance activities is included in Section 5.

Potential effects are determined by analyzing the changes in water use and hydrology that may result from activities implemented under the Proposed Action compared to the No-Action Alternative (existing condition) (Section 4). Final effects determinations consider environmental measures, management, and monitoring plans (environmental measures) to be included under the Proposed Action (refer to Section 5, Appendix 5-C). Unavoidable adverse effects are discussed at the end of this section.

This water use and hydrology effects evaluation includes potential Project operational and maintenance effects related to following:

- Changes in hydrology affecting lake storage
- Changes in hydrology affecting minimum instream flows
- Changes in hydrology affecting high flows
- Changes to recreation reservoir elevations in Gem Lake
- Removal of ramping rates
- Changes in power generation
- Removal of reservoir gaging stations
- Changes in Basin Plan beneficial uses

#### 9.3.1.1 Changes in Hydrology Affecting Lake Storage

Under the Proposed Action Rush Meadows and Agnew dams would be removed and Gem Dam would be retrofitted to facilitate compliance with the seismic restrictions under a probable maximum flood (PMF) event (8,700 cubic feet per second [cfs]) with a new spillway and reduced dam height. Project facility modifications to be implemented under the Proposed Action would result in changes to hydrology affecting lake storage as described below.

### Rush Meadows Dam Removal

Since 2012, as required by the Federal Energy Regulatory Commission (FERC), Waugh Lake has been limited to a maximum water surface elevation of 9,392.1 feet to meet seismic restrictions and alleviate safety concerns. The spillway was notched in 2018 to help facilitate compliance with the FERC-mandated reservoir elevation restrictions. Currently, Waugh Lake is not operated for storage, rather the low-level outlets on Rush Meadows Dam are left open so that inflow passes through the reservoir. During spring high flows, temporary storage occurs in the lake when the inflows exceed the capacity of the low-level outlets and the notched spillway.

Under the Proposed Action, SCE would remove Rush Meadows Dam such that it can pass the PMF (approximately 6,500 cfs) and no longer impound water (dam abutments would remain). SCE would also restore the former lakebed.

Under the Proposed Action, removal of Rush Meadows Dam would eliminate storage at Waugh Lake. The dam, therefore, would no longer temporarily store water when high inflows exceed the low-level outlet capacity as occurs under the No-Action Alternative. A time-series of modeled Waugh Lake storage for the Proposed Action and No-Action Alternatives is shown in Figure 9.3.1-1 and Figure 9.3.1-2. While the limited storage that currently occurs under the No-Action Alternative would be eliminated under the Proposed Action, removal of Rush Meadows Dam would return Waugh Lake to natural unimpaired conditions (meadow and stream) and, therefore, would be beneficial to natural hydrology.

### Agnew Dam Removal

As originally designed, Agnew Dam impounded Agnew Lake, a 40-acre reservoir with a storage capacity of 810 acre-feet (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. In 2017, two rectangular notches were cut in Agnew to allow the reservoir to pass high flows downstream to facilitate compliance with the FERC-mandated reservoir elevation restrictions. Under existing conditions, Agnew Lake no longer stores water or diverts water for power generation. Water entering the lake passes through the two notches in the bottom of the dam and flows into Rush Creek.

Under the Proposed Action, SCE would remove Agnew Dam (dam abutments would remain). SCE would also restore the former lakebed. Agnew Dam, under existing conditions, has been notched to pass all inflows and does not store water; therefore, removal of the dam under the Proposed Action would not change storage at Agnew Lake.

### Gem Dam Retrofit

As originally designed and constructed, 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 and alleviate safety concerns, resulting in a 256-acre reservoir with a storage capacity of 10,752 ac-ft.

Under the Proposed Action, Gem Dam would be retrofitted to facilitate compliance with the seismic restrictions under a PMF event with a new spillway and reduced dam height. In addition, the former inundation zone of Gem Dam, prior to the 2012 seismic restrictions, would be revegetated and stabilized, as necessary. After retrofitting of Gem Dam, the current maximum allowable water surface elevation of the lake, 9,027.5 feet, would remain unchanged.

The removal of Waugh Lake would affect the timing of inflows to Gem Lake. The flow timing changes would minimally affect storage in Gem Lake. Gem storage exceedance plots (by month) for the Proposed Action and No-Action Alternative are provided in Figure 9.3.1-3 (only May–August are shown, other months show no difference). The figure shows that the effect of the Proposed Action on Gem Lake storage is limited to May and June in a small percentage of years; therefore, the Proposed Action would have a negligible effect on Gem Lake storage.

#### 9.3.1.2 Changes in Hydrology Affecting Minimum Instream Flows

The existing Project license includes United States Forest Service (Forest Service) 4(e) Condition No. 5, Minimum Streamflow Requirement, which states:

> During the operation of the facilities authorized by this license, the Licensee shall maintain each year between Waugh and Gem Lakes, a continuous, minimum flow of 10 cubic feet per second (cfs) or the natural flow into Waugh Lake, whichever is less. Said flow shall be measured immediately below Waugh dam (aka “Rush Meadows Dam”). The Licensee shall also maintain each year in those reaches of Rush Creek between Gem Lake and Agnew Lake, and immediately below Agnew Lake dam, a continuous minimum flow of 1 cfs, or natural flows when the level of the either Gem or Agnew Lake falls below the level of the face of each respective dam.

Minimum instream flows under the Proposed Action include a continuous minimum flow requirement of 1 cfs (or natural inflow if the level of Gem Lake falls below the face of the dam) in Rush Creek below Gem Dam (United States Geological Survey [USGS] Gage 10287281; SCE 352 R) and 1 cfs (or natural inflow if the level of Gem Lake falls below the face of the dam) below Agnew Lake (natural lake) at the flume gage (USGS 10287289; SCE 357). Refer to Appendix 5-C for a description of the Minimum Instream Flow Measure.

Under existing conditions, during the low-flow season approximately 10 percent of the water in Rush Creek flows into South Rush Creek at the channel junction just downstream of Horsetail Falls. In the low-flow season, surface flow in South Rush Creek is typically ≤0.1 cfs. Under the Proposed Action, low-flow conditions would remain the same as existing conditions in South Rush Creek.

Following removal of Rush Meadows Dam, natural (unimpaired) hydrology would pass through Rush Creek downstream to Gem Lake. Minimum flow requirements below Gem Dam and at the flume gage below Agnew Lake (natural lake) would maintain the same minimum flows that are provided in the No-Action Alternative, and therefore, there would be no effect on minimum instream flows.

### 9.3.1.3 Changes in Hydrology Affecting High Flows

Peak flow analysis in the AQ 2 – Hydrology Technical Study Report (SCE 2024) indicates that the highest daily average peak flows in the 1990–2021 modeling period of record occur under the unimpaired scenario, followed by the Proposed Action, existing conditions (No-Action Alternative), and historical conditions (pre-seismic reservoir restrictions), in descending order, as a function of the amount of storage that occurs in each scenario (Figure 9.3.1-4). Estimates for the low frequency flood events are 642 cfs (5-year recurrence interval), 793 cfs (10-year recurrence interval), and 997 cfs (25-year recurrence interval). The magnitude of high-flow events varies depending on location (Figure 9.3.1-5). With removal of Rush Meadows Dam (Section 9.3.1.1), there would be an increase in the frequency and magnitude of natural high-flow events in Rush Creek. Under the No-Action Alternative, Waugh Lake temporarily stores water when inflows exceed the capacity of the low-level outlets, which moderates natural peak flows in Rush Creek below Rush Meadows Dam. Under the Proposed Action, flows entering Gem Lake would be unimpaired and higher during peak flow events. Natural high-flow releases and spills from Gem Dam into Rush Creek, therefore, would also be higher and/or more frequent under the Proposed Action.

To evaluate peak flows (daily average), reference flows of 300 and 400 cfs (combined flow in Rush Creek and South Rush Creek upstream of State Route 158 [SR-158]) and 500 and 600 cfs (Rush Creek above Silver Lake) were selected. The reference flows were selected after inspecting 2017 historical data, particularly May through July. The operations model was then used to model the frequency of flows above the reference flows from 1990 through 2021 for the Proposed Action and No-Action Alternative.

Under existing conditions, the amount of water that flows into South Rush Creek at the channel junction just downstream of Horsetail Falls (upstream of SR-158) varies depending on the flow in Rush Creek. At low flows (<286 cfs) the percentage split into South Rush Creek is approximately 10 percent. At higher flows the percentage split is higher. At 300 cfs in Rush Creek, 65 cfs or 22 percent of the flow enters South Rush Creek. At 400 cfs in Rush Creek, 160 cfs or 40 percent of the flow enters South Rush Creek. Under the Proposed Action, high-flow conditions would remain the same as existing conditions in South Rush Creek.

The high-flow events under the Proposed Action, No-Action Alternative, and unimpaired flows are summarized in Table 9.3.1-1 (SCE 2024). For the Proposed Action, the number of days and years with high-flow events (above the reference flows) increases compared to the No-Action Alternative. Under the Proposed Action flow conditions in Rush Creek would be incrementally higher, more similar to the natural hydrograph and unimpaired conditions, and therefore result in a benefit to high-flow hydrology in Rush Creek (including South Rush Creek).

### 9.3.1.4 Changes to Recreation Reservoir Elevations in Gem Lake

The existing Project license includes Forest Service 4(e) Condition No. 8, Recreation and Wilderness Management that requires specific reservoir elevations be maintained, based on season and water year type, to support dispersed recreation at Project reservoirs. Specifically, the current license states the following:

> The Licensee shall maintain the water levels in Waugh and Gem Lakes within 2 feet of the spillway elevations from July 1st to the Tuesday following Labor Day weekend. On low water years (defined as <75% of the April 1st snow water equivalent for the Mono Basin), the water level of Waugh Lake will be maintained to within 3 feet of the spillway elevation and the level of Gem Lake within 6 feet of the spillway elevation during the season specified above. The water level of Agnew Lake will be maintained within 15 feet of the spillway elevation in all water years during the season specified above.

As a result of reservoir elevation restrictions (seismic) imposed by FERC, these reservoir elevation requirements have been superseded under the No-Action Alternative.

Under the Proposed Action, Rush Meadows and Agnew dams would be removed (Section 9.3.1.1) such that they no longer impound water, eliminating the need for recreation reservoir elevations. Gem Dam would be retrofitted and operated at the reduced storage elevation. The reduced storage in Gem Lake and loss of storage at Waugh and Agnew lakes would make it more difficult to manage hydrology in Rush Creek and reservoir elevations in Gem Lake.

Under the No-Action Alternative, Waugh Lake temporarily stores water when inflows exceed the capacity of the low-level outlets, which moderates high flows in Rush Creek below Rush Meadows Dam. Under the Proposed Action, flows entering Gem Lake would be unimpaired and there would be higher peak flow events and lower low flows (particularly in dry years). To provide an available free storage space buffer in Gem Lake to accommodate high flows and low flows and support reservoir-based recreation, reservoir elevation objectives in Gem Lake are specified in the Recreation Reservoir Elevation Objectives Measure (Appendix 5-C). Specifically, following retrofitting of Gem Dam, SCE will make every reasonable effort to achieve the reservoir water surface elevation objectives identified below to support recreation while at the same time meeting the primary operation purposes of the Project (e.g., hydroelectric generation):

| April 1 Snow Water Equivalent Percent at Agnew Pass[1] | Gem Lake Elevation Objectives, Elevation from the Spillway (feet) | Date |
|---|---|---|
| >100% | 5 | August 1 through the Tuesday after Labor Day weekend |
| 75-100% | 5 | July 1 through the Tuesday after Labor Day weekend |
| 40-<75% | 10 | July 1 through the Tuesday after Labor Day weekend |
| <40% | 15 | July 1 through the Tuesday after Labor Day weekend |

[1] Agnew Pass snow water equivalent is located at site AGP – Agnew Pass on the California Data Exchange Center. In the event snow water equivalent data is not available at Agnew Pass, an alternate site such as GEM – Gem Pass may be used.

With implementation of the Recreation Reservoir Elevation Objectives Measure, adequate buffer would be maintained in Gem Lake to accommodate high-flow events and low-flow water years, while still maintaining reservoir levels such that they can support dispersed recreation at Gem Lake. Therefore, effects of the Proposed Action on recreation reservoir elevations are considered negligible.

### 9.3.1.5 Removal of Ramping Rates

The No-Action Alternative includes ramping of flows during the annual drawdown of Project reservoirs (Forest Service 4(e) Condition No. 8).

Under the Proposed Action, Rush Meadows and Agnew dams would be removed (Section 9.3.1.1) and the dams would no longer store water. There would be no annual drawdown or need for ramping flows in Rush Creek below the dams. Gem Dam would be retrofitted to operate at the current reduced seismic restriction level. Gem Lake would continue to store water and be drawn down annually in the fall / winter as is done under the No-Action Alternative. During the annual drawdown of Gem Lake, only the minimum instream flow would be released below the dam. Other flows such as drawdown flows would not be released into Rush Creek below the dam. Ramping of flows during the annual drawdown of Gem Lake is, therefore, not necessary and would be discontinued under the Proposed Action. For the reasons stated above, the removal of ramping rates during the annual draw down of Gem Lake would have no effect on ramping rate hydrology.

### 9.3.1.6 Changes in Power Generation

Under the Proposed Action, Rush Meadows and Agnew dams would be removed and storage for hydroelectric operations would be eliminated. Gem Dam would be retrofitted to facilitate compliance with the seismic restrictions under a PMF event with a new spillway and reduced dam height (Section 9.3.1.1). Under the Proposed Action, hydroelectric operations at Gem Dam and Rush Creek Powerhouse would continue.

Rush Creek power generation flows under the Proposed Action and No-Action Alternative are summarized in Table 9.3.1-2. Time-series of modeled Rush Creek power generation flows for the Proposed Action and No-Action Alternative are shown in Figure 9.3.1-6 and Figure 9.3.1-7. Monthly modeled generation flow exceedance graphs are shown in Figures 9.3.1-8 through 9.3.1-12.

Under the Proposed Action, there would be an increase in power generation flows for the months of April and May and a decrease in flows from June through August. The modeling indicates that power generation flows in other months are not likely to be affected. The overall power generation flow (considering all months) would be reduced by less than 1 percent. Therefore, operations under the Proposed Action would have a negligible effect on power generation compared to the No-Action Alternative.

#### 9.3.1.7 Removal of Reservoir Gaging Stations

Under the Proposed Action, Rush Meadows Dam and Agnew Dam would be removed such that they no longer impound water (Section 9.3.1.1). The following reservoir gages that exist at these locations, under existing conditions, would be removed because they would no longer be necessary for operation and maintenance of the Project.

1. Waugh Lake reservoir storage gage (USGS No. 10287260; SCE No. 359)
2. Agnew Lake reservoir storage gage (USGS No. 10287285; SCE No. 351)

Under the Proposed Action, SCE would maintain the remaining five Project gages that monitor minimum instream flows in Rush Creek, reservoir storage in Gem Lake, and power generation in Rush Creek Powerhouse. Under the Proposed Action, SCE will prepare a Stream and Reservoir Gaging Monitoring Plan (Appendix 5-C) that includes: (1) Project gages used to document minimum instream flows, reservoir levels, and power generation flows; (2) operation and maintenance of the gages; and (3) reporting of compliance. With implementation of the Stream and Reservoir Gaging Monitoring Plan, the Proposed Action includes Project facilities necessary for operation and maintenance of the Project and there would be no effect on gaging stations required to evaluate minimum instream flows, reservoir storage, or power generation.

#### 9.3.1.8 Changes in Basin Plan Beneficial Uses

Beneficial uses that apply to surface waters within the Rush Creek Basin are identified in the Water Quality Control Plan for the Lahontan Region, North and South Basins (Basin Plan) (CRWQCB 2021). Beneficial uses that pertain to upper Rush Creek, above Grant Lake, include: (1) municipal and domestic supply; (2) freshwater replenishment; (3) hydropower generation; (4) water contact recreation; (5) noncontact water recreation; (6) commercial and sport fishing; (7) cold freshwater habitat; (8) wildlife habitat; and (9) spawning, reproduction, and development.

Operation and maintenance activities to be implemented under the Proposed Action would not result in a change in the identified beneficial uses that pertain to upper Rush Creek, above Grant Lake. Specifically, the Project would still store water in Gem Lake, generate hydroelectric power, provide dispersed recreation opportunities, and maintain aquatic and terrestrial wildlife habitat. Therefore, the Proposed Action would maintain beneficial uses in the vicinity of the Project.

#### 9.3.1.9 Environmental Measures

Implementation of operation and maintenance activities under the Proposed Action would have a negligible effect on water use and hydrology with implementation of the following measures (Appendix 5-C):

- Instream Flow Measure
- Recreation Reservoir Elevation Objectives Measure
- Stream and Reservoir Gaging Monitoring Plan

#### 9.3.1.10 Unavoidable Adverse Effects

There are no unavoidable adverse effects to water use and hydrology from continued operation and maintenance of the Project under the Proposed Action.

#### 9.3.1.11 Reference

CRWQCB (California Regional Water Quality Control Board) Lahontan Region. 2021. Water Quality Control Plan for the Lahontan Region, North and South Basins (Basin Plan). Revised September 2021. Available at: https://www.waterboards.ca.gov/lahontan/water_issues/programs/basin_plan/references.html.

SCE (Southern California Edison Company). 2024. AQ 2 – Hydrology Technical Study Report. Provided in Supporting Document A of the Application for New License.

# TABLES

## Table 9.3.1-1. Modeled Combined Flows in Rush Creek and South Rush Creek Above SR-158 (days above 300 cfs and 400 cfs) and Rush Creek Above Silver Lake (days above 500 cfs and 600 cfs)

| Year | Combined Rush Creek and South Rush Creek above SR-158 | | | | | | Rush Creek above Silver Lake | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Days above 300 cfs | | | Days above 400 cfs | | | Days above 500 cfs | | | Days above 600 cfs | | |
| | Proposed Action | No-Action Alternative | Un-impaired | Proposed Action | No-Action Alternative | Un-impaired | Proposed Action | No-Action Alternative | Un-impaired | Proposed Action | No-Action Alternative | Un-impaired |
| 1990 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1991 | 0 | 0 | 12 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1992 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1993 | 10 | 2 | 42 | 1 | 0 | 14 | 3 | 0 | 3 | 0 | 0 | 0 |
| 1994 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1995 | 29 | 31 | 58 | 19 | 14 | 34 | 25 | 26 | 29 | 18 | 14 | 19 |
| 1996 | 4 | 0 | 24 | 1 | 0 | 9 | 3 | 0 | 7 | 0 | 0 | 0 |
| 1997 | 2 | 0 | 20 | 1 | 0 | 7 | 2 | 0 | 3 | 1 | 0 | 2 |
| 1998 | 21 | 27 | 40 | 4 | 2 | 32 | 14 | 12 | 24 | 3 | 0 | 4 |
| 1999 | 3 | 0 | 22 | 1 | 0 | 8 | 2 | 0 | 2 | 1 | 0 | 0 |
| 2000 | 5 | 0 | 24 | 0 | 0 | 11 | 1 | 0 | 3 | 0 | 0 | 0 |
| 2001 | 0 | 0 | 20 | 0 | 0 | 5 | 0 | 0 | 2 | 0 | 0 | 0 |
| 2002 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2003 | 4 | 0 | 24 | 0 | 0 | 13 | 3 | 0 | 9 | 0 | 0 | 5 |
| 2004 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2005 | 17 | 14 | 58 | 4 | 0 | 33 | 10 | 3 | 21 | 1 | 0 | 4 |
| 2006 | 26 | 26 | 60 | 5 | 0 | 37 | 19 | 9 | 24 | 1 | 0 | 1 |
| 2007 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2008 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2009 | 0 | 0 | 16 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2010 | 14 | 8 | 25 | 8 | 1 | 16 | 11 | 5 | 14 | 6 | 0 | 10 |
| 2011 | 26 | 23 | 35 | 14 | 5 | 28 | 23 | 21 | 26 | 8 | 2 | 9 |
| 2012 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2013 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| Year | Combined Rush Creek and South Rush Creek above SR-158 | | | | | | Rush Creek above Silver Lake | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Days above 300 cfs | | | Days above 400 cfs | | | Days above 500 cfs | | | Days above 600 cfs | | |
| | Proposed Action | No-Action Alternative | Un-impaired | Proposed Action | No-Action Alternative | Un-impaired | Proposed Action | No-Action Alternative | Un-impaired | Proposed Action | No-Action Alternative | Un-impaired |
| 2014 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2015 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2016 | 2 | 0 | 7 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2017 | 40 | 40 | 58 | 27 | 25 | 53 | 36 | 33 | 47 | 16 | 18 | 24 |
| 2018 | 2 | 0 | 9 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 |
| 2019 | 10 | 11 | 30 | 5 | 0 | 16 | 9 | 10 | 13 | 6 | 0 | 7 |
| 2020 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2021 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2022 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Total Days** | 215 | 182 | 602 | 91 | 47 | 328 | 162 | 119 | 228 | 62 | 34 | 85 |
| **Total Years** | 16 | 9 | 25 | 13 | 5 | 19 | 15 | 8 | 16 | 11 | 3 | 10 |

Notes:
cfs = cubic feet per second

## Table 9.3.1-2. Monthly Average Modeled Rush Creek Power Generation Flows

| Month | Monthly Average Flow - Power Generation (cfs) | | |
|---|---|---|---|
| | Proposed Action | No-Action Alternative | % of No-Action Alternative |
| January | 20.7 | 21.0 | 99% |
| February | 49.8 | 49.9 | 100% |
| March | 54.0 | 53.9 | 100% |
| April | 69.5 | 68.1 | 102% |
| May | 37.7 | 32.7 | 115% |
| June | 76.4 | 80.7 | 95% |
| July | 62.1 | 64.2 | 97% |
| August | 33.7 | 36.1 | 93% |
| September | 20.8 | 21.0 | 99% |
| October | 18.4 | 18.6 | 99% |
| November | 16.1 | 16.4 | 99% |
| December | 17.7 | 17.6 | 100% |
| All Months | 39.6 | 39.9 | 99% |

Notes:
cfs = cubic feet per second

# FIGURES

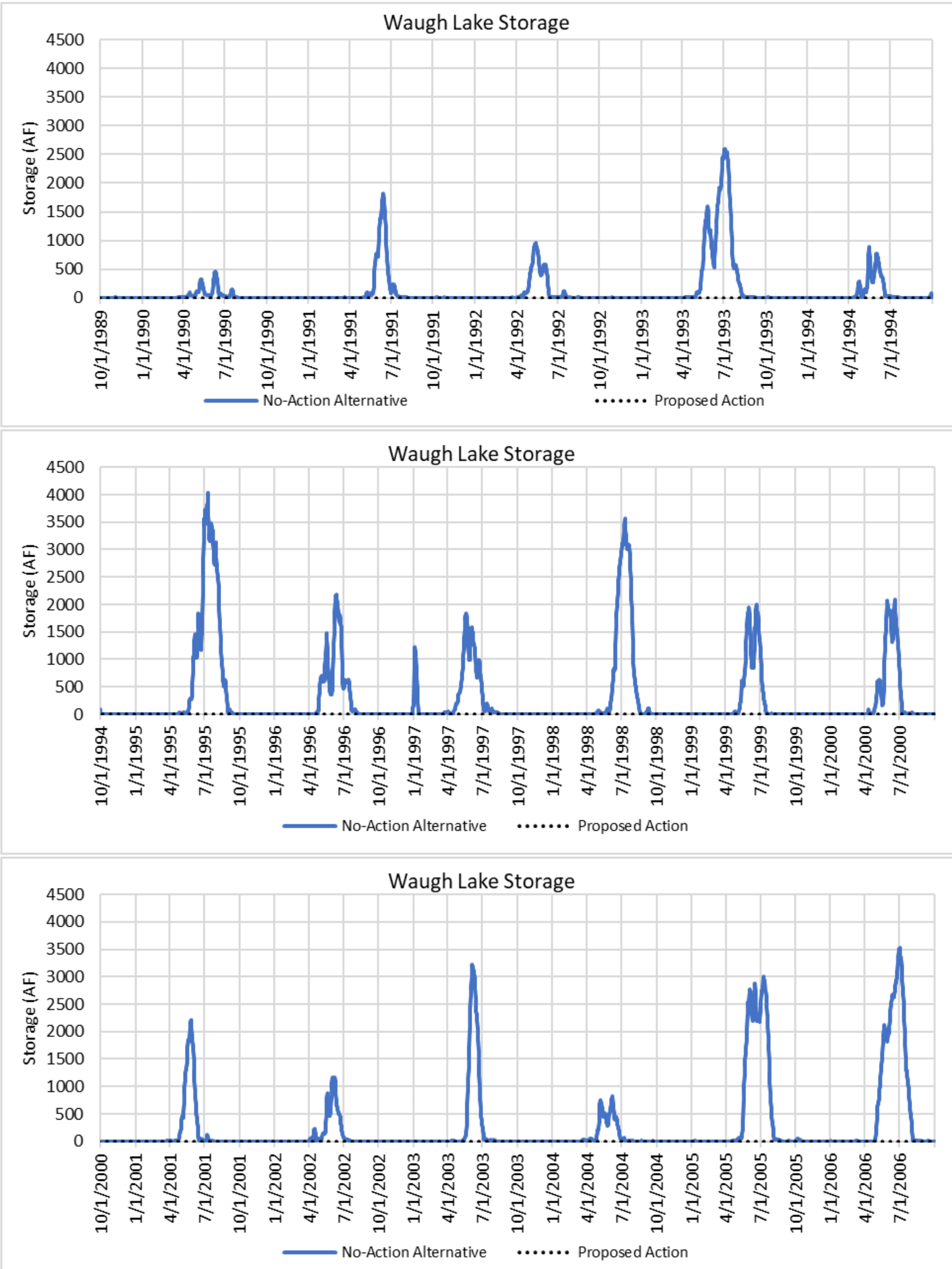



**Figure 9.3.1-1. Waugh Lake Storage Proposed Action vs. No-Action Alternative (WY 1990-2006)**

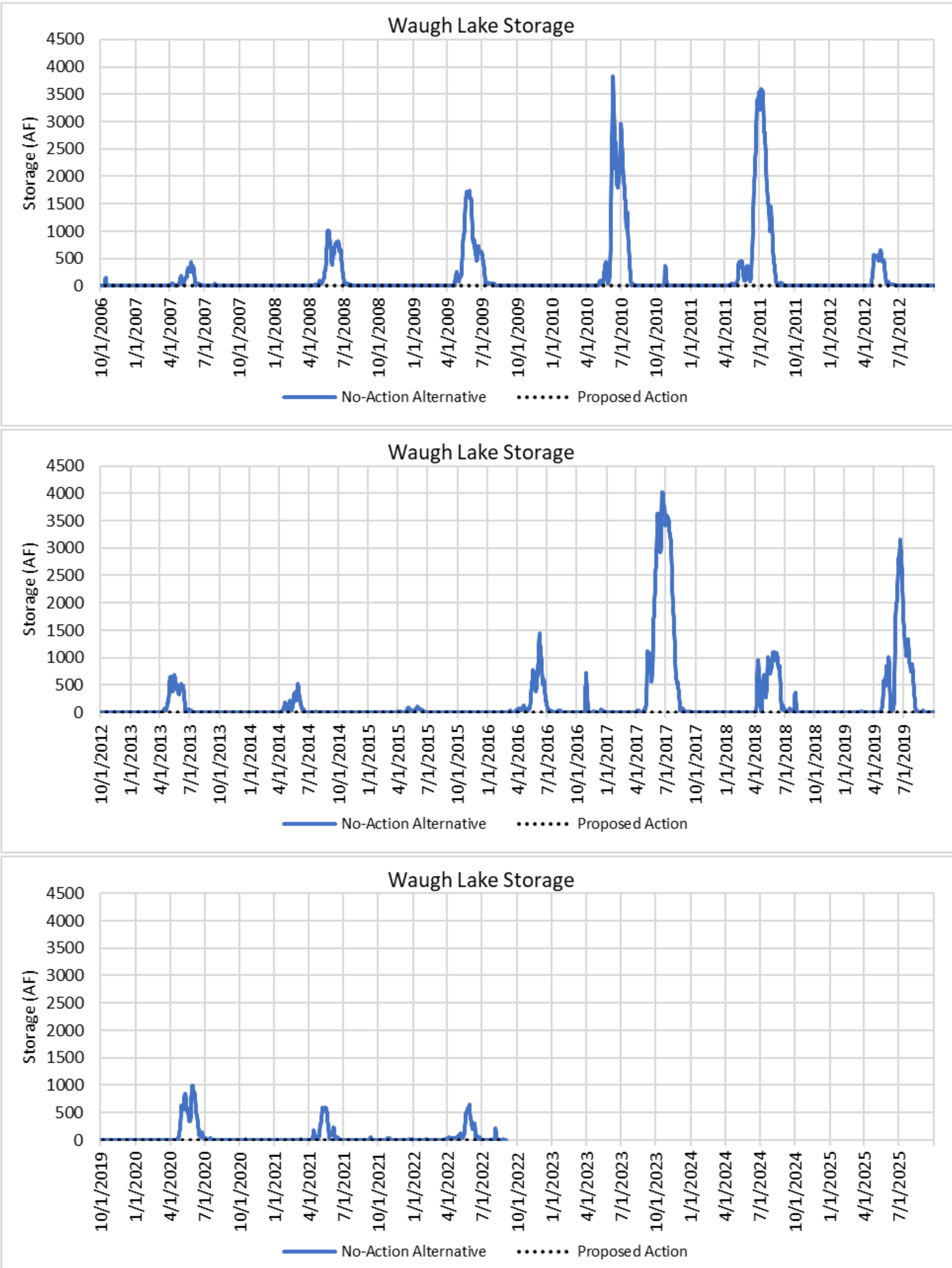



**Figure 9.3.1-2. Waugh Lake Storage Proposed Action vs. No-Action Alternative (WY 2007-2022)**

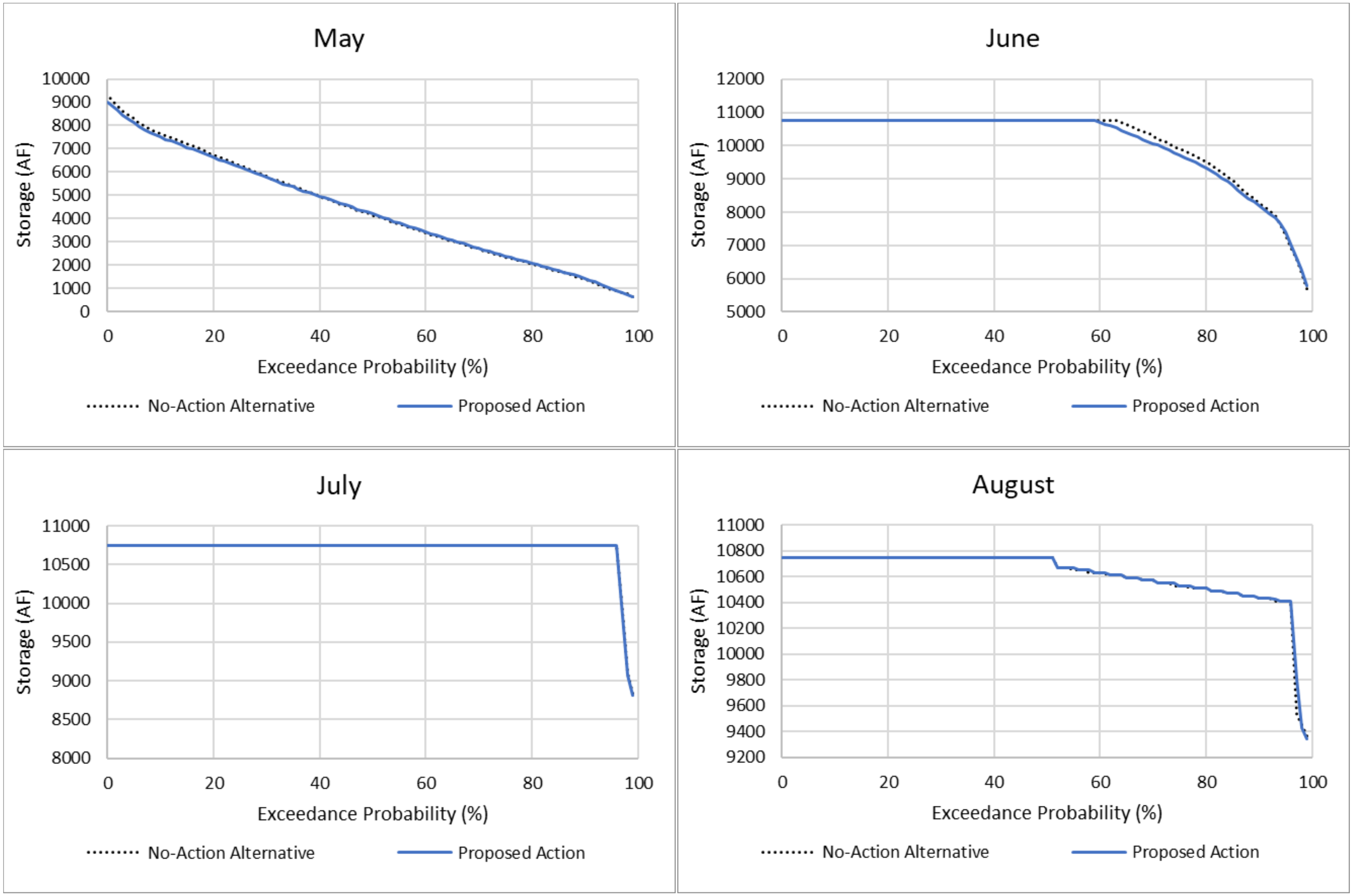



**Figure 9.3.1-3. Gem Lake Monthly Storage Exceedance Plots (May-August, WY 1990-2022)**

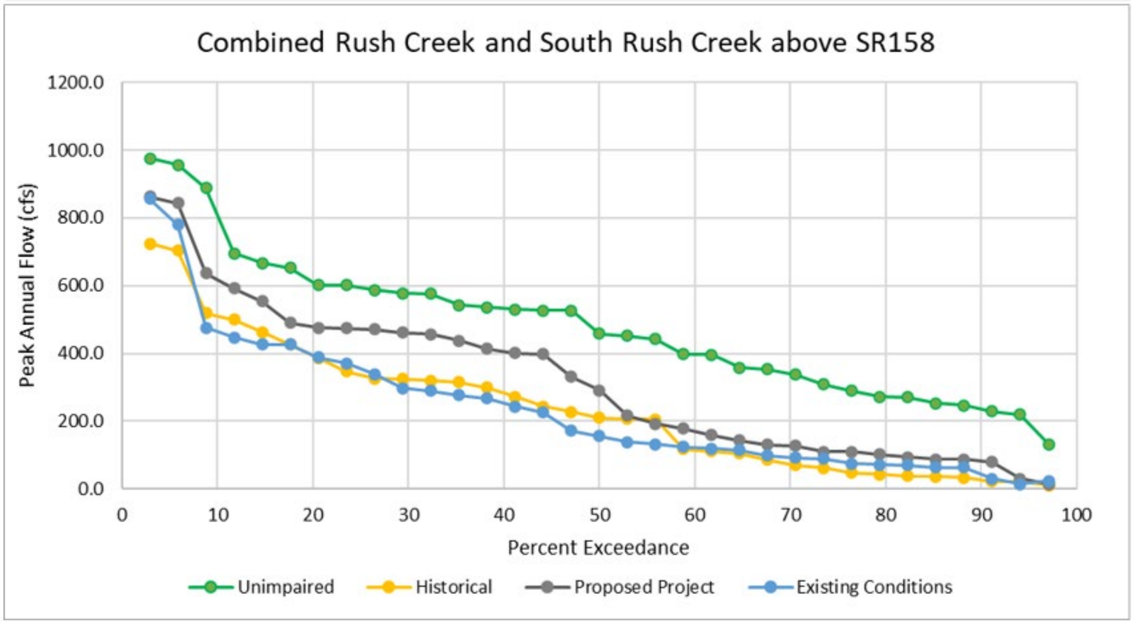



**Figure 9.3.1-4. Exceedance Plot of Annual Flow Events (1990-2021) Used in the Flood Frequency Analysis for Each Scenario (Unimpaired, historical, Proposed Action [Project], and Existing [No-Action Alternative]), at Rush Creek above SR-158**

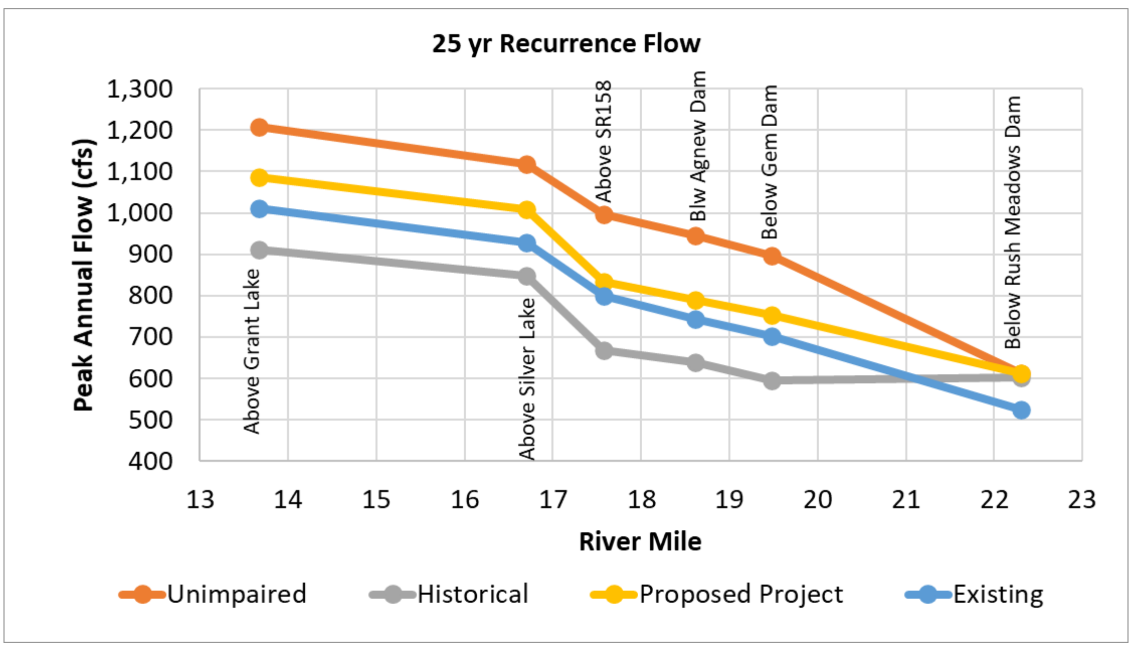



**Figure 9.3.1-5. Comparison of 25-Year Annual Recurrence Flow Events for Each of the Scenarios (Unimpaired, Historical, Proposed Action [Project], and Existing [No-Action Alternative]) for Different Locations Along Rush Creek (See Labels)**

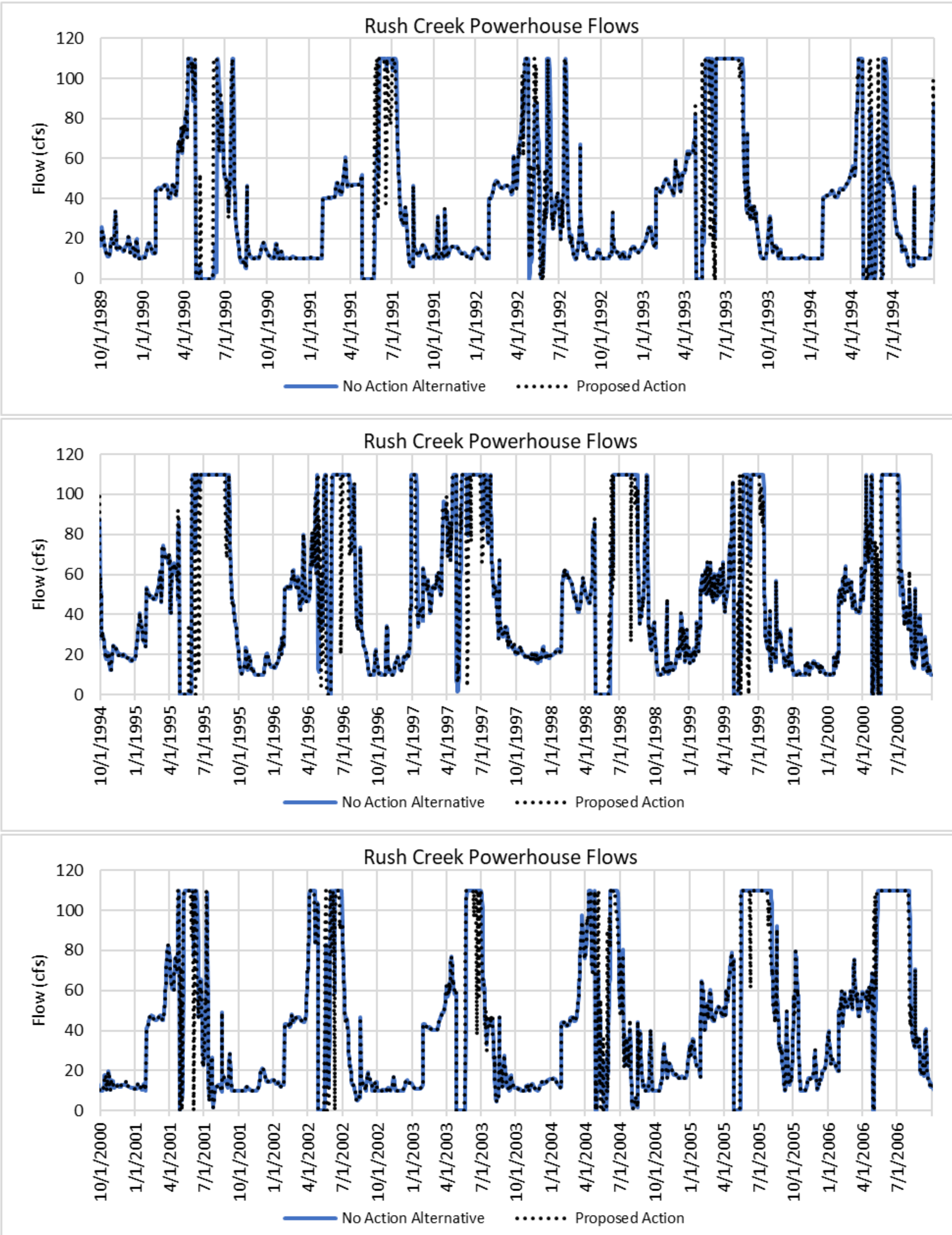



**Figure 9.3.1-6. Rush Creek Power Generation Flows Proposed Action vs. No-Action Alternative (WY 1990-2006)**

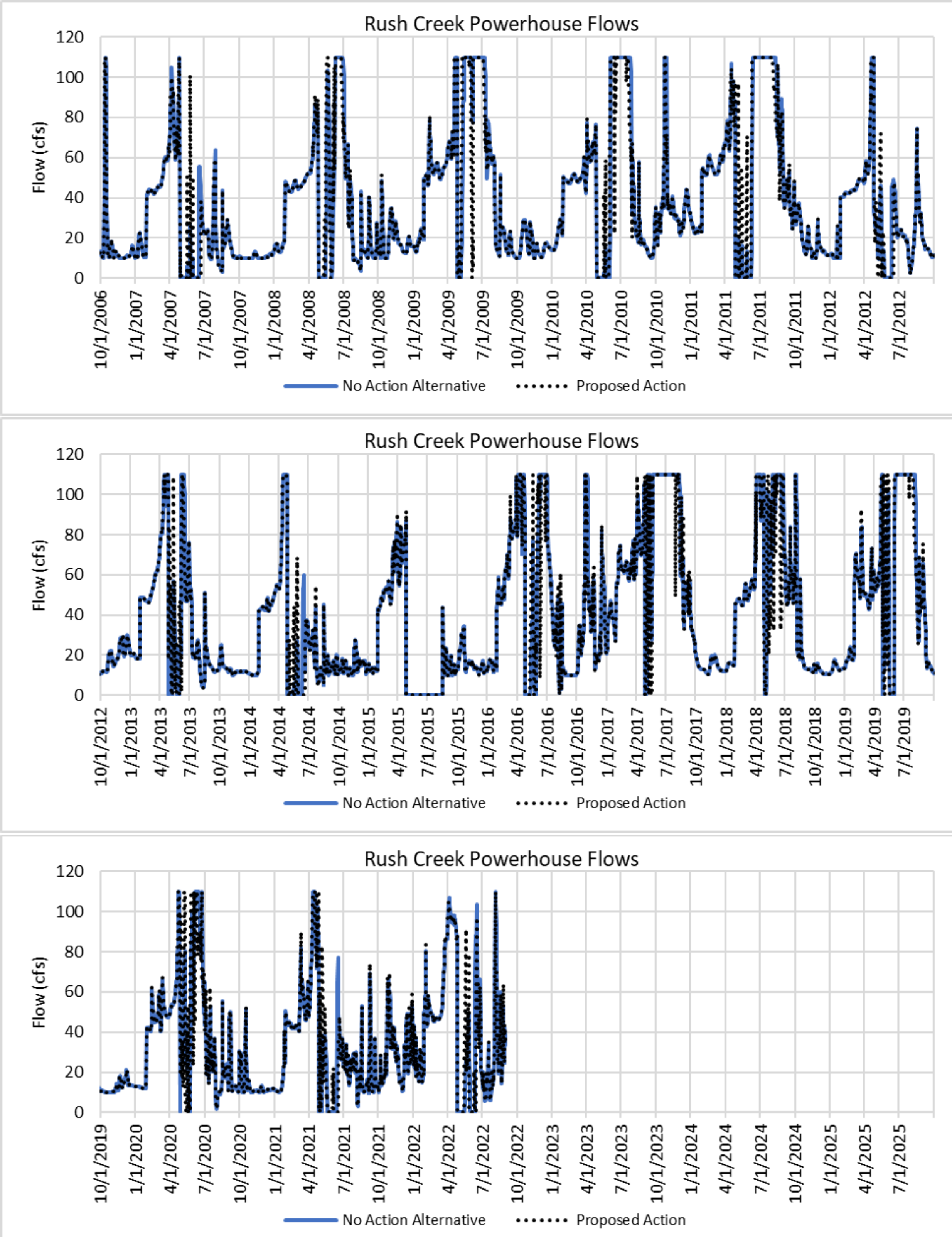



**Figure 9.3.1-7. Rush Creek Power Generation Flows Proposed Action vs. No-Action Alternative (WY 2007-2022)**

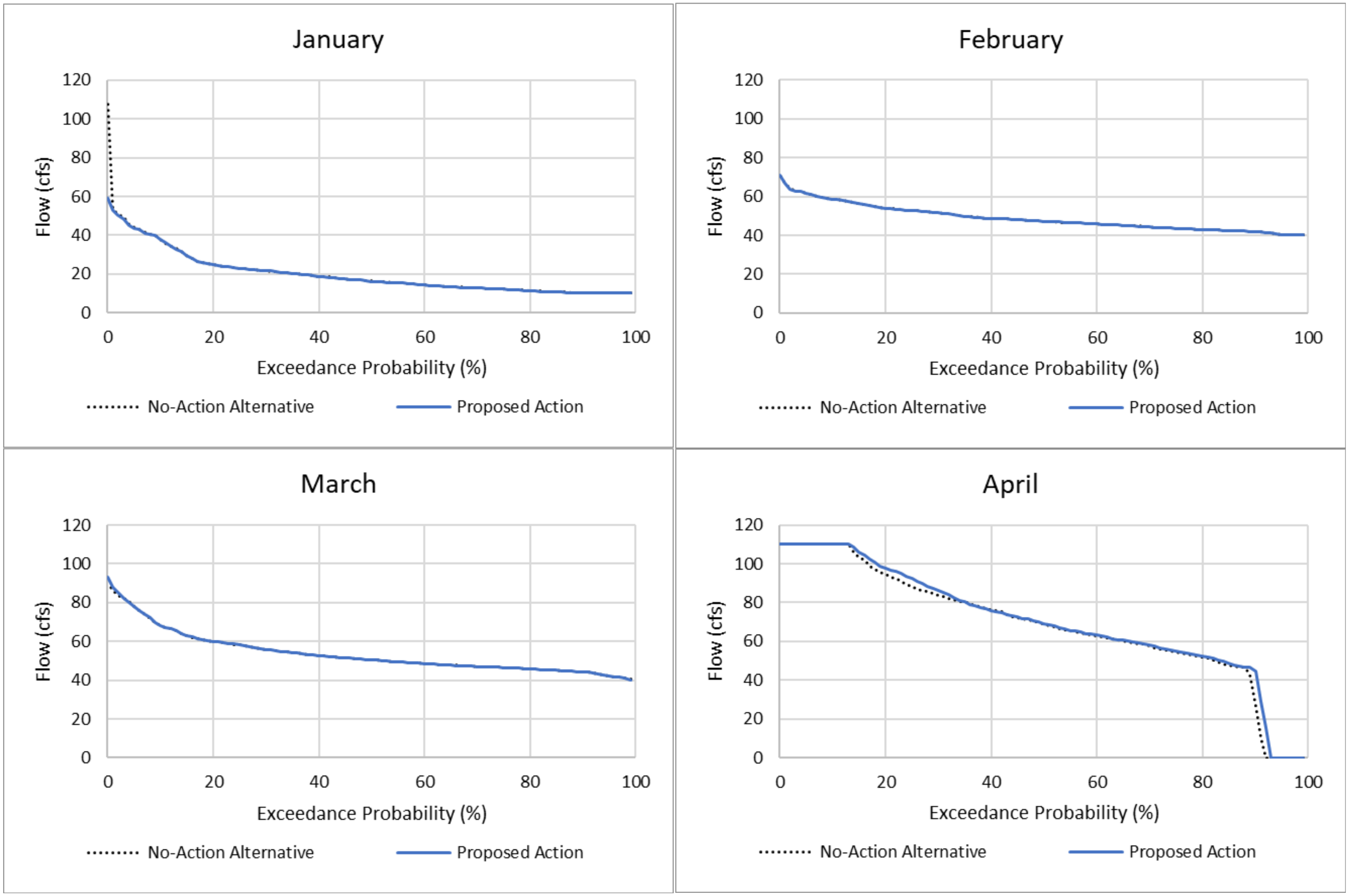



**Figure 9.3.1-8. Rush Creek Power Generation Flow Monthly Exceedance Plots (January-April, WY 1990-2022)**

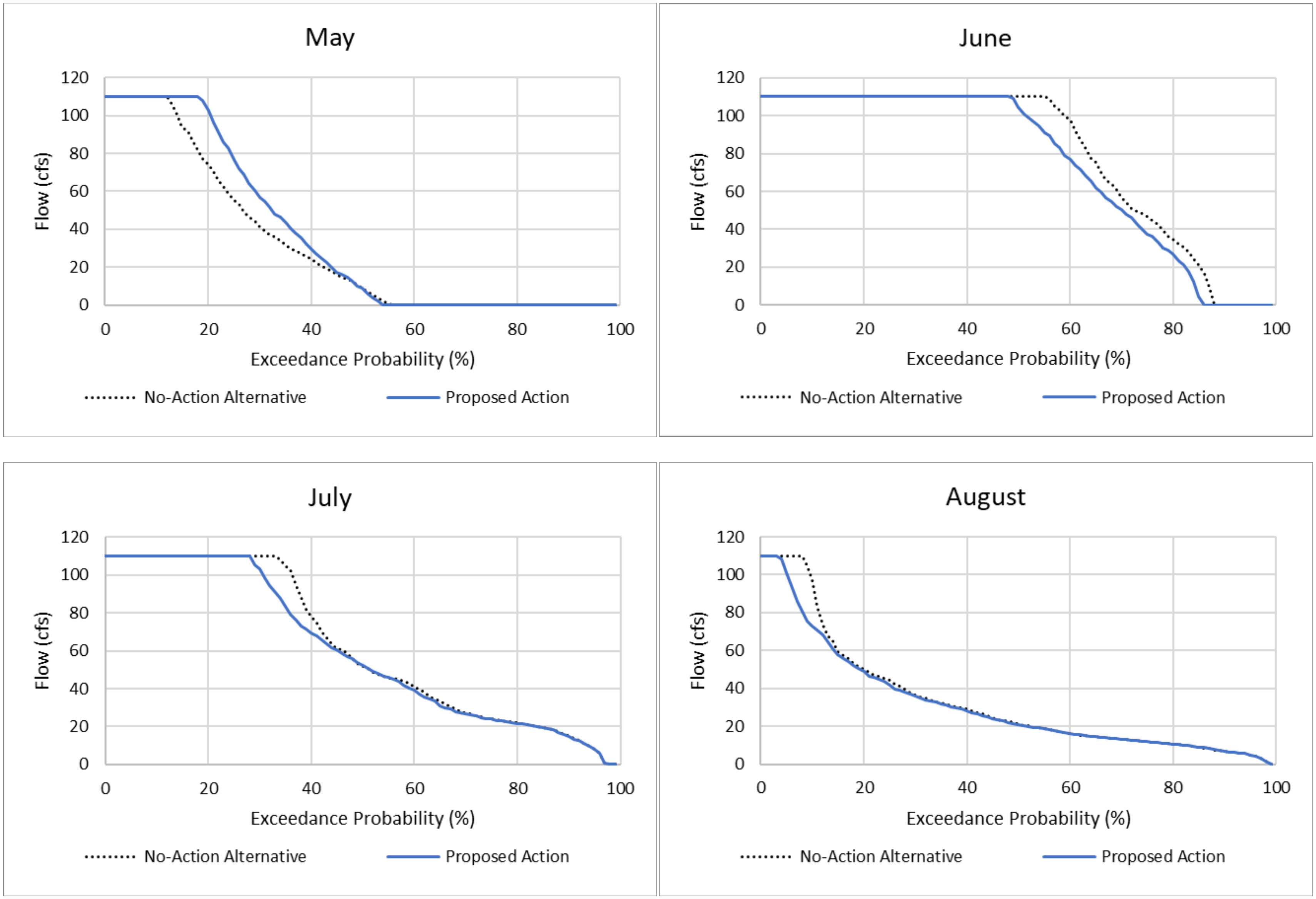



**Figure 9.3.1-9. Rush Creek Power Generation Flow Monthly Exceedance Plots (May-August, WY 1990-2022)**

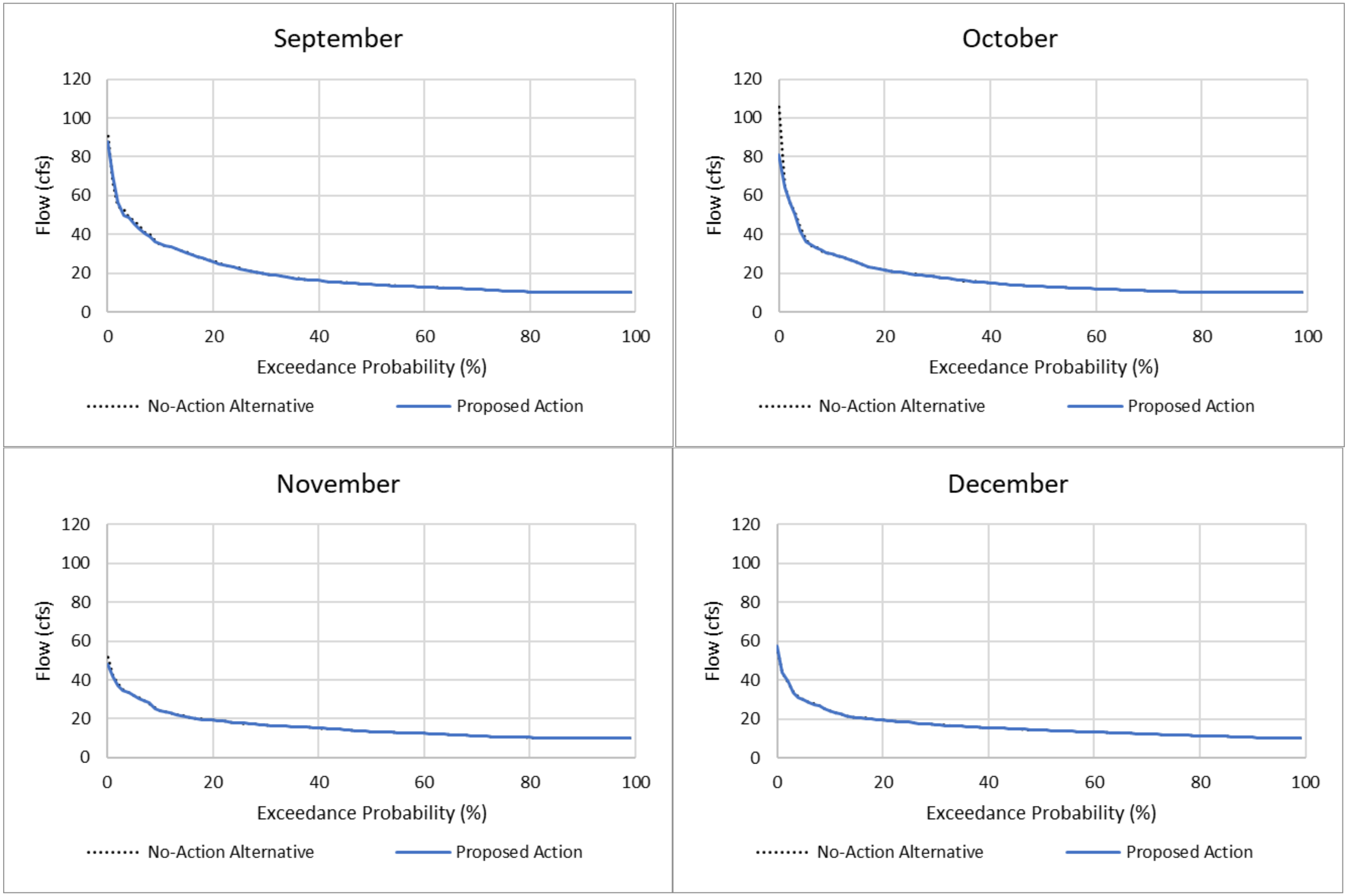



**Figure 9.3.1-10. Rush Creek Power Generation Flow Monthly Exceedance Plots (September-December, WY 1990-2022)**

## TABLE OF CONTENTS

Page

9.3.2 Water Quality – Operation and Maintenance Effects ........ 9.3.2-1
9.3.2.1 Potential Changes to Water Quality Resulting from Changes in Project Operations ........ 9.3.2-1
9.3.2.2 Potential Effects of Sediment Transport and Erosion on Water Quality Resulting from Dam Removal and Retrofitting of Project Dams ........ 9.3.2-3
9.3.2.3 Potential Changes to Water Quality Resulting from Herbicide use During Vegetation Management Activities ........ 9.3.2-5
9.3.2.4 Environmental Measures ........ 9.3.2-6
9.3.2.5 Unavoidable Adverse Effects ........ 9.3.2-6
9.3.2.6 References ........ 9.3.2-6

## LIST OF ACRONYMS

| | |
|---|---|
| cfs | cubic feet per second |
| FERC | Federal Energy Regulatory Commission |
| Forest Service | United States Forest Service |
| PMF | probable maximum flood |
| Project | Rush Creek Project |
| SCE | Southern California Edison Company |
| TSS | total suspended solids |
| USGS | United States Geological Survey |

### 9.3.2 Water Quality – Operation and Maintenance Effects

This section describes the potential effects to water quality that could occur because of continued operation and maintenance activities to be implemented under the Proposed Action for Southern California Edison Company's (SCE) Rush Creek Project (Project). A description of operation and maintenance activities to be implemented under the Proposed Action is included in Section 5.

Potential effects are determined by analyzing the changes water quality that may result from activities to be implemented under the Proposed Action compared to the No-Action Alternative (existing condition) (Section 4). Final effects determinations consider environmental measures, management and monitoring plans (environmental measures) to be included under the Proposed Action (refer to Section 5, Appendix 5-C). Unavoidable adverse effects are discussed at the end of this section.

The following potential effects to water quality because of continued operation and maintenance activities were evaluated:

- Potential changes to water quality resulting from changes in Project operations (minimum instream flow and reservoir level requirements).
- Potential effects of sediment transport and erosion on water quality resulting from removal and retrofitting of Project dams.
- Potential changes to water quality resulting from herbicide use during vegetation management activities.

This section relies on data collected as part of water quality studies conducted in 2023 as part of the AQ 4 – Water Quality Technical Study Plan. In accordance with direction from the Federal Energy Regulatory Commission (FERC) in its Determination on Requests for Study Modification (FERC 2024), SCE will repeat the 2023 water quality monitoring program in 2024 to identify any potential changes in water quality compared to the wet water year type observed in 2023. Results from 2024 studies will be provided in an updated technical study report to be included in the Final License Application. In addition, this analysis will be updated, as appropriate, in the Final License Application.

#### 9.3.2.1 Potential Changes to Water Quality Resulting from Changes in Project Operations

Under the Proposed Action Rush Meadows and Agnew dams would be removed and Gem Dam would be retrofitted to facilitate compliance with the seismic restrictions under a probable maximum flood (PMF) event (8,700 cubic feet per second [cfs]) with a new spillway and reduced dam height. As a result of these Project facility modifications, SCE proposes to change minimum instream flow and reservoir elevation requirements currently implemented under the No-Action Alternative. These changes have the potential to affect water quality as described below.

### Existing and Proposed Minimum Instream Flow Requirement

The existing Project license includes United States Forest Service (Forest Service) 4(e) Condition No. 5, Minimum Streamflow Requirement, which states:

> During the operation of the facilities authorized by this license, the Licensee shall maintain each year between Waugh and Gem Lakes, a continuous, minimum flow of 10 cubic feet per second (cfs) or the natural flow into Waugh Lake, whichever is less. Said flow shall be measured immediately below Waugh dam (aka “Rush Meadows Dam”). The Licensee shall also maintain each year in those reaches of Rush Creek between Gem Lake and Agnew Lake, and immediately below Agnew Lake dam, a continuous minimum flow of 1 cfs, or natural flows when the level of the either Gem or Agnew Lake falls below the level of the face of each respective dam.

Minimum instream flows under the Proposed Action include a continuous minimum flow requirement of 1 cfs (or natural inflow if the level of Gem Lake falls below the face of the dam) in Rush Creek below Gem Dam (United States Geological Survey [USGS] Gage 10287281; SCE 352 R) and 1 cfs (or natural inflow if the level of Gem Lake falls below the face of the dam) below Agnew Lake (natural lake) at the flume gage (USGS 10287289; SCE 357). Refer to Appendix 5-C for a description of the Minimum Instream Flow Measure. Following removal of Rush Meadows Dam, natural (unimpaired) hydrology would pass through Rush Creek downstream to Gem Lake.

Existing water quality in the vicinity of the Project is currently high quality (e.g., cold temperatures, high dissolved oxygen, no contaminants) and there were no Project-related water quality issues identified during studies conducted as part of relicensing (SCE 2024a). Minimum flow requirements below Gem Dam and at the flume gage below Agnew Lake (natural lake) would maintain the same minimum flows that are provided in the No-Action Alternative. Continued operation and maintenance of the Project would not change flows in a way that would affect water quality; therefore, there would be no effect.

### Existing Lake Level Requirements

The existing Project license includes Forest Service 4(e) Condition No. 8, Recreation and Wilderness Management that requires specific reservoir elevations be maintained, based on season and water year type, to support dispersed recreation at Project reservoirs. Specifically, the current license states the following:

> The Licensee shall maintain the water levels in Waugh and Gem Lakes within 2 feet of the spillway elevations from July 1st to the Tuesday following Labor Day weekend. On low water years (defined as <75% of the April 1st snow water equivalent for the Mono Basin), the water level of Waugh Lake will be maintained to within 3 feet of the spillway elevation and the level of Gem Lake within 6 feet of the spillway elevation during the season specified above. The water level of Agnew Lake will be maintained within 15 feet of the spillway elevation in all water years during the season specified above.

Under the Proposed Action, Rush Meadows and Agnew dams would be removed such that they no longer impound water, eliminating the need for recreation reservoir elevations in Waugh Lake and Agnew Lake. In addition, under the Proposed Action, recreation reservoir elevation objectives would be implemented at Gem Lake (refer to Appendix 5-C for a description of the Recreation Reservoir Elevation Objectives Measure). Specifically, following retrofitting of Gem Dam, SCE will make every reasonable effort to achieve the reservoir water surface elevation objectives identified below to support recreation while at the same time meeting the primary operation purposes of the Project (e.g., hydroelectric generation):

| April 1 Snow Water Equivalent Percent at Agnew Pass[1] | Gem Lake Elevation Objectives, Elevation from the Spillway (feet) | Date |
|---|---|---|
| >100% | 5 | August 1 through the Tuesday after Labor Day weekend |
| 75-100% | 5 | July 1 through the Tuesday after Labor Day weekend |
| 40-<75% | 10 | July 1 through the Tuesday after Labor Day weekend |
| <40% | 15 | July 1 through the Tuesday after Labor Day weekend |

[1] Agnew Pass snow water equivalent is located at site AGP – Agnew Pass on the California Data Exchange Center. In the event snow water equivalent data is not available at Agnew Pass, an alternate site such as GEM – Gem Pass may be used.

Existing water quality in the vicinity of the Project is currently high quality (e.g., cold temperatures, high dissolved oxygen, no contaminants) and there were no Project-related water quality issues identified during studies conducted as part of relicensing (SCE 2024a). Operational changes (i.e., recreation reservoir elevation objectives) to be implemented under the Proposed Action would not change water surface elevations in a way that would affect water quality; therefore, there would be no effect.

#### 9.3.2.2 Potential Effects of Sediment Transport and Erosion on Water Quality Resulting from Dam Removal and Retrofitting of Project Dams

### Rush Meadows Dam Removal

Following the removal of Rush Meadows Dam to an elevation of approximately 9,378 feet (subject to a final design that reflects refined hydraulic calculations and topographic information), potential impacts associated with sediment release from the Waugh lakebed into Rush Creek could occur and affect water quality. During high-flow events erosion of the lakebed channel or even head cutting of the channel could occur over the term of the new license if the dam removal elevation (channel control elevation) is too low. In addition, erosion of the off-channel portions of the former lakebed during storm events or snow melt could erode/transport sediment into Rush Creek if the lakebed is not revegetated. These events could temporarily increase turbidity and total suspended solids (TSS) during certain seasons (i.e., spring runoff). Sedimentation downstream of Waugh Lake could increase due to erosion from exposed lakebed material when compared to existing conditions.

Removal of Rush Meadows Dam would result in increased natural unimpaired high-flow events in Rush Creek below the dam. The high-flow events were formerly captured by the reservoir. The high-flow events could cause erosion in Rush Creek downstream of the dam and transport sediment stored in the channel into Gem Lake. Abundant bedrock in the channel would preclude downcutting (incision of the channel). Suspended sediment transported downstream could subsequently lead to periods of lower water clarity in Gem Lake during spring runoff.

The Proposed Action includes development of a site-specific restoration plan to minimize the long-term potential for water quality effects from mobilization of reservoir bed and shoreline materials, and potential incision / head cutting of Rush Creek. Objectives of the restoration plan include:

- Revegetation and stabilization of sediment in the former Waugh lakebed.
- Reestablishment and stabilization of Rush Creek within the former Waugh lakebed, as necessary.
- Restoration of the channel, and riparian and wetland vegetation in the former Waugh lakebed.
- A 5-year monitoring period to evaluate success of the initial restoration effort. Additional restoration activities may be needed depending on monitoring results.

Following dam removals, in general, turbidity values have been shown to increase during the removal process, but quickly return to pre-dam removal levels (Wagner 2023). Also, most sediments observed in pools in Rush Creek during relicensing studies were coarse gravels and sands (SCE 2024b). These coarser substrates tend to mobilize and transport more slowly than fine sediments which would likely minimize potential turbidity and TSS level increases.

With implementation of the site-specific restoration plan and removal of Rush Meadows Dam at an elevation that would not cause upstream head cutting, long-term, the Proposed Action effects on physical water quality parameters (turbidity/TSS) as a result of sediment transport would be negligible. Over the long-term, Rush Meadows and Rush Creek would return to unimpaired conditions, which would be beneficial to water quality.

**Gem Dam Retrofit and Agnew Dam Removal**

Under the Proposed Action, SCE would retrofit Gem Dam to facilitate compliance with current seismic restrictions (water surface elevation of 9,027.5 feet) and Agnew Dam would be removed (no storage) and only the natural lake would remain (existing condition). Both reservoirs have exposed former inundation zones that could experience erosion resulting in temporary increases in turbidity/TSS in Gem Lake, Agnew Lake, and Rush Creek. Much of the Project area, however, is dominated by steep bedrock, which would be highly resistant to erosion.

The Proposed Action includes development of site-specific restoration plans to minimize the long-term potential for water quality effects from mobilization of reservoir bed and shoreline materials, and potential incision / head cutting of Rush Creek. Objectives of the restoration plans include:

- Revegetation and stabilization of sediment in the former Agnew lakebed and former Gem Lake inundation zone, as necessary.
- Reestablishment and stabilization of Rush Creek within the Agnew lakebed, as necessary.
- A 5-year monitoring period to evaluate success of the initial restoration effort. Additional restoration activities may be needed depending on monitoring results.

As discussed above, following dam removals, in general, turbidity values have been shown to increase during the removal process, but quickly return to pre-dam removal levels (Wagner 2023). Also, most sediments observed in pools in Rush Creek during relicensing studies were coarse gravels and sands (SCE 2024b), which mobilize and transport more slowly than fine sediments which would likely minimize the potential for turbidity and TSS level increases. Under existing Project operations, SCE does not perform any sediment management on Gem or Agnew lakes, further indicating that sedimentation within these reservoirs is low.

With implementation of site-specific restoration plans and retrofitting of Gem Dam and removal of Agnew Dam, long-term, the Proposed Action effects on physical water quality parameters (turbidity/TSS) as a result of sediment transport would be negligible. Over the long-term Agnew Lake would return to its natural condition (except that inflow hydrology would be affected by Gem Dam), which would be beneficial to water quality.

#### 9.3.2.3 Potential Changes to Water Quality Resulting from Herbicide use During Vegetation Management Activities

Under the No-Action Alternative, SCE uses herbicides to control weeds and vegetation encroachment on SCE-owned lands within the Rush Creek Powerhouse perimeter fence and up to 15-feet outside of the perimeter fence. All herbicides are administered by a licensed vendor using a small handheld sprayer in accordance with label instructions. Herbicides are not applied on Forest Service lands.

Under the Proposed Action, ongoing vegetation management requiring the use of herbicides would continue to be implemented as described in the No-Action Alternative (Section 4.4.6). There would be no change to how and where herbicides are applied and they would continue to be administered by a licensed vendor in accordance with label instructions and away from nearby waterbodies; therefore, there would be no effect to water quality.

#### 9.3.2.4 Environmental Measures

Implementation of operation and maintenance activities under the Proposed Action would have a negligible effect on water quality with implementation of site-specific restoration plans and the following measures (Appendix 5-C):

- Instream Flow Measure
- Recreation Reservoir Elevation Objectives Measure

#### 9.3.2.5 Unavoidable Adverse Effects

There are no unavoidable adverse effects to water quality from continued operation and maintenance of the Project under the Proposed Action.

#### 9.3.2.6 References

FERC (Federal Energy Regulatory Commission). 2024. Determination on Requests for Study Modification. February.

SCE (Southern California Edison Company). 2024a. Draft AQ 4 – Water Quality Technical Study Report. August. Available in Supporting Document A of the Application for New License.

_____. 2024b. Draft AQ 5 – Geomorphology Technical Study Report. August. Available in Supporting Document A of the Application for New License.

Wagner, Madison J and Paul A. Moore. 2023. Longitudinal study of stream ecology pre- and post- dam removal: Physical, chemical, and biological changes to a northern Michigan stream. Science of the Total Environment 912 (2024) 168848. https://doi.org/10.1016/j.scitotenv.2023.168848.

## TABLE OF CONTENTS

Page

9.3.3 Fish and Aquatics – Operation and Maintenance Effects ............................ 9.3.3-1
9.3.3.1 Aquatic Physical Environment ......................................................... 9.3.3-2
9.3.3.2 Fish and Aquatic Community ........................................................... 9.3.3-7
9.3.3.3 Special-Status Aquatic Species – Lahontan Cutthroat Trout............. 9.3.3-9
9.3.3.4 Environmental Measures ................................................................ 9.3.3-10
9.3.3.5 Unavoidable Adverse Effects ......................................................... 9.3.3-10
9.3.3.6 References .................................................................................... 9.3.3-10

## LIST OF ACRONYMS

| | |
|---|---|
| CDFW | California Department of Fish and Wildlife |
| ESA | Endangered Species Act |
| LCT | Lahontan cutthroat trout |
| Project | Rush Creek Project |
| SCE | Southern California Edison Company |
| TSR | Technical Study Report |

### 9.3.3 Fish and Aquatics – Operation and Maintenance Effects

This section describes the potential effects to fish and aquatic resources that could occur because of continued operation and maintenance activities to be implemented under the Proposed Action for Southern California Edison Company's (SCE) Rush Creek Project (Project). A description of operation and maintenance activities to be implemented under the Proposed Action is included in Section 5.

Potential effects are determined by analyzing the changes to fish and aquatics that may result from activities to be implemented under the Proposed Action compared to the No-Action Alternative (existing condition) (Section 4). Final effects determinations consider environmental measures, management, and monitoring plans (environmental measures) to be included under the Proposed Action (refer to Appendix 5-C). Unavoidable adverse effects are discussed at the end of this section.

The following potential effects to fish and aquatic resources were evaluated:

- Potential changes to the riverine and reservoir aquatic physical environment, including:
  - Water quality (including water temperature)
  - Gradient, channel geometry, and riparian vegetation
  - Sediment supply and transport
  - Hydrology and instream flow habitat
  - Fish barriers and migration
- Potential changes to the riverine and reservoir fish and aquatic community, including:
  - Fish
  - Algae, macroinvertebrates, and wetted perimeter
  - Entrainment of fish
- Potential effects to special-status aquatic species – Lahontan cutthroat trout

Refer to Section 9.3.4, Botanical and Wildlife – Operation and Maintenance Effects for analysis of potential effects to Sierra Nevada yellow-legged frog and Yosemite toad and their critical habitat.

This section relies on data collected in 2023 and reported in the AQ 1 – Instream Flow Technical Study Report (TSR) (AQ 1 – TSR, SCE 2024a), AQ 2 – Hydrology TSR (AQ 2 – TSR, SCE 2024b), AQ 3 – Water Temperature TSR (AQ 3 – TSR, SCE 2024c), AQ 4 – Water Quality TSR (AQ 4 – TSR, SCE 2024d), and AQ 6 – Fish Population and Barriers TSR (AQ 6 – TSR, SCE 2024e). Additional water quality and fish population data will be collected in 2024 and provided in updated technical study reports to be included in the Final License Application. This analysis will also be updated, as appropriate in the Final License Application.

#### 9.3.3.1 Aquatic Physical Environment

Under the Proposed Action Rush Meadows and Agnew dams would be removed and Gem Dam would be retrofitted to facilitate compliance with the seismic restrictions under a probable maximum flood event with a new spillway and reduced dam height. SCE proposes minimum instream flow requirements below Gem Dam and Agnew Lake and reservoir elevation objectives in Gem Lake, both of which are similar to the No-Action Alternative. Refer to Appendix 5-C for a description of the Minimum Instream Flow Measure and Recreation Reservoir Elevation Objectives Measure.

Continued operation of the Project under the Proposed Action could potentially affect riverine and reservoir physical habitat for fish and aquatic species. The habitat components that could potentially be affected include water quality, channel geomorphology and sediment supply and transport, hydrology, and fish barriers and migration. Potential effects are described below.

**Water Quality**

Water quality (water temperature, dissolved oxygen, contaminates) can directly affect fish and other aquatic species. Trout require water temperature typically below 20 degrees Celsius and dissolved oxygen ≥7 milligrams/liter. All aquatic species require water free of toxic contaminants and hydrocarbon products. Water quality, including water temperature, was analyzed in Section 9.3.2, Water Quality. Potential changes to reservoir water elevations, minimum instream flows, sediment transport / erosion, and herbicide use were reviewed with reference to the existing water quality in the Project area. Existing water quality in the vicinity of the Project is currently high quality (e.g., cold temperatures, high dissolved oxygen, no contaminants) and there were no Project-related water quality issues identified during studies conducted as part of relicensing (SCE 2024d). It was determined that long-term operation and maintenance of the Project would have no effect on water quality. With implementation of site-specific restoration plans, Minimum Instream Flow Measure, Recreation Reservoir Elevation Objectives Measure, and Stream and Reservoir Gaging Monitoring Plan, water quality is expected to continue to be high (no contaminants, cold water, high dissolved oxygen, low turbidity and total suspended solids) and conform to regulatory water quality objectives and standards. Therefore, there would be no effect on fish and aquatic habitat related to water quality.

## Gradient, Channel Geometry, and Riparian Vegetation

Potential impacts to gradient, channel geometry and riparian vegetation are addressed in Sections 9.3.6, Geomorphology and Section 9.3.7, Wetland, Riparian, and Littoral Habitats. Effects of long-term operation and maintenance of the Project under the Proposed Action range from negligible to beneficial. The effects vary by reach and are briefly discussed below.

River channel geomorphology (gradient, substrate, channel width, depth, and sinuosity) and riparian vegetation create rearing (e.g., cover) and spawning habitat (e.g., spawning gravels) for fish and habitat for other aquatic species (benthic algae and macroinvertebrates). Changes in these habitat features could affect the quality of stream habitat for fish and aquatic species. In the lakes, inlet channels provide potential spawning habitat and vegetated shorelines reduce erosion (shoreline water quality and substrate) and provide potential terrestrial invertebrate food sources, shading, and improved shoreline habitat.

Following the removal of Rush Meadows Dam, changes to channel gradient, channel geometry, and riparian vegetation in Rush Creek as it flows through the former Waugh lakebed are considered beneficial. With implementation of a site-specific restoration plan to revegetate and stabilize areas in the former Waugh lakebed, additional riparian vegetation would develop, and channel geometry would revert to natural stream channel morphology (e.g., pools, runs, riffles, clean spawning gravels). Negligible impacts to gradient would occur in this reach (e.g., sinuosity). Unimpaired hydrology below Rush Meadows Dam would be restored and the hydrology would benefit the Rush Creek channel geometry and riparian vegetation. Therefore, benefits to channel and riparian vegetation would enhance fish rearing and spawning habitat and habitat for aquatic species in this reach.

In Gem and Agnew lakes and in Rush Creek below Gem Dam, impacts to gradient, channel geometry, and riparian vegetation following retrofitting of Gem Dam and the removal of Agnew Dam are considered beneficial. With implementation of a site-specific restoration plan to revegetate and stabilize areas in the exposed shoreline of Gem Lake and the former Agnew Lake above the natural lake, additional vegetation would develop. The channels below Gem Dam are steep gradient and bedrock dominated. Negligible impacts to gradient and channel geometry would occur in this reach. Negligible impacts are also expected in Rush Creek below the Rush Creek Powerhouse to Grant Lake. Therefore, effects on channel and riparian vegetation habitat would have a negligible effect on spawning and rearing habitat for fish and habitat for other aquatic species in these reaches.

### Sediment Supply and Transport

Potential impacts to sediment supply and transport are addressed in Section 9.3.6, Geomorphology. Effects range from no effect to beneficial and are discussed briefly below.

Sediment supply and transport can affect channel geometry (e.g., pool habitat for fish) and channel substrates. Channel substrate, including clean gravels for spawning and coarser substrates free of fine sediment are critical habitat requirements for fish, benthic algae, and macroinvertebrates. Fine sediment releases of former Waugh Lake (reservoir) bed material could occur following removal of Rush Meadows Dam, which could cause sedimentation in downstream pools and riffles in Rush Creek. Unimpaired flows in Rush Creek below Rush Meadows Dam could also affect channel geomorphology and sediment transport due to increases in flow magnitude and duration. With implementation of a site-specific restoration plan for Rush Meadows Dam and Waugh Lake and removal of Rush Meadows Dam at an elevation that would not cause upstream headcutting or fine sediment deposition downstream that would affect fish and aquatic habitat. Operation and maintenance of the Project would have a negligible effect on sediment supply and transport. In addition, over the long-term, Rush Meadows and Rush Creek within the former footprint of Waugh Lake would return to unimpaired conditions, that would include natural channel features (e.g., pools, runs, riffles, clean spawning gravels, limited fine sediment in substrates) and riparian vegetation that would benefit fish and aquatic habitat.

Under the Proposed Action, Agnew Dam would be removed, and the natural lake would remain at the current seismic restriction level (no storage). The former reservoir footprint includes exposed inundation zones that could experience erosion. With implementation of a site-specific restoration plan for Agnew Dam and Lake, potential effects would be reduced. Much of the area is dominated by steep bedrock, which would be highly resistant to erosion. Geomorphology in Rush Creek downstream of Gem and Agnew lakes includes slightly increased frequency of high flows. This is viewed as a benefit to sediment transport (transport of fine sediment). The Proposed Action would have a negligible effect on sediment supply and transport; therefore, there would be a negligible effect on fish and other aquatic species habitat.

### Hydrology and Instream Flow Habitat

Potential impacts to hydrology (see Section 9.3.1, Water Use and Hydrology, and SCE 2024b) and instream flow habitat as a result of long-term operation of the Project varies by reach type (reservoirs and stream reaches). Potential effects are discussed below.

*PROJECT RESERVOIRS AND SILVER LAKE*

Reservoir storage (volume) provides summer habitat and overwintering habitat for fish, benthic macroinvertebrates, zooplankton, and phytoplankton. Modification to reservoir storage (volume, timing) could affect the volume of fish and aquatic species habitat and food resources for fish. Aquatic species are typically suited for either lentic (lake) habitat (e.g., zooplankton) or lotic (river) habitat. Relatively stable lentic or lotic habitat benefits fish and aquatic species.

#### *WAUGH LAKE*

With the removal of Rush Meadows Dam, Waugh Lake would no longer temporarily store water when high inflows exceed the low-level outlet capacity as occurs under existing conditions, which creates varying lentic and lotic habitat conditions throughout the year. The Proposed Action would return Waugh Lake to natural unimpaired conditions (meadow and stream), and, therefore, would allow stable stream conditions to develop and allow a suite of lotic species to colonize the stream (fish, algae, macroinvertebrates). This would have a beneficial effect on 1.5 miles of fish and aquatic species habitat compared to the No-Action Alternative.

#### *GEM LAKE*

Under the Proposed Action, Gem Lake storage would be maintained at the seismic restricted capacity of 10,752 acre-feet and 9,027.5 feet maximum operating water surface elevation. With implementation of the Recreation Reservoir Elevation Objectives Measure (Appendix 5-C) the reservoir would operate similar to the No-Action Alternative. Therefore, the Proposed Action hydrology would maintain lentic habitat for fish and aquatic species in Gem Lake and there would be no effect compared to the No-Action Alternative.

#### *AGNEW LAKE*

Under the Proposed Action, Agnew Lake would continue at the natural lake level that currently exists and there would be no change to the aquatic physical environment that currently exists. The Proposed Action would result in the same lentic habitat for fish and aquatic species in Agnew Lake and there would be no effect compared to the No-Action Alternative.

#### *SILVER LAKE*

Under the Proposed Action, the water surface elevation of Silver Lake would remain unaffected compared to existing conditions. It is anticipated there would be a small increase in naturally occurring high-flow events entering Silver Lake (see Section 9.3.1.3). This may cause a small increase in overbanking in the marshy area at the head of Silver Lake during the May and June high-flow period and create additional juvenile rearing habitat. However, these changes would be small and Silver Lake would otherwise remain very similar to existing conditions. Long-term operation of the Project would have a negligible effect on the fish and aquatic species habitat in Silver Lake compared to the No-Action Alternative.

### *STREAM REACHES*

Streamflow, both the higher winter/spring flows and lower summer/fall create fish rearing and spawning habitat and habitat for other aquatic species (benthic algae and macroinvertebrates). Aquatic species life history strategies are typically dependent on both the seasonal flow timing and magnitude. Higher spring flows provide spawning habitat in pool tailouts and inundate stream margin habitats that provide rearing habitat for juvenile fish. Low summer / fall flows can create a habitat bottleneck that limits the fish carrying capacity of the stream and benthic habitat (habitat area) for algae and macroinvertebrates.

Changes to hydrology related to both minimum instream flows and high flows are discussed in Section 9.3.1. Following removal of Rush Meadows Dam, natural (unimpaired) hydrology would pass through the former lakebed and downstream to Gem Lake. The natural hydrology would be considered beneficial for stream ecology (habitat and species). Below Gem Dam, minimum flow requirements would be the same as the No-Action Alternative (similar low-flow aquatic habitat conditions). There would be a small increase in high-flow events below Gem Dam and downstream in Rush Creek. In general, these are very small incremental increases toward unimpaired flows. A discussion of fish and aquatic habitat based on either the presence of unimpaired flows above Gem Lake and/or fish habitat time-series analysis below Gem Dam (Section 8.4.5.4; AQ 1 – TSR, SCE 2024a) is presented below.

***RUSH CREEK – WAUGH LAKEBED TO GEM DAM***

With restoration of Waugh Lake to natural unimpaired lotic conditions (meadow and stream) and unimpaired flows in Rush Creek downstream to Gem Lake, riverine rearing and spawning habitat for rainbow and brook trout would exist throughout the reach. The natural unimpaired flows would have a beneficial effect on the lotic fish and aquatic community habitat compared to the No-Action Alternative.

***RUSH CREEK – GEM DAM TO GRANT LAKE***

Long-term operation and maintenance of the Project, including minimum instream flow requirements and reservoir elevation objectives (Appendix 5-C), would result in hydrology in Rush Creek from Gem Dam to Grant Lake that is similar to existing conditions. The AQ 1 – TSR (SCE 2024a) quantifies time-series habitat from 1990 through 2021 for each of the trout life stages (adult, juvenile, fry, and spawning). Monthly time-series exceedance figures are presented in Section 8.4.5.4 and in Appendix N of the AQ 1 – TSR (SCE 2024a). For all reaches (Rush Creek below Gem Dam, Rush Creek above Silver Lake, Rush Creek below Silver Lake and South Rush Creek), the Proposed Action and existing conditions habitat are nearly identical. Long-term operation and maintenance of the Project would have a negligible effect on fish and aquatic habitat compared to the No-Action Alternative.

## Fish Barriers and Migration

The AQ 6 – TSR (SCE 2024e) quantified fish passage barriers from above Grant Lake upstream to above Waugh Lake. Particularly in Rush Creek upstream of the Rush Creek Powerhouse, the steep gradient channel includes many natural barriers. There are also several anthropogenic barriers (dams, gaging facilities). The natural barriers and most of the manmade barriers would not change with implementation of the Proposed Action. Under the Proposed Action, however, Rush Meadows Dam and Agnew Dam would be removed. Removal of Agnew Dam would not affect fish passage as the dam is built on a bedrock shelf that creates a natural upstream migration barrier even with the dam removed. Removal of Rush Meadows Dam, however, would allow improved fish passage. Also, at the inflow to Silver Lake there is a critical riffle that is a shallow depth migration barrier under seasonal low-flow conditions. This barrier could be slightly modified (improved depth) by natural channel processes such as the increased frequency of higher flows under the Proposed Action, however, the riffle is likely to remain a potential seasonal low-flow barrier.

Overall, because long-term operation of the Project has limited effect on hydrology and because of the many natural barriers throughout Rush Creek, the Proposed Action would have a negligible effect on fish passage and migration in most of the Project area and beneficial fish passage effects would occur at Rush Meadows Dam.

#### 9.3.3.2 Fish and Aquatic Community

Potential effects on the fish population and aquatic community from long-term operation of the Project varies by reach type (reservoirs and stream reaches). Potential effects are discussed below.

**Project Reservoirs and Silver Lake**

*WAUGH LAKE*

Removal of Rush Meadows Dam would benefit brook and rainbow trout populations and other aquatic species (benthic invertebrates) in the former Waugh lakebed. Under existing conditions, the lakebed consists of continually varying lotic (riverine) and lentic (lake) habitats that aquatic species typically cannot successfully colonize. With restoration of the lakebed to natural lotic habitat and implementation of a site-specific restoration plan, the fish population and benthic species (macroinvertebrates, algae) would increase compared to the No-Action Alternative. This would create 1.5 miles of restored stream/meadow habitat and would be an ecological benefit (species and habitat).

*GEM LAKE*

Under the Proposed Action, the aquatic physical environment of Gem Lake is anticipated to be similar to existing conditions (Section 9.3.3.1). In addition, annual California Department of Fish and Wildlife (CDFW) aerial stocking of fingerling rainbow trout would continue to occur. Therefore, the Proposed Action would have a negligible effect on the fish population (brook and rainbow trout) and the aquatic community (e.g., zooplankton and phytoplankton).

*AGNEW LAKE*

The Proposed Action would not change the aquatic physical environment that currently exists within the natural Agnew Lake (Section 9.3.3.1). In addition, annual CDFW aerial stocking of fingerling rainbow trout would continue to occur. Therefore, the Proposed Action would have no effect on the fish population (rainbow and brook trout) and the aquatic community of the existing natural lake compared to the No-Action Alternative.

*SILVER LAKE*

The Proposed Action would not change the aquatic physical environment that currently exists within Silver Lake (Section 9.3.3.1). Annual CDFW stocking of catchable rainbow trout, fingerling Eagle Lake trout, and fingerling Lahontan cutthroat trout would continue to occur. As described in the Fish Stocking Measure (Appendix 5-C), SCE would continue stocking of 1,000 catchable-sized rainbow trout every five years in Silver Lake. No change to the fish (brook, rainbow, and brown trout) and aquatic community (zooplankton and phytoplankton) in Silver Lake is anticipated under the Proposed Action; therefore, there would be no effect.

## Stream Reaches

*FISH*

***RUSH CREEK – WAUGH LAKEBED TO GEM DAM***

With removal of Rush Meadows Dam (a fish passage barrier) and subsequent restoration of the former lakebed to natural stream habitat, a change in the distribution and age structure of the rainbow and brook trout population would occur. Fish would re-colonize this reach and their density would increase to natural population levels. The fish population downstream of the former Rush Meadows Dam (Rush Creek to Gem Lake) consists of brook trout, rainbow trout, and golden x rainbow trout hybrids. The population would benefit due to enhanced upstream and downstream fish movement potential with removal of the dam. Therefore, the Proposed Action would be beneficial to the fish population in this reach compared to the No-Action Alternative.

***RUSH CREEK – GEM DAM TO GRANT LAKE***

Aquatic habitat (e.g., hydrology, barriers, stocking) downstream of Gem Dam to Grant Lake is expected to remain similar to existing conditions (Section 9.3.3.1) under the Proposed Action. CDFW fish stocking would continue to occur in the lakes (Agnew and Silver lakes) and in Rush Creek downstream of Silver Lake (Section 8.4.7). Special CDFW fishing regulations (season and possession limit) would remain in effect from Silver Lake downstream to Grant Lake. Therefore, the Proposed Action would have a negligible effect on the fish population and aquatic community (e.g., macroinvertebrates) compared to the No-Action Alternative.

*BENTHIC ALGAE, MACROINVERTEBRATES, WETTED PERIMETER*

Following the removal of Rush Meadows Dam and with implementation of a site-specific restoration plan, the physical aquatic habitat would change to natural lotic conditions within the former lakebed. There would be beneficial change in the benthic community to lotic algae and macroinvertebrate species. Therefore, the Proposed Action would benefit algae and macroinvertebrate diversity, density and productivity in the former Waugh Lake.

Within the other Rush Creek reaches, the Proposed Action would result in minimal hydrology and/or aquatic physical habitat change (Section 9.3.3.1). The Proposed Action would include the Minimum Instream Flow Measure and the Gem Lake Recreation Reservoir Elevation Objectives Measure (Appendix 5-C). As a result, hydrology in Rush Creek from Gem Dam to Grant Lake would be similar to existing conditions. The AQ 1 – TSR (SCE 2024a) quantifies wetted perimeter time-series habitat from 1990 through 2021. Monthly time-series exceedance figures in Appendix O of the AQ 1 – TSR (SCE 2024a) for all reaches (Rush Creek below Gem Dam, Rush Creek above Silver Lake, Rush Creek below Silver Lake and South Rush Creek) show that Proposed Action and existing conditions wetted perimeter is nearly identical. Therefore, negligible change to the existing benthic algae and macroinvertebrate community is anticipated from continued operation of the Project.

**Entrainment**

Sada (2001) assessed trout mortality caused by entrainment at the Gem and Agnew Lake intakes through the Rush Creek Powerhouse turbines. Estimated annual mortality in 2000 was 194.9 fish (183.7 brook trout and 8.7 rainbow trout). Entrainment rates at the Gem intake are expected to be similar to those measured by Sada (2001). Under both existing conditions and the Proposed Action, no entrainment occurs from Agnew Lake due to removal of the intake. With implementation of the Fish Stocking Measure, which is the same as existing SCE stocking, entrainment would be offset similar to existing conditions. Therefore, the Proposed Action would have no effect on entrainment rates relative to the No-Action Alternative.

### 9.3.3.3 Special-Status Aquatic Species – Lahontan Cutthroat Trout

Lahontan cutthroat trout (LCT), a special-status aquatic species is present in the vicinity of the Project. LCT were listed as endangered under the federal Endangered Species Act (ESA) on October 13, 1970 (35 FR16047 16048), and downlisted to threatened on July 16, 1975 (40 FR 29863 29864) with a section 4(d) rule that allows resident species of fish or wildlife to be taken in accordance with state law pursuant to section 6(c) of the ESA. Consequently, LCT have played an important role in recreational fishing in Nevada, California, and Oregon. They are raised in state, federal and Tribal hatcheries for both recovery and recreational fishing purposes. LCT are stocked annually by CDFW in Silver Lake. During fish surveys in 2023 (electrofishing and snorkeling) in Rush Creek upstream and downstream of Silver Lake, LCT were not observed. The abundance of LCT appears to be low and likely limited to Silver Lake in the vicinity of the Project. LCT are not expected to occur within the Project area unless stocked by CDFW. Fishing pressure (harvest) is likely the primary limiting factor on LCT abundance. Continued operation of the Project under the Proposed Action would have a negligible effect on Silver Lake habitat (Section 9.3.3.1) and Rush Creek stream habitat as compared to the No-Action Alternative; therefore, the Proposed Action would have a negligible effect on Lahontan cutthroat trout.

#### 9.3.3.4 Environmental Measures

Implementation of operation and maintenance activities under the Proposed Action would have a negligible to beneficial effect on fish and aquatic resources, depending on the reach, with implementation of the following measures (Appendix 5-C):

- Instream Flow Measure
- Recreation Reservoir Elevation Objectives Measure
- Stream and Reservoir Gaging Monitoring Plan
- Fish Stocking Plan

#### 9.3.3.5 Unavoidable Adverse Effects

There are no unavoidable adverse effects to fish and aquatic resources from continued operation and maintenance of the Project under the Proposed Action.

#### 9.3.3.6 References

Sada, D.W. 2001. Turbine-induced Trout Mortality During 1998–2000 Rush Creek, Mono County, California. Prepared for SCE by Desert Research Institute 2215 Raggio Parkway, Reno, Nevada.

SCE (Southern California Edison Company). 2024a. Draft AQ 1 – Instream Flow Technical Study Report. August. Available in Supporting Document A of the Application for New License.

____. 2024b. Draft AQ 2 – Hydrology Technical Study Report. August. Available in Supporting Document A of the Application for New License.

____. 2024c. Draft AQ 3 – Water Temperature Technical Study Report. August. Available in Supporting Document A of the Application for New License.

____. 2024d. Draft AQ 4 – Water Quality Technical Study Report. August. Available in Supporting Document A of the Application for New License.

____. 2024e. Draft AQ 6 – Fish Population and Barriers Technical Study Report. August. Available in Supporting Document A of the Application for New License.

## TABLE OF CONTENTS

Page

9.3.4 Botanical and Wildlife Resources – Operation and Maintenance Effects ... 9.3.4-1
9.3.4.1 Effects to Botanical Resources ... 9.3.4-3
9.3.4.2 Effects to Wildlife Resources ... 9.3.4-7
9.3.4.3 Environmental Measures ... 9.3.4-27
9.3.4.4 Unavoidable Adverse Effects ... 9.3.4-27
9.3.4.5 References ... 9.3.4-27

## LIST OF ACRONYMS

| | |
|---|---|
| BCC | Bird of Conservation Concern |
| CDFW | California Department of Fish and Wildlife |
| CFP | California Fully Protected |
| cfs | cubic feet per second |
| CSC | California Species of Special Concern |
| Eagle Act | Bald and Golden Eagle Protection Act |
| ESA | Endangered Species Act |
| FE | Federal Endangered |
| FERC | Federal Energy Regulatory Commission |
| FSCC | Forest Species of Conservation Concern |
| FT | Federal Threatened |
| kV | kilovolt |
| MIF | minimum instream flow |
| NNIP | non-native invasive plant |
| PCA | Pest Control Advisor |
| PCE | Primary Constituent Element |
| Project | Rush Creek Project |
| SCE | Southern California Edison Company |
| SD | Supporting Document |
| SE | State Endangered |
| SNYLF | Sierra Nevada yellow-legged frog |
| ST | State Threatened |
| TSP | Technical Study Plan |
| TSR | Technical Study Report |
| TSS | total suspended solids |
| USFWS | United States Fish and Wildlife Service |
| YT | Yosemite toad |

### 9.3.4 Botanical and Wildlife Resources – Operation and Maintenance Effects

This section describes the potential effects to botanical and wildlife resources that could occur because of continued operation and maintenance activities to be implemented under the Proposed Action for Southern California Edison Company's (SCE) Rush Creek Project (Project). A description of operation and maintenance activities to be implemented under the Proposed Action is included in Section 5. Following the construction activities, Rush Meadows and Agnew dams would be removed from the Federal Energy Regulatory Commission (FERC) Project boundary and would no longer require operations and maintenance actions. Long term operations and maintenance would occur at Gem Dam, the Rush Creek Powerhouse, and any infrastructure remaining between the powerhouse and Gem Dam (analysis area). For special-status wildlife species, this also includes helicopter flight paths necessary for operation and maintenance of the Project.

Potential effects are determined by analyzing the changes in botanical and wildlife resources that may result from activities to be implemented under the Proposed Action compared to the No-Action Alternative (existing condition) (Section 4). Final effects determinations consider environmental measures, management, and monitoring plans (environmental measures) to be included under the Proposed Action (refer to Section 5, Appendix 5-C). Unavoidable adverse effects are discussed at the end of this section.

The following potential effects to botanical and wildlife resources because of continued operation and maintenance activities were evaluated:

**Potential Effects to Botanical Resources**

- Potential loss or disturbance of special-status plants, including whitebark pine and alpine bentgrass, from long-term maintenance activities
- Potential introduction or spread of non-native invasive plant species (NNIP) during routine maintenance activities
- Long-term benefit to botanical resources resulting from a reduction in the operation and maintenance area footprint and restoration

**Potential Effects to Wildlife Resources**

- Potential effects to special-status invertebrate species resulting from:
  - Vegetation management activities (trimming by hand and herbicide application)
  - Introduction or spread of NNIPs during routine maintenance activities
  - Long-term benefit to special-status invertebrate habitat resulting from a reduction in the operation and maintenance area footprint and restoration

- Potential effects to special-status amphibians and federally designated Critical Habitat resulting from:
  - Vegetation management activities (trimming by hand and herbicide application)
  - Changes in Project operations
  - Continued fish stocking in Silver Lake
  - Long-term benefit from a reduction in the operation and maintenance area footprint and restoration
- Potential effects to nesting or foraging raptors from:
  - Helicopter use associated with long-term maintenance and operations activities
  - Electrocution on Project power lines or removal of active nests during powerline maintenance activities
  - Changes in operations
  - Long-term benefit to raptors resulting from a reduction in the operations and maintenance area footprint and restoration
- Potential effects to other special-status birds or their habitat from:
  - Vegetation management activities (trimming by hand and herbicide application)
  - Changes in operations
  - Introduction or spread of NNIPs during routine maintenance activities
  - Long-term benefit to other special-status birds resulting from a reduction in the operation and maintenance area footprint and restoration
- Potential effects to special-status bats resulting from:
  - Long-term maintenance of Project facilities supporting bat roosts
  - Changes in operations
  - Long-term benefit to special-status bats from a reduction in operations and maintenance area footprint and restoration

- Potential effects to special-status and game mammals resulting from
  - Helicopter use for long-term operations and maintenance activities
  - Long-term benefit to special-status mammals and game mammals resulting from a reduction in the operations and maintenance area footprint

Potential effects to special-status fish and aquatic resources are discussed in Section 9.3.3, Fish and Aquatic Resources – Operation and Maintenance Effects. Potential effects to wetland, riparian, and littoral habitats are identified in Section 9.3.7, Wetland, Riparian, and Littoral Habitats – Operation and Maintenance Effects.

This section relies on data collected in 2022–2023 as part of the TERR 1 – Botanical Resources Technical Study Plan (TSP), TERR 2 – Wildlife Resources TSP, and AQ 7 – Special-status Amphibians TSP. Certain components of the TERR 2 – Wildlife Resources TSP were not completed in 2023. Specifically, nesting raptor surveys and special-status bat roost and seasonal use surveys were delayed to 2024 to ensure that data obtained was representative of the study area (not collected in a year with substantial snowpack). Resource agencies and stakeholders approved the study delays in a meeting held on May 11, 2023.

California Department of Fish and Wildlife (CDFW) and State Water Resources Control Board also requested an additional year of special-status amphibian surveys that are planned for 2024.

Data collected in 2024 will be analyzed and reported following the end of the 2024 field season. Results from 2024 studies will be provided in an updated technical study report to be included in the Final License Application. In addition, this analysis will be updated, as appropriate, in the Final License Application.

A discussion of the potential effects to botanical and wildlife resources that could occur as a result of long-term operations and maintenance activities, considering new environmental measures; management and monitoring plans; and existing SCE programs, is provided below.

#### 9.3.4.1 Effects to Botanical Resources

This section presents an evaluation of potential effects of operation and maintenance activities to be implemented under the Proposed Action on botanical resources. This includes potential direct and indirect effects to special-status plants and potential introduction or spread of NNIPs.

The analysis area for effects to botanical resources is defined to include the area where maintenance activities are implemented as part of the Proposed Action. Refer to Section 4, No-Action Alternative for the area where maintenance activities are implemented around Project facilities. Refer to Section 8.5, Table 8.5-2 for a list of special-status plants known to occur or potentially occurring in the vicinity of the Rush Creek

Project, and their status and habitat requirements. Section 8.5, Table 8.5-4 provides a list of NNIP populations identified in the vicinity of the Rush Creek Project.

## Special-Status Plants

Two special-status plant species—whitebark pine (*Pinus albicaulis*; Federal Threatened [FT]) and alpine bentgrass (*Agrostis humilis* (Forest Service Species of Concern [FSCC], California Rare Plant Rank 2B.3) occur in the analysis area. No other special-status plant species were documented during special-status plant surveys conducted in support of the TERR 1 – Botanical Resources studies (TERR 1 – Botanical Resources Technical Study Report [TSR] [TERR 1 – TSR]) (SCE 2024a, Supporting Document [SD] A).

Several vegetation alliances that are defined as sensitive natural communities are present in the analysis area, including whitebark pine, quaking aspen, wet meadows, and willow alliances.

Provided below is an evaluation of potential direct and indirect effects to special-status plants from ongoing Project operations and maintenance, including potential effects to individuals within whitebark pine alliances. Refer to Section 9.3.7, Wetland, Riparian, and Littoral Habitats for a discussion of potential impacts to quaking aspen, wet meadows, and willow alliances.

### *WHITEBARK PINE*

Whitebark pine was documented during botanical surveys conducted in support of the TERR 1 botanical studies (SCE 2024a, SD A). Whitebark pine is only differentiable from other five-needle pines when it reaches a sufficient size to produce cones and mature bark. Therefore, young five-needle pines that were not distinguishable to species were also mapped in the analysis area. The analysis of potential effects of whitebark pines provided below (and associated environmental measures) is inclusive of both whitebark pines and young (“unknown”) five-needle pines.

Due to the proximity and abundance of adult whitebark pine in the analysis area, whitebark pine seedlings could establish in other areas where vegetation management (trimming by hand) is implemented over time.

Provided below is a description of potential direct and indirect effects to whitebark pine resulting from long-term maintenance.

#### *DIRECT EFFECTS*

One population of whitebark pine (PIAL 37, 1.04 acres) and two populations of five needle pines (U5NP 9 [0.54 acre] and U5NP 10 [0.22 acre]) were documented adjacent to the following Project facilities where vegetation management activities are implemented (trimming by hand):

- Communication line from Rush Creek Powerhouse to Gem Lake Dam

- Gem Dam to Agnew Junction Flowline
- Gem Tram
- Upper Gem Dam Access Trail

Vegetation management around Project facilities listed above could result in direct loss of individual whitebark pine and young five needle pines located in populations PIAL 37, U5NP 9, or U5NP 10. In addition, these populations could expand during the license term to other areas near Gem Dam where vegetation management (trimming by hand) is implemented.

SCE only uses herbicides on SCE-owned lands at the Rush Creek Powerhouse Complex. There are no whitebark pines or young five needle pines present where herbicides are used.

To minimize the potential for direct loss of whitebark pine individuals, SCE will implement the Vegetation Management Measure over the term of the new license. This measure includes conducting surveys for whitebark pines every 5 years following license issuance, flagging and avoidance of whitebark pine individuals, and continued implementation of SCE's Environmental Awareness Training (including training on identification of whitebark pine and associated environmental measures). Refer to Section 5, Appendix 5-C for a complete description of new environmental measures, management, and monitoring plans to be implemented as part of the Proposed Action, including the Vegetation Management Measure. With implementation of measures, ongoing operation and maintenance of the Project would maintain whitebark pine.

*INDIRECT EFFECTS*

Under the Proposed Action, long-term operations and maintenance activities would be reduced compared to the existing condition. Following construction activities, Rush Meadow Dam and Agnew Dam would be removed, the former lakebeds (as well as channel of Rush Creek within the lakebeds) would be restored and would no longer require operation or maintenance actions. Therefore, the footprint within which operations or maintenance is conducted would be significantly reduced.

The reduction in operations and maintenance and restoration would, over time, result in an increase in habitat available for ongoing establishment of native vegetation. Because large populations of whitebark pine are present along the shoreline of Waugh Lake and there is a population along the shoreline of Agnew Lake, whitebark pine individuals would likely become re-established in these areas. Therefore, the reduction in long-term operations and maintenance is expected to indirectly benefit whitebark pine.

Considering that herbicide use over the term of the new license would not affect whitebark pine individuals, and with implementation of the Vegetation Management Measures, effects to whitebark pine and their habitat resulting from implementation of long-term operations and maintenance under the Proposed Action would be negligible. Over the long-term, the reduction in operation and maintenance and associated restoration activities under the Proposed Action would result in an overall benefit to whitebark pine and their habitat.

***ALPINE BENTGRASS***

As described above, two occurrences of alpine bentgrass have been previously documented at two Rush Creek riparian monitoring sites, the first approximately 400 feet downstream of Rush Meadows Dam; and the second approximately 0.5 mile downstream of Rush Meadows Dam. SCE does not currently implement maintenance activities near these populations; and no maintenance activities would be implemented at these locations under the Proposed Action. Therefore, there would continue to be no direct effects to alpine bentgrass.

Under the Proposed Action, SCE would discontinue minimum instream flows (MIF) and ramping rates, and natural, unimpaired flows would be re-established in Rush Creek downstream of Rush Meadows Dam. Alpine bentgrass is typically found in meadow habitats, including wet meadows. Restoration of unimpaired flows along Rush Creek is expected to have a neutral to beneficial indirect effect on riparian and wet meadow species, such as alpine bentgrass.

### Non-Native Invasive Plants

Following construction and restoration activities, Rush Meadows and Agnew dams and associated facilities would be removed, would no longer require operation or maintenance actions, and the former dam and facility sites would be restored. As described in Section 9.2.4, ongoing monitoring and treatment of NNIPs within the restored lakebeds or perimeter of lakes would be implemented consistent with the Restoration Plan for each site. Implementation of the restoration plans for Waugh Lake and Agnew Lake, in combination with the cessation of ongoing maintenance activities in the vicinity of Waugh Lake and Agnew Lake, would minimize the potential for introduction or spread of NNIPs in these areas.

NNIPs are uncommon and present in low densities in the analysis area. Provided below is a list of NNIP populations occurring in areas where ongoing maintenance activities would continue to be implemented under the Proposed Action:

- Three populations in the Gem Dam Area consist of curly dock, cheatgrass, and/or common mullein.
- Fifteen populations in the Agnew Dam Area consist of curly dock, cheatgrass, common mullein, common dandelion, white sweetclover, and/or unknown melilotus ssp.

- Twenty-one populations in the Rush Creek Powerhouse Area consisting of curly dock, cheatgrass, yellow salsify, red sandspurry, white clover, white sweetclover, common mullein, common dandelion, prostrate knotweed, soapwort, and/or bull thistle.

Refer to Section 8.5, Map 8.5-4 for the location of these NNIP populations.

Transport of materials on Project trams and foot traffic associated with long-term maintenance of the Project has some potential to introduce new NNIPs or expand existing NNIP populations. To minimize the potential for introduction or spread of NNIPs, SCE will implement measures specified in the Vegetation Management Measure, including training, maintaining stockpiles weed-free, removal and properly disposing of observable weed seeds and plant parts from clothing and boots, and use of certified weed free material for erosion control. Continued implementation of SCE's Environmental Awareness Training (including training on NNIPs) would further minimize effects associated with NNIPs. Refer to Section 5, Appendix 5-C for a complete description of the Vegetation Management Measure to be implemented as part of the Proposed Action.

Considering the reduction in operation and maintenance under the Proposed Action, and with implementation of the Vegetation Management Measure, the potential for introduction and spread of NNIPs would be reduced under the Proposed Action, and effects would be considered negligible.

#### 9.3.4.2 Effects to Wildlife Resources

This section presents an evaluation of potential effects of operation and maintenance activities to be implemented under the Proposed Action on wildlife resources, including species listed under the Endangered Species Act (ESA), as well as other special-status wildlife and game species. For this analysis, species have been grouped to include taxonomically similar species, including special-status invertebrates, special-status amphibians, special-status raptors and other birds (including game birds), special-status bats, and special-status mammals (including game mammals).

The analysis area for wildlife resources is defined to include the area where maintenance activities would be implemented as part of the Proposed Action, as well as Project reservoirs and Project-affected reaches affected by operations of the Project. As described previously, under the Proposed Action, Rush Meadows Dam and Agnew Dam would be removed and would no longer require operation or maintenance; but operations and maintenance of facilities associated with Gem Dam and the Rush Creek Powerhouse would continue as described under the No-Action Alternative. Refer to Section 4, No-Action Alternative for the area where maintenance activities are implemented around these Project facilities. Refer to Section 8.5, Table 8.5-5 for a list of special-status wildlife species known to occur or potentially occurring in the analysis area, and their status and habitat requirements. Section 8.5, Table 8.5-6 provides a list of resident and migratory game species potentially occurring in the analysis area.

A description of the potential effects of the Proposed Action on wildlife resources from Project operations and maintenance, as well as measures proposed to minimize the potential effects and/or benefit the species, is provided below.

**Special-Status Invertebrates**

Monarch butterflies (*Danaus plexippus; Federal Candidate*), which are candidates for listing under the ESA, were observed during technical studies conducted in 2023 (SCE 2024b, SD A). Milkweeds (*Asclepias* spp.) are the larval host plant for monarchs. No milkweeds were identified during TERR 1 botanical surveys (SCE 2024a, SD A); therefore, the species is unlikely to breed in the analysis area. However, other floral resources located in the proposed construction areas may provide foraging habitat for migratory individuals.

In addition, three FSCC butterfly species may potentially occur the analysis area:

- Sierra sulphur butterfly (*Colias behrii*) (FSCC). This species utilizes *Vaccinium* spp. as its larval host plant. *V. uliginosum* (blueberry), which grows on wet, acidic soils in the understory of coniferous forest habitat, was identified during TERR 1 botanical surveys (SCE 2024a, SD A).

- Mono Lake checkerspot butterfly (*Euphydryas editha monoensis*) (FSCC) utilizes blue-eyed mary (*Collinsia parviflora*), which grows in moist, shady montane forest habitat. This plant was identified during TERR 1 botanical studies (SCE 2024a, SD A).

- Apache fritillary butterfly (*Speyeria nokomis apacheana*) (FSCC). This butterfly uses the northern bog violet (*Viola nephryphylla*), which grows among willows, grasses, and sedges in seeps, springs, and riparian areas. Northern bog violet was not identified during the TERR 1 botanical surveys (SCE 2024a, SD A).

Provided below is a discussion of potential direct effects to individuals, as well as indirect effects to habitat for special-status invertebrates.

***DIRECT EFFECTS***

The larval host plants for monarch butterfly and Apache fritillary butterfly were not identified during TERR 1 botanical surveys (SCE 2024a, SD A); therefore, vegetation management (trimming by hand and herbicide use) would not result in effects to breeding for these species.

Based on field surveys and review of aerial maps showing vegetation communities, all areas where vegetation management is implemented are barren or support non-native grasses and low growing shrubs, except for two areas where riparian vegetation is present. This includes a small area under the 4-kilovolt (kV) Agnew Distribution Line and along the Rush Creek Powerhouse Complex Access Road and associated bridges over the Rush Creek Powerhouse Tailrace and Rush Creek. Larval host plants for Sierra Sulphur butterfly and Mono Lake checkerspot butterfly could potentially be present in these riparian areas. However, because trimming by hand is focused on controlling tall, woody vegetation that may come in contact with the distribution line or impede access on the Rush Creek Powerhouse Complex Access Road, it is unlikely that trimming of vegetation would affect larval host plants or breeding special-status invertebrates.

In addition, herbicide use within the Rush Creek Powerhouse Complex could affect larval host plants or breeding special-status invertebrates if they become established during the term of the license. However, herbicides would continue to be applied under the supervision of a Pest Control Advisor (PCA) and consistent with label instruction (application methods, protective buffers for aquatic habitats). Best Management Practices will be implemented to minimize the potential for spills, establish transport and storage protocols, and reduce the overall risk of potential effects. Therefore, potential effects to host plants or breeding special-status invertebrates from herbicide application would be negligible.

Continued implementation of SCE's Environmental Training Program would further minimize potential direct effects to special-status invertebrates. SCE currently implements the training program to educate personnel and contractors (as appropriate) about special-status biological species, avian protection, nesting birds, and cultural resources in the vicinity of the Project. SCE will add special-status invertebrates as a special-status biological species to the program. The Environmental Training Program will continue to be administered annually.

Because larval host plants are not present or unlikely to be present within vegetation management areas, foraging habitat is limited in vegetation management areas, and with implementation of the Environmental Training Program, effects on special-status invertebrates would be considered negligible.

***INDIRECT EFFECTS***

As described previously, vegetation management in riparian areas is focused on trimming of tall, woody vegetation that may touch distribution lines or impede access to facilities. Other routine maintenance areas do not support abundant floral resources for special-status butterflies. Therefore, vegetation management is unlikely to result in removal of foraging habitat or host plants for special-status invertebrates.

Foot traffic and transport of materials associated with operation and maintenance activities could degrade native plant habitat for special-status invertebrates through the introduction or spread of NNIPs. The potential for the introduction or spread of NNIPs would be minimized through implementation of the Vegetation Management Measure that includes a NNIP training program and measures to prevent the introduction and spread of NNIP. Refer to Section 5, Appendix 5-C for a complete description of the Vegetation Management Measure to be implemented as part of the Proposed Action.

As described above, under the Proposed Action, long-term operations and maintenance activities would be reduced compared to the existing condition. Following construction activities, Rush Meadows and Agnew dams and associated facilities would be removed, would no longer require operation or maintenance actions, and the dam and facility sites would be restored. The reduction of maintenance and restoration of the lakebed at Waugh Lake and the perimeter of the natural lake at Agnew would, over time, result in a potential increase in habitat available for establishment of flowering plants and host plants for special-status invertebrates. Therefore, in the long-term the Proposed Action is expected to benefit special-status invertebrates through increased quality and quantity of available breeding and foraging habitat.

Because larval host plants are not present or unlikely to be present within vegetation management areas, foraging habitat is limited in vegetation management areas, with implementation of the Vegetation Management Measures, and the overall reduction in operation and maintenance activities and restoration, implementation of the Proposed Action would have negligible effects on special-status invertebrate habitat. Over the long-term the Proposed Action would potentially benefit special-status invertebrates through the increased habitat available to support flowering plants and host plants.

### Special-Status Amphibians

The Proposed Project footprint is within the geographic range of two ESA-listed special-status amphibians, the Sierra Nevada yellow-legged frog (*Rana sierrae* [SNYLF]) (Federal Endangered [FE]) and Yosemite toad (*Anaxyrus canorus* [YT]) (FT). United States Fish and Wildlife Service (USFWS)-designated Critical Habitat for SNYLF and YT overlaps with the current boundary of the Rush Creek Project. Refer to Section 8.5, Map 8.5-6 for the location of critical habitat for both species.

Provided below is a discussion of potential direct effects to Critical Habitat and individuals, as well as indirect effects to habitat for special-status amphibians from operation and maintenance of the Project.

#### ***DIRECT EFFECTS***

##### *CRITICAL HABITAT*

Critical Habitat for SNYLF and YT overlaps Waugh Lake and Rush Creek from Rush Meadows Dam to Gem Lake. Critical Habitat for SNYLF is also mapped on the shoreline of Gem Lake, but Gem Lake itself is excluded.

As described in Section 9.2.4, while proposed Project facility modifications may temporarily affect the quality of Primary Constituent Elements (PCE) within aquatic non-breeding habitat for SNYLF and within upland habitat for both SNYLF and YT in the immediate vicinity of the Rush Meadows Dam construction area, post-construction restoration activities, including the restoration of the former Waugh Lake lakebed (as well as the channel of Rush Creek within the lakebed); and restoration of the former inundation zone around Gem Lake are expected to have a beneficial effect to PCEs for SNYLF and YT within Critical Habitat.

Under the Proposed Action, long-term operations and maintenance activities would be reduced compared to the existing condition. Following construction activities, Rush Meadows Dam would be removed and would no longer require maintenance actions. While SCE would continue to operate Gem Dam, the shoreline around Gem Lake upstream of the Gem Dam would not be subject to ongoing maintenance activities. The reduction in the maintenance footprint would further benefit PCEs within aquatic and upland habitat for special-status amphibians by eliminating Project-induced foot traffic, use of equipment, and ground disturbance within natural areas.

Under the Proposed Action, natural, unimpaired flows would be re-established in Rush Creek within the lakebed and in Rush Creek downstream of Rush Meadows Dam to Gem Lake. Gem Lake reservoir elevations would be maintained as described in the Recreation Reservoir Elevation Objectives Measure (Appendix 5-C). Restoration of natural flows within Rush Creek above Gem Lake, and implementation of reservoir elevations in Gem Lake consistent with the Recreation Reservoir Elevation Objectives Measure, would have a neutral to beneficial effect on aquatic PCEs for SNYLF (e.g., maintenance of natural flow patterns, including periodic flooding; and provision of shallow microhabitats with solar exposure). These neutral to beneficial effects would likely be offset by the fact that these water bodies would continue to support populations of trout, which reduce the suitability of habitat for SNYLF or YT populations.

Considering that the proposed Project facility modifications and subsequent restoration activities are expected to improve both aquatic and upland PCEs for SNYLF; and with reduced maintenance activities and restoration of natural hydrology within Rush Creek above and below the former Rush Meadows Dam, the Proposed Action overall would likely have a neutral or beneficial effect on PCEs for Critical Habitat for SNYLF and YT.

*INDIVIDUALS*

SNYLF and YT were not observed during visual encounter surveys conducted in 2023 in support of the AQ 7 amphibian studies (AQ 7 – Special-Status Amphibian TSR [AQ 7 – TSR]) (SCE 2024c, SD A). Additional visual encounter surveys for both species are planned for the summer of 2024. While there is some potential for SNYLF or YT individuals to disperse into suitable habitat in the vicinity of Waugh Lake, which is within the generally accepted dispersal distance of known populations (i.e., approximately 2 miles for SNYLF (USFWS 2016) and approximately 0.78 mile for YT (USFWS 2016), SNYLF and YT individuals are unlikely to occur in the vicinity of Gem Dam or Rush Creek downstream of Gem Dam.

Under the Proposed Action, long-term operations and maintenance activities would be reduced compared to the existing condition. Following construction activities, Rush Meadows Dam and associated facilities would be removed. The dam and facility sites would be restored and would no longer require operations and maintenance actions. Therefore, there would be no effect to SNYLF or YT individuals in the vicinity of the former Rush Meadows Dam under the Proposed Action. Furthermore, because SNYLF and YT individuals are unlikely to occur in the vicinity of Gem Dam and downstream facilities that would be retained, the Proposed Action would have no effect on SNYLF or YT in these areas.

### *INDIRECT EFFECTS*

Potential indirect effects SNYLF and YT from implementation of operation and maintenance activities to be implemented under the Proposed Action include modification of potential aquatic breeding and non-breeding habitat from changes in operations; and modification of potential upland habitat from operations and maintenance activities. These potential effects are described below.

#### *EFFECTS TO AQUATIC HABITAT*

This section provides an analysis of effects of operation and maintenance activities to be implemented under the Proposed Action on potential aquatic breeding habitat for SNYLF and YT (i.e., wet meadows and ponds), and on potential aquatic non-breeding habitat for SNYLF.

Three wet meadows and three ponds were identified as representing potential aquatic breeding habitat for SNYLF and/or YT during the AQ 7 special-status amphibian studies (SCE 2024c, SD A). All but one of these habitats are hydrologically disconnected from Rush Creek and are outside of areas that would be maintained as part of the Proposed Action, and thus would not be affected by continued operations and maintenance. One meadow (labeled as Meadow 3 on AQ 7 – TSR, Map AQ 7-5e) that represents potentially suitable aquatic breeding habitat for YT is located at the upstream end of Silver Lake. This meadow is hydrologically connected to flows released from Rush Creek Powerhouse. Flows in Rush Creek downstream of Gem Dam would not change under the Proposed Action and MIFs would be maintained at 1 cubic foot per second (cfs) or natural flow. Releases from Rush Creek Powerhouse would also be consistent with the No-Action Alternative. However, with removal of Rush Meadows Dam, there would be an increase in the frequency and magnitude of natural high-flow events in Rush Creek. Natural high-flow releases and spills from Gem Dam into Rush Creek, would also be higher and/or more frequent under the Proposed Action. Under the Proposed Action flow conditions in Rush Creek would be incrementally higher and more similar to the natural hydrograph and unimpaired conditions. Therefore, there would be no effect or a benefit to potential aquatic breeding habitat for SNYLF and YT under the Proposed Action.

All three Project reservoirs, as well as Rush Creek below the reservoirs, are identified in the AQ 7 – TSR (SCE 2024c, SD A) as potential non-breeding aquatic habitat for SNYLF. Under the Proposed Action, operations and maintenance activities would cease following removal of Rush Meadows Dam, and SCE would discontinue MIFs and ramping rates. Natural, unimpaired flows would be re-established in Rush Creek within the lakebed and in Rush Creek downstream of Rush Meadows Dam. Removal of Rush Meadows Dam and Waugh Lake and re-establishment of the historic Rush Creek channel within the lakebed would result in conversion of lacustrine habitat to riverine habitat. Restoration of the natural creek bed and natural hydrology would likely represent a neutral or beneficial change in aquatic non-breeding habitat for SNYLF. However, Rush Creek is expected to maintain current populations of predatory fish, which would continue to compromise suitability of habitat for SNYLF.

Minimum instream flows under the Proposed Action include a continuous minimum flow requirement of 1 cfs (or natural inflow if the level of Gem Lake falls below the face of the dam) in Rush Creek below Gem Dam and 1 cfs (or natural inflow if the level of Gem Lake falls below the face of the dam) below Agnew Lake (natural lake) at the flume gage (USGS 10287289; SCE 357). Refer to Appendix 5-C for a description of the Minimum Instream Flow Measure.

Following removal of Rush Meadows Dam, natural (unimpaired) hydrology would pass through Rush Creek downstream to Gem Lake. Minimum flow requirements below Gem Dam and below Agnew Lake (natural lake) would maintain the same minimum flows that are provided in the No-Action Alternative. However, as described above regarding potential breeding habitat, flow conditions in Rush Creek would be incrementally higher and more similar to the natural hydrograph and unimpaired condition following removal of Rush Meadows Dam. Consequently, the Proposed Action would have no effect or a beneficial effect on potentially suitable habitat in Agnew Lake or Rush Creek below the lake.

Changes in water quality under the Proposed Action could also affect aquatic habitat for SNYLF. Minor changes in Project operations to be implemented under the Proposed Action related to MIF requirements and reservoir level objectives would not affect water quality. Overall water quality in the vicinity of the Project is of high quality (e.g., cold temperatures, high dissolved oxygen, no contaminants) and no Project-related water quality issues were identified during studies conducted as part of relicensing (SCE 2024d). There is some potential for a temporary increase in turbidity and total suspended solids (TSS) following dam removal/retrofit as a result of the newly exposed reservoir beds or inundation zones and increase flows in Rush Creek (upstream of Gem Dam) when compared to existing conditions, particularly in Rush Creek below Rush Meadows Dam, where Rush Creek has a lower gradient and is more susceptible to channel incisement/headcutting. Any increases in turbidity values would be reduced by revegetation and stabilization of the lakebeds and creek channels described in the restoration plans; and would be expected quickly return to normal levels.

Considering that the operation and maintenance activities to be implemented under the Proposed Action would have no effect on wet meadows or ponds representing potential aquatic breeding habitat for SNYLF and YT; that minor changes in operations would have a neutral or slightly beneficial effect to the reservoirs or to Rush Creek, which represent potential aquatic non-breeding habitat for SNYLF; and that any changes in water quality would be minor and temporary, the Proposed Action would have no effect on aquatic habitat for SNYLF and YT.

*EFFECTS TO UPLAND HABITAT*

Upland habitat for SNYLF includes areas that lie within 82 feet of aquatic habitat. As described above, Waugh Lake, Agnew Lake, Gem Lake, and Rush Creek below the associated dams provide potential aquatic non-breeding habitat for SNYLF. Therefore, areas within 82 feet of these features provide potential upland habitat for SNYLF.

Upland habitat for YT includes terrestrial habitats within 0.78 mile of suitable aquatic breeding habitat that provide cover/refugia, dispersal corridors, or foraging/prey resources. Therefore, as identified in the AQ 7 – TSR (SCE 2024c, SD A), areas within 0.78 mile of Ponds 1, 2, and 3; Meadows 1, 3, and 4 provide potential upland habitat for YT.

As previously described in Section 9.2.4, Botanical and Wildlife – Construction Effects, construction is expected to improve upland habitat conditions in the former Waugh and Agnew lakebeds. Under the Proposed Action, long-term maintenance activities would be reduced compared to the No-Action Alternative and would be limited to existing developed facilities in the vicinity of Gem Dam and the Rush Creek Powerhouse. These existing developed areas contain little to no vegetation and surface cover objects that are preferred upland habitat elements for SNYLF and YT. Maintenance activities do not require significant ground disturbance that would result in the removal, collapse, or burial of burrows, logs, rocks, and other habitat elements that provide refugia for YT. Therefore, long-term maintenance activities would have no effect on upland habitat quality for SNYLF and YT.

*Considering the reduction in the maintenance footprint under the Proposed Action; and that ongoing maintenance would be minimal, limited to developed facilities that are mostly devoid of vegetation and other habitat elements utilized by SNYLF or YT in uplands, operation and maintenance activities to be implemented under the Proposed Action would result in* ***no effect*** *or a minor beneficial effect to SNYLF and YT upland habitat.*

## Special-Status Raptors

This section evaluates the potential effects of operation and maintenance activities to be implemented under the Proposed Action on raptors. Two special-status raptors listed under the Bald and Golden Eagle Protection Act (Eagle Act) are known to occur in the analysis area, including the golden eagle (Eagle Act, California Fully Protected [CFP]), and the bald eagle (Eagle Act, FSCC, State Endangered [SE], CFP).

The analysis area contains suitable habitat for five additional special-status raptor species, including northern goshawk (*Accipiter gentilis*) (California Species of Special Concern [CSC]), American peregrine falcon (*Falco peregrinum anatum*) (Bird of Conservation Concern [BCC]), short-eared owl (*Asio flammeus*) (BCC, CSC), long-eared owl (*Asio otus*) (BCC, CSC), and flammulated owl (*Psiloscops flammeolus*) (BCC).

Common raptor species such as osprey and red-tailed hawk may also nest and forage in the analysis area.

Potential direct and indirect effects to raptors from implementation of operation and maintenance activities under the Proposed Action are described below.

#### *DIRECT EFFECTS*

This section evaluates direct effects to raptors from use of helicopters and from ongoing operation and maintenance of Project powerlines.

##### *HELICOPTERS*

Habitats surrounding the analysis area provide suitable nesting and/or foraging habitat for several cliff-nesting and tree-nesting raptors. No active raptor nests have been identified in the analysis area. Raptor nest surveys will be conducted as part of the TERR 2 – Wildlife Resources Technical Study Plan in 2024. These study results will be included in a technical study report included in the Final License Application. In addition, this analysis will be updated based on the results of the study (if appropriate) and included in the Final License Application.

Noise from use of helicopters for maintenance and operations of the Project could disturb active raptor nests and cause nest abandonment, if present. Based on a literature review completed by Anderson (2007) adults were typically flushed from nests only when helicopters approached or hovered for longer periods of time. A sudden or surprise approach may also elicit a stronger response from adult raptors at nests than a gradual approach (White and Sherrod 1973).

Helicopter use for operation and maintenance activities would be limited to infrequent, short flights between the Rush Creek Powerhouse and the Hat Creek landing site (near Gem Dam). In general, helicopter trips are limited to one trip per month (November through April) to complete snow surveys and up to two trips per month (May through October) when maintenance and operations activities are typically conducted.[1]

Disturbance to active raptor nests resulting from use of helicopters would be relatively minimal for several reasons. First, as described above, helicopter use would be limited, and helicopters would fly in a fixed route, avoiding surprise approaches, and would not linger or hover for long periods of time. In addition, SCE would continue to implement the Avian Protection Plan under the Avian Protection Program. The Avian Protection Plan requires SCE to protect nesting birds within activity-specific avoidance buffer zones while operations and maintenance activities are being conducted, including helicopter flights.

[1] Following repair of Project trams, helicopter trips for maintenance activities would no longer be required from May through October.

SCE would also continue to implement the Environmental Training Program. SCE currently implements an Environmental Training Program to educate Licensee personnel and contractors (as appropriate) about special-status biological species, avian protection, nesting birds, and cultural resources in the vicinity of the Project. SCE will include nesting raptors as special-status biological species in the program. The Environmental Training Program will continue to be administered annually.

With limited helicopter use, direct flight paths (avoiding hovering or surprise approaches), continued implementation of the Avian Protection Plan under the Avian Protection Program, and the Environmental Training Program, potential effects to special-status raptors from helicopter use associated with long-term operation and maintenance would be negligible.

*POWERLINES*

Under the No-Action Alternative, there are four Project power lines. Only two of these lines, the 4-kV Agnew Distribution Line and 2.4-kV Switchyard to Powerhouse Distribution Line, would be retained as Project facilities. Based on the results of the powerline evaluation conducted as part of the TERR 2 wildlife studies (TERR 2 – Wildlife TSR [TERR 2 – TSR]) (SCE 2024b, SD A), only the 4-kV Agnew Distribution Line poses a potential risk of electrocution. While no avian mortalities have been documented on this line, there is still some potential for raptors or other birds to be electrocuted. The 2.4-kV Switchyard to Powerhouse Distribution Line is a line only (i.e., does not include any towers/poles) and therefore does not pose risk of electrocution.

As part of SCE's corporate-wide Avian Protection Plan – Power Line Maintenance Program, Project transmission, power, and communication line poles that require maintenance are evaluated for compliance with the Avian Power Line Interaction Committee Guidelines (APLIC 2006, 2012). Designs for powerline and transmission line retrofit/replacement will utilize raptor-safe equipment and pole configurations. In addition, should an avian fatality occur on a Project power line/transmission line, SCE will retrofit the structure to meet avian safe standards.

As described above under helicopter use, other measures to be implemented that would minimize potential direct effects to raptors includes SCE's Environmental Training Program, which includes raptors as special-status species in the program.

Considering that there are no documented avian mortalities, and with implementation of the Avian Protection Plan – Power Line Maintenance Program and Environmental Training Program, effects to raptors resulting from electrocution on Project power lines would be negligible.

### *INDIRECT EFFECTS*

Under the Proposed Action, maintenance activities would be reduced compared to the existing condition. Rush Meadows and Agnew dams and associated facilities would be removed, would no longer require maintenance. Continued maintenance activities implemented at Gem Dam and the Rush Creek Powerhouse complex are limited and restricted to the immediate vicinity of the facilities and would not affect terrestrial habitat for forest- and cliff-nesting raptors.

Changes in operations under the Proposed Action could potentially affect aquatic foraging habitat for bald eagles or osprey. Under the Proposed Action, operations and maintenance activities would cease following removal of Rush Meadows Dam and Waugh Lake and SCE would discontinue MIFs and ramping rates. Natural, unimpaired flows would be re-established in Rush Creek within the lakebed and in Rush Creek downstream of Rush Meadows Dam. Removal of Rush Meadows Dam and Waugh Lake and re-establishment of the historic Rush Creek channel within the lakebed would result in a change in the type of foraging habitat available for bald eagle and osprey (conversion of lake foraging habitat to riverine foraging habitat), however this change in habitat would maintain prey abundance and availability (i.e., fish populations) for foraging bald eagle and osprey.

Minimum instream flows under the Proposed Action include a continuous minimum flow requirement of 1 cfs (or natural inflow if the level of Gem Lake falls below the face of the dam) in Rush Creek below Gem Dam and 1 cfs (or natural inflow if the level of Gem Lake falls below the face of the dam) below Agnew Lake (natural lake) at the flume gage (USGS 10287289; SCE 357). Refer to Appendix 5-C for a description of the Minimum Instream Flow Measure.

Following removal of Rush Meadows Dam, natural (unimpaired) hydrology would pass through Rush Creek downstream to Gem Lake. Minimum flow requirements below Gem Dam and below Agnew Lake (natural lake) would maintain the same minimum flows that are provided in the No-Action Alternative. Consequently, the Proposed Action would have no effect on reservoir fish habitat in Agnew Lake and prey availability for bald eagle and osprey.

Under the Proposed Action, SCE would retrofit Gem Dam to facilitate compliance with seismic restrictions. Maximum reservoir elevations would be consistent with No-Action Alternative (9,027.5 feet). Gem Lake reservoir elevations would be maintained as described in the Recreation Reservoir Elevation Objectives Measure (Section 5, Appendix 5-C), which states that SCE will make every reasonable effort the achieve the specified reservoir water surface elevation objectives between July 1 and the Tuesday following Labor Day between 5 and 15 feet from the spillway elevation depending on the April 1 snow water equivalent percentage at Agnew Pass. While the reservoir elevations are slightly modified under the Proposed Action, fish populations in Gem Lake would be maintained for foraging bald eagle and osprey.

However, with removal of Rush Meadows Dam, there would be an increase in the frequency and magnitude of natural high-flow events in Rush Creek. Natural high-flow releases and spills from Gem Dam into Rush Creek, would also be higher and/or more frequent under the Proposed Action. Under the Proposed Action flow conditions in Rush Creek would be incrementally higher and more similar to the natural hydrograph and unimpaired conditions. These modifications in flow would not affect the availability of prey species or foraging habitat.

SCE would also continue to stock fish at Silver Lake as described in Appendix 5-C. Fish stocking would maintain prey available for bald eagles and osprey within the lake.

Changes in water quality under the Proposed Action could also affect aquatic foraging habitat for raptors. As described previously, overall water quality in the vicinity of the Project is of high quality and minor changes in Project operations to be implemented under the Proposed Action related to MIF requirements and reservoir level objectives would not affect water quality. There is some potential for a temporary increase in turbidity and TSS following dam removal in Rush Creek below Rush Meadows Dam. However, any increases in turbidity values would be minor, and reduced by revegetation and stabilization of the lakebeds and creek channel described in the restoration plans; and would be expected to return to normal levels quickly.

Therefore, changes in Project operations would maintain aquatic foraging habitat and prey availability for bald eagle and osprey.

**Other Special-Status Birds and Game Birds**

In addition to raptors, the Proposed Action may also affect other special-status birds and game birds. Three special-status birds were observed during implementation of the TERR 2 reconnaissance surveys (SCE 2024b, SD A), calliope hummingbird (*Selasphorus calliope*) (Bird of Conservation Concern [BCC]), yellow warbler (*Setophaga petechia*) (CSC) and Cassin's finch (*Haemorhous cassinii*) (BCC). Suitable habitat for four additional bird species, including black swift (*Cypesloides niger*) (BCC, CSC), Lewis's woodpecker (*Melanerpes lewis*) (BCC), little willow flycatcher (*Empidonax traillii brewsteri*) (FSCC, SE), and olive-sided flycatcher (*Contopus cooperi*) (BCC, CSC) are also present in the area where operations and maintenance would occur for the Proposed Action.

Game birds potentially present in the analysis area include resident game birds (e.g., mountain qual [*Oreotyx pictus*] and California quail [*Callipepla californica*), and migratory game birds (e.g., mallard [*Anas platyrhynchos*] and American coot [*Fulica americana*]). Refer to Section 8.5. Table 8.5.6 for a complete list of resident and migratory game birds.

Provided below is a discussion of potential direct and indirect effects to special-status birds and game birds resulting from implementation of operation and maintenance activities under the Proposed Action.

### *DIRECT EFFECTS*

Vegetation management under the Proposed Action is limited to trimming by hand and herbicide application in the direct vicinity of Gem Dam, Rush Creek Powerhouse, and associated facilities. Herbicides are only used on SCE lands near the Rush Creek Powerhouse. These areas are mostly barren or support patchy herbaceous or low-growing shrub vegetation. Riparian habitat is present in two areas where vegetation is trimmed by hand as part of the Proposed Action. This includes a small area under the 4-kV Agnew Distribution Line and long the Rush Creek Powerhouse Complex Access Road and associated bridges over the Rush Creek Powerhouse Tailrace and Rush Creek. Vegetation trimming in these areas is focused on trimming of tall, woody vegetation that may come in contact with the distribution line or impede access on the Rush Creek Powerhouse Access Road. All other areas where vegetation management is implemented support herbaceous vegetation (including non-native grasses) and low-growing shrubs.

Herbicides would also continue to be applied under the supervision of a PCA and consistent with label instruction (application methods, protective buffers for aquatic habitats) within the Rush Creek Powerhouse Complex. Best Management Practices will be implemented to minimize the potential for spills, establish transport and storage protocols, and reduce the overall risk of potential effects.

To avoid potential impacts to active nests from vegetation management, SCE will continue to implement the Avian Protection Plan, which is part of the SCE-wide Avian Protection Program. The Avian Protection Plan requires SCE to protect nesting birds within activity-specific avoidance buffer zones while operations and maintenance activities are being conducted. SCE’s Environmental Screening Program requires an inspection to be conducted prior ground disturbance or vegetation management in areas that may potentially support sensitive species (including nesting birds). If nests are identified, a protective buffer is established, and work is not implemented until after they young have fledged the nest.

SCE would also continue to apply herbicides under the supervision of a PCA and consistent with label instruction and implement the Environmental Training Program. SCE currently implements an Environmental Training Program to educate Licensee personnel and contractors (as appropriate) about special-status biological species, avian protection, nesting birds, and cultural resources in the vicinity of the Project. SCE will include other special-status birds as special-status biological species in the program. The Environmental Training Program will continue to be administered annually.

With continued implementation of the Avian Protection Plan and Avian Protection Program, Environmental Screening Program, application of herbicide by a PCA consistent with label instruction, and implementation of the Environmental Training Program, potential effects to other special-status birds and game birds from long-term maintenance would be negligible.

#### *Indirect Effects*

Implementation of the Proposed Action could potentially affect special-status birds through changes in the quantity or quality of vegetation and nesting habitat.

As described above, under the Proposed Action, long-term operations and maintenance activities would be reduced compared to the existing condition. Following construction activities Rush Meadows and Agnew dams and associated facilities would be removed, would no longer require operation or maintenance actions, and the dam and facility sites would be restored. The reduction of maintenance and restoration of the former lakebeds and upland facility sites would result in a potential increase in habitat quality and quantity as vegetation regrows in these areas over time. In addition, the reduction in maintenance is expected to result in an overall decrease in the potential introduction or spread of NNIPs that could potentially degrade habitat for other special-status birds. Refer to Section 9.2.4, Botanical and Wildlife – Construction Effects for a detailed analysis of potential construction-related effects, including restoration, on other special-status birds and game birds.

Under the Proposed Action, SCE would continue to conduct vegetation management around existing Project facilities maintained as part of the Proposed Action. Vegetation trimming is restricted to the amount necessary to provide for safety and access to Project facilities and would not result in a change in the overall nesting habitat available for other special-status birds and game birds on the landscape scale.

Changes in operations could potentially affect riparian habitat for riparian-nesting birds. Under the Proposed Action, SCE would maintain the existing MIF of 1 cfs or natural flow in Rush Creek. Following removal of Rush Meadows Dam, natural (unimpaired) hydrology would pass through Rush Creek downstream to Gem Lake, which would benefit riparian habitats through restoring natural scour and recruitment dynamics. Riparian habitat may therefore increase in quantity and quality following implementation of the Proposed Action along Rush Creek, benefitting nesting habitats for riparian-nesting birds. Minimum flow requirements below Gem Dam and below Agnew Lake (natural lake) would maintain the same minimum flows that are provided in the No-Action Alternative. However, with removal of Rush Meadows Dam, there would be an increase in the frequency and magnitude of natural high-flow events in Rush Creek, and natural high-flow releases and spills from Gem Dam into Rush Creek would be higher and more frequent under the Proposed Action, and more similar to natural unimpaired conditions. This is anticipated to have a neutral to beneficial effect on riparian habitats. Therefore, changes in operations under the Proposed Action would have a neutral to beneficial effect on riparian nesting bird habitat. Refer to Section 9.3.7 – Wetland, Riparian, and Littoral Habitat Operation and Maintenance Effects for a detailed discussion of potential effects to riparian habitat.

Because potential nesting habitat is limited in vegetation management areas, operations of the Proposed Action would not result in changes in habitat, with the overall reduction in operation and maintenance activities and restoration, and continued implementation of SCE's Avian Protection Program, impacts to other special-status birds and game birds would be negligible. Over the long-term, the Proposed Action would potentially benefit other special-status birds and game birds through the increased habitat quality and quantity.

## Special-Status Bats

Several special-status bat species considered sensitive by the State of California have the potential to roost in the analysis area, including pallid bat (*Antrozous pallidus*) (CSC), Townsend's big-eared bat (*Corynorhinus townsendii*) (CSC), and spotted bat (*Euderma maculatum*) (CSC). The analysis area also represents suitable roosting habitat for common bat species.

Provided below is an evaluation of potential direct and indirect effects of operation and maintenance activities to be implemented under the Proposed Action on special-status bats.

### *DIRECT EFFECTS*

Under the Proposed Action, SCE would continue to operate and maintain facilities identified as potentially containing suitable roosting habitat for bats in the TERR 2 – TSR (SCE 2024b, SD A). This includes Gem Dam and several associated facilities, Agnew Lake facilities that would be retained, and facilities within the Rush Creek Powerhouse Complex. Special-status bat roosts could potentially be disturbed by long-term maintenance activities, if present in Project facilities. If a Project facility contains a maternity roost, facility maintenance may cause an abandonment of non-volant young. Surveys are planned for the summer and fall of 2024 (including seasonal use acoustic surveys) to determine the presence of bat roosts in Project facilities. These results will be included in a technical study report included in the Final License Application. In addition, this analysis will be updated based on the results of the study (if appropriate) and included in the Final License Application.

Other measures to be implemented that would minimize potential direct effects to special-status bat roosts includes SCE's Environmental Training Program. This program educates all staff and contractors working on SCE projects on applicable environmental laws and regulations, what to do if sensitive resources (including special-status bats) are found in work areas, and avoidance and protection measures.

### *INDIRECT EFFECTS*

The Proposed Action could potentially affect bats, if changes in operations resulted in effects to aquatic foraging habitat and prey abundance within these habitats.

Under the Proposed Action, operations and maintenance activities would cease following removal of Rush Meadows Dam and Waugh Lake and SCE would discontinue MIFs and ramping rates. Natural, unimpaired flows would be re-established in Rush Creek within the lakebed and in Rush Creek downstream of Rush Meadows Dam. Removal of Rush Meadows Dam and Waugh Lake and re-establishment of the historic Rush Creek channel within the lakebed would result in a change in the type of foraging habitat available for special-status bats (conversion of lake foraging habitat to riverine habitat). This change in habitat is expected to maintain the abundance and availability of aquatic macroinvertebrates that represent prey species for foraging bats. As described in Section 9.2.4, Botanical and Wildlife – Construction Effects, the former lakebed, once restored, would support an increased diversity of habitats, including both aquatic and upland habitats that may provide foraging opportunities for bats.

Under the No-Action Alternative, Agnew Lake no longer stores water, and a pre-Project natural lake is present (maximum elevation of 8,470 feet). Water entering Agnew Lake passes through the two notches in the bottom of the dam and flows downstream into Rush Creek. Under the Proposed Action, the center three arches would be removed, and the natural lake would be retained. Consequently, the Proposed Action would have no effect on aquatic macroinvertebrate populations in Agnew Lake and prey availability for special-status bats.

Under the Proposed Action, SCE would retrofit Gem Dam to facilitate compliance with seismic restrictions. Maximum reservoir elevations would be consistent with No-Action Alternative (9,027.5 feet). Gem Lake reservoir elevations would be maintained as described in the Recreation Reservoir Elevation Objectives Measure (Appendix 5-C), which states that SCE will make every reasonable effort to achieve the specified reservoir water surface elevation objectives between July 1 and the Tuesday following Labor Day between 5 and 15 feet from the spillway elevation depending on the April 1 snow water equivalent percentage at Agnew Pass. While the reservoir elevations are slightly modified under the Proposed Action, aquatic macroinvertebrates populations would be maintained for foraging special-status bats.

SCE would maintain a MIF of 1 cfs or natural flow downstream of Gem Dam. Following retrofit, there would be a minor increase in high flows under the Proposed Action compared to the No-Action Alternative, but the increase would not affect the availability of prey species or foraging habitat for special-status bats.

Changes in water quality under the Proposed Action could also affect aquatic foraging habitat for special-status bats. As described previously, overall water quality in the vicinity of the Project is of high-quality minor changes in Project operations to be implemented under the Proposed Action related to MIF requirements and reservoir level objectives would not affect water quality. There is some potential for a temporary increase in turbidity and TSS following dam removal in Rush Creek below Rush Meadows Dam. However, any increases in turbidity values would be minor, and reduced by revegetation and stabilization of the lakebeds and creek channels described in the restoration plans; and would be expected to return to normal levels quickly.

Therefore, changes in Project operations would maintain and potentially increase foraging habitat quality and prey availability for special-status bats. Because aquatic macroinvertebrate populations would be maintained and potentially increased, effects to special status bats from long-term operations would be negligible and/or beneficial.

### Special-Status Mammals

No special-status mammals were observed within the analysis area during implementation of the TERR 2 wildlife studies (SCE 2024b, SD A). However, based on wildlife habitats present, records of known occurrences, and consultation with resource agencies, three ESA-listed special-status mammals may potentially occur in the analysis area, including Sierra Nevada bighorn sheep (*Ovis canadensis sierrae*) (FE, SE, CFP), the Sierra Nevada red fox (*Vulpes vulpes necator*) (Sierra Nevada DPS) (FE, State Threatened [ST]), and the North American wolverine (*Gulo gulo luscus*) (Contiguous United States DPS) (FT, ST, CFP).

Critical Habitat Unit 2 (Mount Gibbs) for Sierra Nevada bighorn sheep is present north of the analysis area (within 1.2 mile of the FERC Project boundary). Refer to Section 8.5, Map 8.5-6 for the location of Critical Habitat for Sierra Nevada bighorn sheep. Based on discussions with CDFW, bighorn sheep have never been recorded within the analysis area and are unlikely to move into the FERC Project boundary (Lacey Green, pers. comm). This species primarily utilizes habitats north of the FERC Project boundary.

Six other special-status wildlife have the potential to occur in the analysis area, including Sierra Nevada snowshoe hare (*Lepus americanus tahoensis*) (CSC), western white-tailed jackrabbit (*Lepus townsendii townsendii*) (CSC), Sierra marten (*Martes caurina sierrae*) (FSCC), American badger (*Taxidea taxus*) (CSC), and ringtail (*Bassariscus astutus*) (CFP). In addition, the analysis area also contains suitable habitat for a variety of game mammals, as defined in Section 8.5, Table 8.5-6.

Provided below is an analysis of potential direct and indirect effects to special-status and game mammals.

#### *SIERRA NEVADA BIGHORN SHEEP*

##### *DIRECT EFFECTS*

Critical Habitat Unit 2 (Mount Gibbs) for Sierra Nevada bighorn sheep is present north of the analysis area (within 1.2 mile of the FERC Project boundary). Refer to Section 8.5, Map 8.5-6 for the location of Critical Habitat for Sierra Nevada bighorn sheep. Based on discussions with CDFW, bighorn sheep have never been recorded within the analysis area and are unlikely to move into the FERC Project boundary (Lacey Green, pers. comm). This species primarily utilizes habitats north of the FERC Project boundary.

Helicopters would continue to be used, as needed, to support the operation and maintenance of the Project. Noise and disturbance from helicopters have been demonstrated to affect bighorn sheep distribution, movement patterns, habitat use, and foraging behavior (Anderson 2007; Bleich et al. 1990; Bleich et al. 1994; Stockwell et al. 1991). Use of helicopters for operations and maintenance activities under the Proposed Action could, therefore, potentially result in direct disturbance effects to Sierra Nevada bighorn sheep and other large special-status and game mammals, if present in the vicinity of the flight paths.

Use of helicopters is unlikely to disturb bighorn sheep movement patterns and foraging or disturb other mammals in the analysis area for several reasons. First, helicopter use would be limited to infrequent, short flights between the Rush Creek Powerhouse and the Hat Creek landing site (near Gem Dam). In general, helicopter trips are limited to one trip per month (November through April) for snow surveys and up to two trips per month (May through October) when maintenance and operations activities are typically conducted.[1] Flight paths have been selected in consultation with USFWS to avoid Sierra Nevada bighorn sheep critical habitat (SCE 2017); and helicopters would fly in a fixed route and would not linger or hover for long periods of time.

Considering that helicopter flights would be infrequent, would follow a direct route between Rush Creek Powerhouse and the Hat Creek landing sites, and are routed to avoid Critical Habitat, ongoing operation and maintenance activities may affect, but are not likely to adversely affect Sierra Nevada bighorn sheep.

*INDIRECT EFFECTS*

As described previously, the analysis area is located on lands currently that are not utilized by Sierra Nevada bighorn sheep. Therefore, ongoing operations and maintenance will have no effect on Sierra Nevada bighorn sheep by affecting their habitats.

*Considering direct and indirect effects described above, ongoing operation and maintenance of the Project* ***may affect, but will not likely adversely affect*** *Sierra Nevada bighorn sheep. Over the long-term, the removal of Project facilities and associated restoration would result in an overall* ***benefit*** *to the species.*

***SIERRA NEVADA RED FOX***

*DIRECT EFFECTS*

Helicopters would continue to be used, as needed, to support the operation and maintenance of the Project. Use of helicopters for operations and maintenance activities under the Proposed Action could potentially flush individuals if present near landing sites.

Helicopter use would be limited to infrequent, short flights between the Rush Creek Powerhouse and the Hat Creek landing site (near Gem Dam). In general, helicopter trips are limited to one trip per month (November through April) for snow surveys and up to two trips per month (May through October) when maintenance and operations activities are typically conducted.

Considering that helicopter flights would be infrequent, would follow a direct route between Rush Creek Powerhouse and the Hat Creek landing sites, ongoing operation and maintenance activities may affect, but are not likely to adversely affect Sierra Nevada red fox.

*INDIRECT EFFECTS*

As described above, under the Proposed Action, long-term operations and maintenance activities would be reduced compared to the existing condition. Following construction activities Rush Meadows and Agnew dams and associated facilities would be removed, would no longer require operation or maintenance actions (including routine helicopter flights), and the dam and facility sites would be restored. The reduction of maintenance and restoration of the former lakebeds and upland facility sites would result in a potential increase in habitat available for Sierra Nevada red fox overtime. In addition, the reduction in maintenance and operations is expected to result in an overall decrease in the potential introduction or spread of NNIPs that could potentially degrade habitat for these species. Therefore, in the long-term the Proposed Action is expected to benefit Sierra Nevada red fox through increased quality and quantity of available habitat. Refer to Section 9.2.4, Botanical and Wildlife – Construction Effects for a detailed analysis of potential construction-related effects, including restoration, on Sierra Nevada red fox.

*Considering direct and indirect effects described above, ongoing operation and maintenance of the Project **may affect, but will not likely adversely affect** Sierra Nevada red fox. Over the long-term, the removal of Project facilities and associated restoration would result in an overall **benefit** to the species.*

***NORTH AMERICAN WOLVERINE***

*DIRECT EFFECTS*

Helicopters would continue to be used, as needed, to support the operation and maintenance of the Project. Use of helicopters for operations and maintenance activities under the Proposed Action could potentially flush individual wolverine, if present near landing sites.

As described above helicopter flights would be infrequent, would follow a direct route between Rush Creek Powerhouse and the Hat Creek landing sites. Therefore, ongoing helicopter use as part of operation and maintenance activities may affect, but are not likely to adversely affect wolverine.

*INDIRECT EFFECTS*

As described above, under the Proposed Action, long-term operations and maintenance activities would be reduced compared to the existing condition. Following construction activities Rush Meadows and Agnew dams and associated facilities would be removed, would no longer require operation or maintenance actions (including routine helicopter flights), and the dam and facility sites would be restored. The reduction of maintenance and restoration of the former lakebeds and upland facility sites would result in a potential increase in habitat available for wolverine overtime. In addition, the reduction in maintenance and operations is expected to result in an overall decrease in the potential introduction or spread of NNIPs that could potentially degrade habitat for these species. Therefore, in the long-term the Proposed Action is expected to benefit wolverine through increased quality and quantity of available habitat. Refer to Section 9.2.4, Botanical and

Wildlife – Construction Effects for a detailed analysis of potential construction-related effects, including restoration, on wolverine.

*Considering direct and indirect effects described above, ongoing operation and maintenance of the Project* ***may affect, but will not likely adversely affect*** *wolverine. Over the long-term, the removal of Project facilities and associated restoration would result in an overall* ***benefit*** *to the species.*

#### *OTHER SPECIAL-STATUS MAMMALS AND GAME MAMMALS*

Other special-status mammals that may potentially occur in the Project area include Sierra Nevada snowshoe hare (*Lepus americanus tahoensis*), western white-tailed jackrabbit (*Lepus townsendii townsendii*), Sierra Nevada mountain beaver (*Aplodontia rufa californica*), Sierra martin (*Martes caurina sierrae*), American badger (*Taxidea taxus*), and ringtail (*Bassariscus astutus*). In addition, the analysis area also contains suitable habitat for a variety of game mammals (e.g., gray fox [*Urocyon cinereoargenteus*], black bear [*Ursus americanus*]), as defined in Section 8.5, Table 8.5-6.

##### *DIRECT EFFECTS*

Helicopters would continue to be used, as needed, to support the operation and maintenance of the Project. Use of helicopters for operations and maintenance activities under the Proposed Action could potentially flush other mammals and game mammals, if present near landing sites.

As described above helicopter flights would be infrequent, would follow a direct route between Rush Creek Powerhouse and the Hat Creek landing sites. Therefore, ongoing helicopter use as part of operation and maintenance activities would have a negligible effect on other special-status mammals and game mammals.

##### *INDIRECT EFFECTS*

As described above, under the Proposed Action, long-term operations and maintenance activities would be reduced compared to the existing condition. Following construction activities Rush Meadows and Agnew dams and associated facilities would be removed, would no longer require operation or maintenance actions (including routine helicopter flights), and the dam and facility sites would be restored. The reduction of maintenance and restoration of the former lakebeds and upland facility sites would result in a potential increase in habitat available for special-status and game mammals overtime. In addition, the reduction in maintenance and operations is expected to result in an overall decrease in the potential introduction or spread of NNIPs that could potentially degrade habitat for these species. Therefore, in the long-term the Proposed Action is expected to benefit wolverine through increased quality and quantity of available habitat. Refer to Section 9.2.4, Botanical and Wildlife – Construction Effects for a detailed analysis of potential construction-related effects, including restoration, on special-status and game mammals.

Considering direct and indirect effects described above, ongoing operation and maintenance of the Project would have a negligible effect on other special-status mammals and game mammals. Over the long-term, the removal of Project facilities and associated restoration would result in an overall benefit to these species.

#### 9.3.4.3 Environmental Measures

Implementation of operation and maintenance activities under the Proposed Action would have negligible effects on botanical and wildlife resources with implementation of the Vegetation Management Measures (Appendix 5-C).

#### 9.3.4.4 Unavoidable Adverse Effects

There are no unavoidable adverse effects to botanical and wildlife resources from continued operation and maintenance of the Project under the Proposed Action.

#### 9.3.4.5 References

Anderson, B.A. 2007. A Literature Review of the Effects of Helicopter Disturbance and Noise on Selected Wildlife Species.

APLIC (Avian Power Line Interaction Committee). 2006. Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006. Edison Electric Institute, APLIC, and the California Energy Commission. Washington, DC, and Sacramento, California.

———. 2012. Reducing Avian Collisions with Power Lines: The State of the Art in 2012. Edison Electric Institute, APLIC, and the California Energy Commission. Washington, DC, and Sacramento, California.

Bleich, V.C., R.T. Bowyer, A.M. Pauli, R.L. Vernoy, and R.W. Anthes. 1990. Responses of mountain sheep to aerial sampling using helicopters. California Fish and Game, 76(4).

Bleich, V.C., R.T. Bowyer, A.M. Pauli, M.C. Nicholson, and R.W. Anthes. 1994. Mountain sheep *Ovis canadensis* and helicopter surveys: Ramifications for the conservation of large mammals. Biological Conservation, 70(1), 1-7.

SCE (Southern California Edison Company). 2017. Biological Assessment and Biological Evaluation, Rush Meadows Dam Modifications, Rush Creek Hydroelectric System Runoff Management Project. December 2017.

———. 2024a. Draft TERR 1 – Botanical Resources Technical Study Report. August. Available in Supporting Document A of the Application for New License.

———. 2024b. Draft TERR 1 – Wildlife Resources Technical Study Report. August. Available in Supporting Document A of the Application for New License.

———. 2024c. Draft AQ 7 – Special-Status Amphibians Technical Study Report. August. Available in Supporting Document A of the Application for New License.

———. 2024d. Draft AQ 4 – Water Quality Technical Study Report. August. Available in Supporting Document A of the Application for New License.

Stockwell, C.A., G.C. Bateman and J. Berger. 1991. Conflicts in National Parks: A case study of helicopters and bighorn sheep at Grand Canyon. Biological Conservation 56:317-328.

USFWS (United States Fish and Wildlife Service). 2016. Designation of Critical Habitat for the Sierra Nevada Yellow-Legged Frog, the Northern Distinct Population Segment of the Mountain Yellow-Legged Frog, and the Yosemite Toad; Final Rule (FR, Vol. 81, No. 166, Pages 59046–59119), August 26, 2016.

White, C.M., and S.K. Sherrod. 1973. Advantages and Disadvantages of the Use of Rotor-Winged Aircraft in Raptor Surveys. Raptor Research, Vol 7 (3/4), pp 97–104.

## TABLE OF CONTENTS

Page

9.3.5 Geology and Soils – Operation and Maintenance Effects .......................... 9.3.5-1
9.3.5.1 Potential Effects from Erosion and Sediment Transport in the Former Waugh and Agnew Lakebeds ................................................ 9.3.5-1
9.3.5.2 Potential Effects from Erosion in the Former Gem Lake Inundation Zone ........................................................................................ 9.3.5-2
9.3.5.3 Potential Effects from Ongoing Project Maintenance ......................... 9.3.5-2
9.3.5.4 Environmental Measures ................................................................ 9.3.5-3
9.3.5.5 Unavoidable Adverse Effects ........................................................... 9.3.5-3

## LIST OF ACRONYMS

| | |
|---|---|
| Project | Rush Creek Project |
| SCE | Southern California Edison Company |

### 9.3.5 Geology and Soils – Operation and Maintenance Effects

This section describes the potential effects to geology and soils that could occur because of continued operation and maintenance activities to be implemented under the Proposed Action for Southern California Edison Company's (SCE) Rush Creek Project (Project). A description of operation and maintenance activities to be implemented under the Proposed Action is included in Section 5.

For purposes of addressing soil effects, this section considers only the potential for erosion outside of the Rush Creek channel and channel banks. In-channel and streambank operations effects are discussed in Section 9.3.6, Geomorphology – Operation and Maintenance Effects.

Potential effects are determined by analyzing the changes in geology and soils that may result from activities to be implemented under the Proposed Action compared to the No-Action Alternative (existing condition) (Section 4). Final effects determinations consider environmental measures, management, and monitoring plans (environmental measures) to be included under the Proposed Action (refer to Section 5, Appendix 5-B). Unavoidable adverse effects are discussed at the end of this section.

The following potential effects to geology and soils because of continued operation and maintenance activities were evaluated:

- Potential effects from erosion and sediment transport in the former Waugh and Agnew lakebeds.
- Potential effects from erosion in the former Gem Lake inundation zone.
- Potential effects from ongoing maintenance that could result in soil contamination and instability (vegetation management and trail maintenance).

This section relies on data collected as part of the AQ 5 – Geomorphology Technical Study Plan.

#### 9.3.5.1 Potential Effects from Erosion and Sediment Transport in the Former Waugh and Agnew Lakebeds

Under the No-Action Alternative, since 2012, Waugh Lake has been limited to an elevation of 9,392.1 feet to meet seismic restrictions and alleviate safety concerns, resulting in a 130-acre reservoir with a storage capacity of 1,555 feet. Since 2013, under the Federal Energy Regulatory Commission-mandated storage restrictions, only a small natural lake (23 acres; 569 acre-feet), that pre-dates the Project, exists upstream of Agnew Dam. Because of the seismic restrictions, the former lakebeds of Waugh and Agnew lakes are exposed.

Under the Proposed Action, removal of Rush Meadows and Agnew dams such that water is no longer impounded, would further expose the lakebeds increasing the susceptibility of soils to wind and water erosion. Rilling and gullying of deposited lakebed sediments was observed in the field and is likely to continue on a long-term basis throughout the former reservoir footprints. Field observations also show that there is natural regeneration of vegetation occurring on the formerly inundated surfaces in the Waugh lakebed that were exposed following imposition of the seismic restrictions. This revegetation process is likely to continue, which will help minimize exposed lakebed deposit erosion. In addition to natural processes, site-specific restoration plans will be implemented following removal of Rush Meadows and Agnew dams to reduce the potential for erosion and sedimentation. The objectives of the restoration plans include revegetation and stabilization of sediment in the former Waugh and Agnew lakebeds, reestablishment and stabilization of Rush Creek within the former Waugh and Agnew lakebeds, and restoration of upland, riparian, and wetland vegetation in the former Waugh lakebed (refer to Section 9.2.5, Geology and Soils – Construction Effects).

Implementation of a site-specific restoration plan would protect soil resources and minimize erosion and sediment transport in Waugh and Agnew lakebeds over the term of the new license by facilitating the former lakebed's return to a natural state; therefore, impacts are considered negligible.

#### 9.3.5.2 Potential Effects from Erosion in the Former Gem Lake Inundation Zone

Under the No-Action Alternative, Gem Lake is maintained at a seismic restricted elevation of 9,027.5 feet and the former inundation zone of Gem Lake is exposed. Following dam retrofitting (reduced dam height and modified spillway), the reservoir would continue to be maintained at the seismic restricted elevation (9,027.5 feet). While there is no change in maximum reservoir elevation between the existing condition and Proposed Action, the former inundation zone of Gem Lake is still present and exposed shoreline sediments would continue to be susceptible to wind and water erosion. To reduce the potential for erosion, SCE will implement a site-specific restoration plan following retrofitting of Gem Dam, which will include revegetation and stabilization of sediment in the former Gem Lake inundation zone.

Implementation of a site-specific restoration plan would protect soil resources and minimize erosion in the former inundation zone of Gem Lake over the term of the new license; therefore, impacts are considered negligible.

#### 9.3.5.3 Potential Effects from Ongoing Project Maintenance

As part of routine maintenance of the Project, SCE implements vegetation management (herbicide use) which could result in soil contamination, and Project access trail maintenance which would result in erosion. Under the Proposed Action, these routine maintenance activities would continue to be implemented as described under the No-Action Alternative (i.e., no change). Namely, herbicides would continue to be applied inside the powerhouse substation perimeter fence and 10 to 15 feet outside the fence to control weeds and vegetation encroachment. They are applied using a small handheld sprayer in accordance with label instructions by a licensed vendor on SCE-owned lands. Project access trails would continue to be regularly inspected during normal Project activities. Repairs would be conducted on an as-needed basis and generally include debris and rock removal; vegetation management; minor brushing; installation of access control structures such as barrier rock; and repair/replacement of signage.

Under the Proposed Action, herbicides would continue to be applied by a licensed vendor consistent with label instruction, and best management practices to prevent erosion during trail maintenance would continue to be implemented. Therefore, no effects to geology and soils are anticipated.

#### 9.3.5.4 Environmental Measures

Implementation of operation and maintenance activities under the Proposed Action would have a negligible effect on geology and soils; therefore, no environmental measures are proposed.

#### 9.3.5.5 Unavoidable Adverse Effects

There are no unavoidable adverse effects to geology and soils from continued operation and maintenance of the Project under the Proposed Action.

## TABLE OF CONTENTS

Page

9.3.6 Geomorphology – Operation and Maintenance Effects ............................. 9.3.6-1
9.3.6.1 Sediment Release from Waugh and Agnew Reservoirs and Alteration of Rush Creek Channel Geometry Following Dam Removal ............................. 9.3.6-1
9.3.6.2 Potential Effects to Sediment Transport and Channel Morphology Due to Increases in Flow Magnitude and Duration ............................. 9.3.6-3
9.3.6.3 Potential Effects to the Supply and Transport of Large Woody Debris Due to Increased High Flows ............................. 9.3.6-4
9.3.6.4 Environmental Measures ............................. 9.3.6-6
9.3.6.5 Unavoidable Adverse Effects ............................. 9.3.6-6
9.3.6.6 References ............................. 9.3.6-6

## LIST OF TABLES

Table 9.3.6-1. Average Number of Days per Year the Rush Creek 1.5-year Flow Recurrence Equaled or Exceeded for Unimpaired and Impaired Hydrologic Regimes ............................. 9.3.6-8

## LIST OF ACRONYMS

| | |
|---|---|
| LWD | large woody debris |
| Project | Rush Creek Project |
| SCE | Southern California Edison Company |
| TSR | Technical Study Report |

### 9.3.6 Geomorphology – Operation and Maintenance Effects

This section describes the potential effects to geomorphology that could occur because of continued operation and maintenance activities to be implemented under the Proposed Action for Southern California Edison Company's (SCE) Rush Creek Project (Project). A description of operation and maintenance activities to be implemented under the Proposed Action is included in Section 5.

Potential effects are determined by analyzing the changes in geomorphology that may result from activities to be implemented under the Proposed Action compared to the No-Action Alternative (existing condition) (Section 4). Final effects determinations consider environmental measures, management, and monitoring plans (environmental measures) to be included under the Proposed Action (refer to Section 5, Appendix 5-C). Unavoidable adverse effects are discussed at the end of this section.

The following potential effects to geomorphology because of continued operation and maintenance activities were evaluated:

- Potential effects from sediment release from Waugh and Agnew reservoirs due to dam removal, causing upstream headcutting into reservoir bed material.
- Potential effects to sediment transport and channel morphology in Rush Creek reaches, downstream of Rush Meadows Dam, Gem Dam, and Agnew Dam (also including South Rush Creek reach), due to change in geomorphically effective flow magnitude and duration.
- Potential effects to the supply and transport of large woody debris due to increased high flows.

This section relies on information obtained during geomorphology studies conducted in 2023 as part of relicensing (SCE 2024a). Components of the Federal Energy Regulatory Commission approved technical study plan were unable to be completed in 2023 and will be conducted in 2024. Results from 2024 studies will be provided in an updated technical study report to be included in the Final License Application. In addition, this analysis will be updated, as appropriate, in the Final License Application.

#### 9.3.6.1 Sediment Release from Waugh and Agnew Reservoirs and Alteration of Rush Creek Channel Geometry Following Dam Removal

Under the Proposed Action, Rush Meadows and Agnew dams would be removed and Gem Dam would be retrofitted to facilitate compliance with the seismic restrictions under a probable maximum flood event with a new spillway and reduced dam height. In addition, site-specific restoration plans would be developed and implemented following construction. The plans will include restoration of construction work areas, staging areas, access routes, campsites, and areas where facilities have been removed; stabilization of areas upstream and downstream of the remaining portions of the dams to prevent erosion; revegetation and stabilization of sediment in the former lakebeds; and reestablishment and stabilization of the historic creek channel (Rush Creek) within the lakebeds, as necessary.

Project facility modification and restoration activities to be implemented under the Proposed Action could result in changes to hydrology that affect geomorphology over the term of the new license. Project facility modification and restoration activities are summarized in Section 9.2.6, Geomorphology – Construction Effects and details are available in Appendix 5-A.

**Rush Meadows Dam Removal**

Under the Proposed Action, Rush Meadows Dam would be removed to an elevation of approximately 9,378 feet (subject to a final design that reflects refined hydraulic calculations and topographic information) (Section 5, Figure 5-1; Appendix 5-A). Dam removal could lower the base level of Rush Creek at the outlet elevation of the deconstructed dam. Currently, the base level is the low-level outlets that remain open year-round. Headcutting could occur at the 140-foot-wide notch following dam removal potentially propagating upstream through the Rush Creek channel in the former Waugh lakebed. The headcutting process could cause two related impacts: (1) sediment releases as the channel incises into the reservoir bed material and increased rilling and gullying of newly exposed reservoir bed sediments due to lowering of the reservoir elevation, and (2) destabilize the banks of the evolving Rush Creek channel due to the incision, causing channel widening, and lateral destabilization of the channel upstream of the dam removal. Sediment released downstream could cause sedimentation in pools and riffles in Rush Creek which would continue until the upstream Rush Creek channel reaches an equilibrium gradient controlled by the invert elevation of the deconstructed dam outlet point.

Field studies in summer 2024 will help to identify bedrock outcrops under the lakebed sediments and their location relative to the historical channel. Such bedrock outcrops may serve as control points to stop upstream headcutting. A sediment transport model of the channel as part of the instream flow study will identify the elevation of the channel invert (at the dam) that will be stable and avoid potential headcutting. These results will be used to help design the dam removal and to characterize the potential impacts to sedimentation downstream of the dam site. Study results will be included in the Final License Application and this analysis will be updated, as appropriate.

With implementation of the site-specific restoration plan for Rush Meadows Dam and Waugh Lake, and removal of Rush Meadows Dam at an elevation that would not cause upstream headcutting or sediment deposition downstream, long-term operation and maintenance of the Project would have a negligible effect on geomorphology. In addition, over the long-term, Rush Meadows and Rush Creek would return to unimpaired conditions, which would be beneficial to geomorphology.

### Agnew Dam Removal

Under the Proposed Action, Agnew Dam would be removed, and the natural lake would remain at the current seismic restriction level (no storage). The former reservoir footprint includes exposed former inundation zones that could experience erosion. Much of the area, however, is dominated by steep bedrock, which would be highly resistant to erosion. Immediately behind the dam is a small amount of sediment that could be released with removal of the dam, but the likelihood is low as there is bedrock in the vicinity of the dam controlling the channel elevation. Since the area around Agnew Dam and Lake is dominated by steep bedrock, long-term operation and maintenance of the Project is not anticipated to affect geomorphology.

With implementation of the site-specific restoration plan for Agnew Dam and Lake, long-term operation and maintenance of the Project would have a negligible effect on geomorphology. In addition, over the long-term, Agnew Lake would return to its natural condition (except that inflow hydrology would be affected by Gem Dam), which would be beneficial to geomorphology.

## 9.3.6.2 Potential Effects to Sediment Transport and Channel Morphology Due to Increases in Flow Magnitude and Duration

### Sediment Transport Between Rush Meadows and Gem Lake due to Proposed Action Flows from Waugh Lake

Under the Proposed Action, flows in Rush Creek following the removal of Rush Meadows Dam could have a potential impact on sediment transport between Rush Meadows and Gem Lake. Removal of the dam would result in natural unimpaired flows with increased peak flows in Rush Creek from the former Rush Meadows Dam compared with existing conditions. Under existing conditions, the peak flows are captured in the reservoir. High flows are defined as flows greater than the 1.5-year recurrence interval (Table 9.3.6-1), which have an increase frequency, 150 percent of existing or a 50 percent increase. These flows would have a greater sediment transport capacity than the current impaired flows from Waugh Lake. These flows would benefit natural sediment transport.

Implementation of a site-specific restoration plan would minimize or mitigate any potential negative effects of dam removal within the former Waugh lakebed. Long-term, unimpaired flows from Rush Meadows to Gem Lake would allow the Rush Creek channel to return to its natural hydrology and allow natural channel maintenance processes to resume. Therefore, the potential effects on sediment transport and deposition on Rush Creek between Rush Meadows and Gem Lake associated with the Proposed Action are considered beneficial.

### Sediment Transport and Channel Morphology of Rush Creek Below Gem Dam Due to Increased Magnitude and Duration of Flows

Under the Proposed Action, removal of Rush Meadows Dam would result in increased peak flows into Gem Lake and increased frequency of high peak flows out of Gem Lake that could have potential impacts on sediment transport, scour, and deposition in Rush Creek below Gem Dam. Due to the elimination of storage in Waugh Lake following dam removal, Gem Lake would fill more quickly and frequently than it did prior to receiving unimpaired flows from Rush Meadows. This would result in a small increase in the frequency of releases below Gem Dam and Agnew Dam, 110 percent of existing or a 10 percent increase (Table 9.3.6-1) (AQ 2 – Hydrology Technical Study Report [TSR], SCE 2024b), which could cause a small increase in sediment transport and erosion in Rush Creek below Gem Dam.

Rush Creek below Gem Dam to the valley flows is predominantly steeper-gradient bedrock, cascade, and step-pool channel. These channel types are characterized as transport reaches, having a much greater capacity to transport sediment and are not as sensitive to sediment flow or supply. These reaches are also considered mostly non-adjustable. Rush Creek reaches on the valley floor, immediately above and below Silver Lake, is composed of moderate-to-low-gradient plane-bed, pool-riffle, and dune-ripple channel types (Section 8.7, Geomorphology), which have limited transport capacity and greater channel roughness. These lower gradient channel types are adjustable with deformable bed and banks.

Increased sediment transport would be expected to affect the lower gradient, deformable bed and bank reaches. A small alteration in channel dimension could occur in cross-section, profile, and planform while the channel is adjusting to the new Proposed Action flow regime. A small amount of channel widening, deepening, and alteration of meander geometry are some of the potential processes to occur to the low-gradient reaches. A small increase in overbank flows would likely accompany these processes while the channel adjusts to the higher and more frequent flows. The increased frequency of peak flows would increase channel maintenance flows and could facilitate an incremental return to the natural hydrology of Rush Creek. The new flow regime under the Proposed Action would have a small beneficial effect on sediment transport and geomorphic processes.

### 9.3.6.3 Potential Effects to the Supply and Transport of Large Woody Debris Due to Increased High Flows

Large wood debris (LWD) can be found throughout the Rush Creek channel; however, the location with the most LWD is the wooded stream segments of Rush Creek and South Rush Creek on the valley floor upstream of Silver Lake.

LWD/downed trees masses within the stream channels can cause adverse effects through conveyance blockage, localized channel alterations, and backwater effects. Deposition of individual large wood pieces, however, can create beneficial channel diversity for aquatic species by creating scour pools, channel cover, and hydraulic complexity. These structures moderate sediment conveyance, causing sediment deposition downstream of features and bank erosion upstream where there are deformable banks. Primary factors that influence wood transport and retainment are stream flows and reach geomorphic characteristics. Flow characteristics include the general shape of the hydrograph, magnitude, duration, and rate of rise and fall and sequence of flows through time (Kramer and Wohl 2016).

Annual flow recurrence magnitudes under the Proposed Action are expected to increase between 1.5- and 50-year flow events for each project reach (AQ 2 – Hydrology TSR, SCE 2024b). Bankfull (approximated by the 1.5-year event) recurrence flows are expected to increase frequency, 114 percent of existing or an increase of 14 percent upstream of Silver Lake (Table 9.3.6-1). Potential impacts to supply and transport of woody debris in the vicinity of the Project in response to increased flow magnitude and durations include:

- Greater wood transport from increased magnitude and duration of flow near or just under bankfull (Kramer and Wohl 2016).
- Greater wood deposition in channels and reservoirs from increased peak flow events, particularly events with steeply rising hydrographs.
- For the steep, confined channels, with coarse substrate, like sections of Rush Creek above the valley floor, high flows will overtop roughness elements, transport capacity will increase, but wood flux will be limited by supply (Kramer and Wohl 2016).
- In small rivers (1st and 2nd order), like South Rush Creek, increased frequency of high flows will flush and transport woody debris downstream or into the floodplain.
- In medium size rivers (2nd – 4th order), like Rush Creek, low recurrence, yearly flows will re-organize individual pieces of wood into jam stable states, whereas exceptional high-flow events will re-organize jams (Kramer and Wohl 2016).

Under existing conditions, SCE performs maintenance activities related to LWD, primarily to remove the debris from the reservoirs to maintain safe function of the spillways and flow outlets (Seth Carr, December 11, 2023) (AQ 5 – Geomorphology TSR, Table AQ 5-11; SCE 2024a). Under the Proposed Action, LWD would continue to be removed for safe function of the Gem Dam spillway but would require less maintenance due to the new pour over spillway crest. In high-flow years, LWD would pour over the modified Gem Dam spillway. With removal of Rush Meadows and Agnew dams, LWD would freely pass through the system. The Proposed Action does not affect forested lands, so wood supply is not expected to change.

A small increase in the frequency of higher magnitude flows approximating the bankfull discharge is expected to increase the transport of LWD from the low-gradient reaches, specifically above Silver Lake. Increased woody debris transport could open channels that currently have LWD, conversely increased transport could block instream structures, such as culverts and bridge crossings. SCE would continue to manage LWD at Project facilities as described in Section 4.4.7. Overall, with the small increase in frequency of higher magnitude flows under the Proposed Action, and continued management of LWD at Project facilities, there would be a benefit to LWD transport in the vicinity of the Project.

#### 9.3.6.4 Environmental Measures

Implementation of operation and maintenance activities under the Proposed Action would have a negligible or beneficial effect on geomorphology, including sediment transport, geomorphic processes, and transport of LWD; therefore, no environmental measures are proposed.

#### 9.3.6.5 Unavoidable Adverse Effects

There are no unavoidable adverse effects to geomorphology from continued operation and maintenance of the Project under the Proposed Action.

#### 9.3.6.6 References

Carr, Seth. 2023. Southern California Edison Company. Personal communication, SCE Operations and Maintenance Manager, December 11.

Kramer, N., and E. Wohl. 2016. Rules of the Road: A qualitative and quantitative synthesis of large wood transport through drainage networks. Dept of Geosciences, Colorado State University, Fort Collins, Colorado, August.

SCE (Southern California Edison Company). 2024a. Draft AQ 5 – Geomorphology Technical Study Report. August. Available in Supporting Document A of the Application for New License.

———. 2024b. Draft AQ 2 – Hydrology Technical Study Report. August. Available in Supporting Document A of the Application for New License.

# TABLES

**Table 9.3.6-1. Average Number of Days per Year the Rush Creek 1.5-year Flow Recurrence Equaled or Exceeded for Unimpaired and Impaired Hydrologic Regimes**

| Location | 1.5-year Recurrence Interval Q (cfs)a | Average Number Days per Year the 1.5-year Recurrence Flow Equaled or Exceeded[a] | | | |
|---|---|---|---|---|---|
| | | Unimpaired | Historical | Proposed | Existing |
| Rush Creek Below Silver Lake | 396 | 16.5 | 6.4 | 11.6 | 11.1 |
| *Percent of Existing Conditions* | | *149%* | *58%* | *105%* | *NA* |
| Rush Creek Upstream of Reversed Creek Confluence | 249 | 11.2 | 1.5 | 3.3 | 2.9 |
| *Percent of Existing Conditions* | | *386%* | *52%* | *114%* | *NA* |
| Rush Creek Below Agnew Dam | 334 | 22.0 | 3.7 | 7.8 | 7.1 |
| *Percent of Existing Conditions* | | *310%* | *52%* | *110%* | *NA* |
| Rush Creek Below Rush Meadows Dam | 217 | 9.3 | 7.0 | 9.3 | 6.2 |
| *Percent of Existing Conditions* | | *150%* | *113%* | *150%* | *NA* |

Notes: [a] Based on modeled hydrology over the 33 year period from water year 1990-2022

Key: cfs = cubic feet per second

## TABLE OF CONTENTS

Page


9.3.7 Wetland, Riparian, and Littoral Habitats – Operation and Maintenance Effects ........ 9.3.7-1

9.3.7.1 Potential Effects of Operations on Wetland, Riparian, and Littoral Habitats ........ 9.3.7-2

9.3.7.2 Potential Effects of Maintenance on Wetland, Riparian, and Littoral Habitats ........ 9.3.7-5

9.3.7.3 Long-term Benefits from Reductions in Operation and Maintenance and Restoration ........ 9.3.7-7

9.3.7.4 Environmental Measures ........ 9.3.7-7

9.3.7.5 Unavoidable Adverse Effects ........ 9.3.7-8

9.3.7.6 References ........ 9.3.7-8


## LIST OF ACRONYMS

| | |
|---|---|
| kV | kilovolt |
| MIF | minimum instream flows |
| NNIP | non-native invasive plant |
| PCA | Pest Control Advisor |
| Project | Rush Creek Project |
| SCE | Southern California Edison Company |

### 9.3.7 Wetland, Riparian, and Littoral Habitats – Operation and Maintenance Effects

This section describes the potential effects to wetland, riparian, and littoral habitats that could occur because of continued operation and maintenance activities implemented under the Proposed Action for Southern California Edison Company's (SCE) Rush Creek Project (Project). A description of operation and maintenance activities to be implemented under the Proposed Action is included in Section 5.

Potential effects are determined by analyzing the changes to wetland, riparian, and littoral habitats that may result from activities to be implemented under the Proposed Action compared to the No-Action Alternative (existing condition) (Section 4). Final effects determinations consider environmental measures, management and monitoring plans (environmental measures) to be included under the Proposed Action (refer to Section 5, Appendix 5-C). Unavoidable adverse effects are discussed at the end of this section.

Wetland, riparian, and littoral resources discussed in this section are connected to and/or influenced by the hydrology of Project reservoirs and Project-affected stream reaches. As described in Section 8.8, Wetland, Riparian and Resources Affected Environment, these habitats are associated with floodplains and littoral zones. 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.

Potential effects to wetland, riparian, and littoral habitats in Project reservoirs and Project-affected stream reaches from continued operation and maintenance activities were evaluated as follows:

**Potential Effects to Wetland, Riparian, and Littoral Habitats**

- Potential effects of changes in operations on wetland, riparian, and littoral habitats along Project reservoirs and Silver Lake
  - Unimpaired flows into Gem Lake
  - Modified water elevations at Gem Lake
  - Flows below Gem Dam
- Potential Effects of Maintenance on Wetland, Riparian, and Littoral Habitats
  - Direct loss of riparian vegetation from Project vegetation management activities
  - Potential introduction or spread of non-native invasive plants (NNIP)
- Long-term benefit from reduction in operation and maintenance and restoration

Refer to Section 9.3.1, Water Use and Hydrology – Operation and Maintenance Effects for a discussion of potential effects to hydrology. Refer to Section 9.3.6, Geomorphology – Operation and Maintenance Effects for a discussion of potential effects to geomorphology. Effects to riparian dependent botanical and wildlife species from operation and maintenance activities are provided in Section 9.3.4, Botanical and Wildlife Resources – Operation and Maintenance Effects.

This section relies on information obtained during botanical resource studies (SCE 2024a) and instream flow studies (SCE 2024b) conducted in 2023 as part of relicensing.

#### 9.3.7.1 Potential Effects of Operations on Wetland, Riparian, and Littoral Habitats

The primary changes in operations under the Proposed Action include implementation of natural, unimpaired flows in Rush Creek below the former Rush Meadows Dam and into Gem Lake; modification of water elevations at Gem Lake; and higher flows below Gem Dam. Provided below is a discussion of the potential effects of each of these changes on wetland, riparian, and littoral habitats at Project reservoirs and Project-affected stream reaches.

**Unimpaired Flows into Gem Lake**

Under existing conditions, there is 0.68 acre of riparian habitat along Waugh Lake. Fully developed riparian communities (i.e., containing mature age classes and visible on aerial imagery) are mostly confined to the floodplains of tributary streams that drain into Waugh Lake. Rush Creek below Rush Meadows Dam consists of both low-gradient and steep gradient sections. The steeper-gradient sections are confined within the bedrock and have a very narrow floodplain. There are 13.89 acres of riparian habitat within this reach that is typically confined to the channel.

Following removal of Rush Meadows Dam and subsequent restoration, minimum instream flows (MIF) into Rush Creek below the former Waugh Lake would be discontinued, and natural, unimpaired flows would be re-established. Unimpaired flows into Gem Lake could result in potential effects to wetland, riparian, and littoral habitat in Waugh Lake and Rush Creek Below Rush Meadows Dam.

Under the Proposed Action, Waugh Lake would no longer temporarily store water when high inflows exceed the low-level outlet capacity, as occurs under the No-Action Alternative. The limited storage that currently occurs under the No-Action Alternative would be eliminated, and Waugh Lake would return to natural unimpaired conditions (i.e., a central creek channel bordered by a diverse mosaic of habitats (including wet meadow, riparian, and forest habitats). Removal of Rush Meadows Dam and Waugh Lake and re-establishment of the historic Rush Creek channel within the lakebed would therefore benefit wetland, riparian, and littoral habitats over the long term.

In the short-term, release of sediment from the former lakebed of Waugh Lake during high flows could result in temporary effects to riparian vegetation immediately below Rush Meadows Dam (refer to Section 9.3.2, Water Quality – Operation and Maintenance

Effects), if high flows carry sediment that buries riparian vegetation. However, these effects typically only last in the year immediately following dam removal (Shafroth et al. 2016). Furthermore, the restoration plans for the former lakebed of Rush Creek that would revegetate and stabilize sediment in the former Waugh lakebed would reduce these effects after dam removal. Restoration of wetland and riparian habitats within the former lakebed would also provide connectivity between riparian habitats in Rush Creek upstream and downstream of Waugh Lake. Refer to Section 9.2.7, Wetland, Riparian, and Littoral Habitats – Construction Effects for more details on the effects of lakebed restoration on wetland, riparian, and littoral habitats.

Several studies have demonstrated that regulated river channels experience lower flows, higher rates of channel armoring, and older riparian age structures compared to unregulated channels upstream of the dams (Kondolf et al. 1987, Merritt and Cooper 2000, Shafroth et al 2016). These conditions can make it difficult for early successional riparian species to colonize and tend to homogenize the riparian forest below dams (Shafroth et al. 2016). SCE has conducted long-term riparian monitoring in Rush Creek below Rush Meadows Dam, and studies have indicated low recruitment of riparian saplings in this reach (E. Read and Associates, Inc. 2023). Therefore, in the long-term, removal of Rush Meadows Dam and restoration of natural flows is expected to increase the diversity of riparian vegetation as a result of occasional scouring of the channel during high-flow events and a return to natural sediment transport dynamics, which may in turn increase recruitment. Over time, the diversity of riparian species, age structure, and interannual distribution is expected to increase compared to the No-Action Alternative (Shafroth et al. 2016).

Removal of Rush Meadows Dam, re-establishment of unimpaired flows into Gem Lake, and implementation of restoration would therefore benefit riparian habitats in Waugh Lake and Rush Creek below Rush Meadows Dam.

**Modified Water Elevations at Gem Lake**

As described in Section 8.8, 0.94 acre of riparian vegetation is present within the floodplain of tributary streams that drains into Gem Lake. There are no wetlands or littoral habitats along the margins of Gem Lake under existing conditions.

Under the Proposed Action, SCE would retrofit Gem Dam to facilitate compliance with seismic restrictions. Maximum reservoir elevations would be consistent with the No-Action Alternative (9,027.5 feet). Gem Lake reservoir elevations would be maintained as described in the Recreation Reservoir Elevation Objectives Measure (Section 5, Appendix 5-C), which states that SCE will make every reasonable effort the achieve the specified reservoir water surface elevation objectives between July 1 and the Tuesday following Labor Day between 5 and 15 feet from the spillway elevation depending on the April 1 snow water equivalent percentage at Agnew Pass.

Refer to Section 9.3.1 for a detailed description the operations of Gem Lake under the Proposed Action. Overall, implementation of operations under the Proposed Action would result in negligible changes in the timing and elevation of reservoir water surface elevations as compared to the No-Action Alternative. Because riparian vegetation is restricted to the floodplain of tributary streams and is not within the littoral zone of the reservoir and considering that operations of Gem Lake would be similar to the No-Action Alternative, operation of Gem Lake under the Proposed Action would have no effect on riparian habitats.

**Flows Below Gem Dam**

Section 8.8 provides a description of Rush Creek from Gem Dam to Silver Lake; a brief summary is provided below. Riparian habitat at the higher elevations of the Rush Creek Project is limited to discontinuous bands dominated by willow species (*Salix* spp), including yellow willow (*Salix lutea*) and arroyo willow (*Salix lasiolepis*), as well as stands of aspen (*Populus tremuloides*).[1] There are no wetland habitats along these upper reaches of Rush Creek.

The breadth of the floodplain along Rush Creek increases below Rush Creek Powerhouse, opening into an extensive wet meadow complex containing thickets of riparian vegetation along Rush Creek above Silver Lake. This wet meadow is inundated with water following snowmelt and then dries out over the summer.

Most of Silver Lake is deep and contains little vegetation within the littoral zone, but emergent wetland vegetation has established within the ordinary high water mark along the southern shoreline. This emergent vegetation gradually blends into a large wet meadow that is interspersed within dense riparian willow thickets.

Rush Creek below Silver Lake supports a broad band of riparian vegetation along this section of Rush Creek that is characterized by arroyo willow, aspen, and lodgepole pine (SCE 2024a).

South Rush Creek also supports riparian vegetation, including stands of willow and aspen and a wet meadow system. Under existing conditions, South Rush Creek is primarily a high-flow channel. The amount of water that flows into South Rush Creek at the channel junction just downstream of Horsetail Falls (upstream of State Route 158) varies depending on the flow in Rush Creek.

Overall, under the Proposed Action, while MIFs in Project-affected stream reaches below Gem Dam would be maintained consistent with the No-Action Alternative, removal of Rush Meadows Dam and restoration of unimpaired flows would result in an overall increase in the number and frequency of high flows. Refer to Section 9.3.1 for a detailed description of changes in hydrology under the Proposed Action.

[1] For the purposes of this analysis, aspen is considered a riparian alliance. While aspen can occur on upland sites, in the analysis area it is typically associated with Rush Creek or other creek drainages. It is also considered a sensitive natural community by the California Department of Fish and Wildlife (CDFW 2023).

Flow increases during peak flow events would have a very small beneficial effect on riparian vegetation through channel scouring that enhance recruitment dynamics in the Project-affected stream reaches, but these effects would not occur during typical water years. In typical water years, there would be no difference in patterns of inundation from the No-Action Alternative, with implementation of the MIFs. This would have a beneficial effect on scour and riparian vegetation recruitment dynamics and is expected to have no effect on wetland and littoral habitat. Overall, the Proposed Action would have a negligible to beneficial effect on wetland, riparian and littoral habitat downstream of Gem Dam.

### 9.3.7.2 Potential Effects of Maintenance on Wetland, Riparian, and Littoral Habitats

Provided below is an analysis of the potential direct and indirect effects of maintenance of the Project on wetland, riparian, and littoral habitats.

## Direct Effects

Maintenance activities that could affect wetland, riparian or littoral habitats include vegetation management (trimming by hand and herbicide application) in the direct vicinity of Gem Dam, Rush Creek Powerhouse, and associated facilities. Herbicides are only used on SCE lands inside the powerhouse substation perimeter fence and 10 to 15 feet outside the fence to control weeds and vegetation encroachment.

There are no wetlands or littoral habitats within the maintenance footprint under the Proposed Action. There are also no riparian habitats near Gem Dam (or ancillary facilities), along the tramways, or along the penstock that would be affected by maintenance.

Riparian habitat is present in two areas where vegetation trimming by hand would continue to be implemented under the Proposed Action. This includes a small area under the 4-kilovolt (kV) Agnew Distribution Line and along the Rush Creek Powerhouse Complex Access Road and associated bridges over the Rush Creek Powerhouse Tailrace and Rush Creek.

- The 4-kV Agnew Distribution Line crosses a patch of aspen riparian forest near the existing Agnew Junction Valve House and Standpipe. Hand trimming of vegetation is conducted within 10 feet on either side of this powerline. Hazard tree removal is conducted on an as-needed basis. Hand trimming and hazard tree removal may result in removal of a small amount of riparian vegetation over the term of the license.

- Riparian vegetation dominated by aspen and lodgepole pine, with associated willows and herbaceous vegetation, is present along the Rush Creek Powerhouse Complex Access Road and associated bridges over the Rush Creek Powerhouse Tailrace and Rush Creek (SCE 2024a). Minor trimming/removal of riparian vegetation may be required for road maintenance and/or minor bridge repairs on an as-needed basis. In addition, herbicide application within the Rush Creek Powerhouse Complex could potentially affect wetland and riparian habitats.

Although ongoing maintenance activities may result in trimming of riparian vegetation or removal of hazard riparian trees, under the Proposed Action, long-term maintenance activities would be reduced compared to the existing condition. Following completion of the proposed Project facility modifications, Rush Meadows dam and associated facilities would be removed and would no longer require maintenance. SCE would restore natural, unimpaired flows in Rush Creek within the lakebed and in Rush Creek downstream of Rush Meadows Dam. Removal of Rush Meadows Dam and Waugh Lake, re-establishment and restoration of the historic Rush Creek channel within the lakebed, and re-establishment of natural flows within Rush Creek downstream of Rush Meadows Dam would result in an increase in riparian vegetation along this reach as compared to the No-Action Alternative. In addition, restoration of the perimeter of Gem Lake and the former Agnew Lakebed may also increase riparian vegetation over time.

In addition, herbicides would continue to be applied under the supervision of a Pest Control Advisor (PCA) and consistent with label instruction (application methods, protective buffers for aquatic habitats). Best management practices will be implemented to minimize the potential for spills, establish transport and storage protocols, and reduce the overall risk of potential contamination of aquatic and riparian habitats.

With removal of Rush Meadows and Agnew dams and associated facilities, implementation of restoration plans, and continued application of herbicides by a PCA consistent with label instructions, the Proposed Action would result in an overall benefit to riparian over the long-term as compared to the No-Action alternative.

**Indirect Effects**

Ongoing maintenance activities could result in the spread or introduction of NNIPs to wetland, riparian and littoral habitats.

Following construction and restoration activities, Rush Meadows and Agnew dams and associated facilities would be removed, would no longer require operation or maintenance actions, and the dam and facility sites would be restored. As described in Section 9.2.4, ongoing monitoring and treatment of NNIPs within the restored lakebeds or perimeter of lakes would be implemented consistent with the Restoration Plan for each site. Implementation of the restoration plans for Waugh Lake and Agnew Lake, in combination with the cessation of ongoing maintenance activities in the vicinity of Waugh Lake and Agnew Lake, would minimize the potential for introduction or spread of NNIPs to riparian areas under the Proposed Action.

Transport of materials on Project trams and foot traffic associated with long-term maintenance of the Project has some potential to introduce new NNIPs or expand existing NNIP populations to riparian areas. To minimize the potential for introduction or spread of NNIPs, SCE will implement measures specified in the Vegetation Management Measure, including training, maintaining stockpiles weed-free, removal and properly disposing of observable weed seeds and plant parts from clothing and boots, and use of certified weed free material for erosion control. Continued implementation of the worker environmental awareness training (including training on NNIPs) would further minimize effects associated with NNIPs. Refer to Appendix 5-C for a complete description of the Vegetation Management Measure to be implemented as part of the Proposed Action.

Changes in water quality under the Proposed Action could also potentially affect riparian habitats. Overall water quality in the vicinity of the Project is of high quality (e.g., cold temperatures, high dissolved oxygen, no contaminants) and no Project-related water quality issues were identified during studies conducted as part of relicensing (SCE 2024c). Changes in Project operations under the Proposed Action would not result in effects to water quality. There is, however, some potential for a temporary increase in turbidity and total suspended solids following dam removal/retrofit as a result of the newly exposed reservoir beds or inundation zones and increased flows in Rush Creek (upstream of Gem Dam) when compared to existing conditions, particularly in Rush Creek below Rush Meadows Dam, where Rush Creek has a lower gradient and is more susceptible to channel incision/headcutting. Any increases in turbidity values would be reduced by revegetation and stabilization of the lakebeds and creek channels described in the restoration plans; and would be expected to quickly return to normal levels. Refer to Section 9.2.7, Wetland, Riparian, and Littoral Habitats – Construction Effects for detailed analysis of construction effects from Project facility modifications.

With implementation of the Vegetation Management Measures and restoration plans under the Proposed Action effects to riparian habitats would be negligible.

#### 9.3.7.3 Long-term Benefits from Reductions in Operation and Maintenance and Restoration

Under the Proposed Action, long-term operation and maintenance activities would be reduced compared to the existing condition. Following construction activities, Rush Meadows and Agnew dams and associated facilities would be removed, would no longer require operation or maintenance actions, and the dam and facility sites would be restored. Natural unimpaired flows would be re-established in Rush Creek within Waugh lakebed and in Rush Creek downstream of the former dam site. Removal of the dams (re-establishment of natural unimpaired flows downstream of Rush Meadows Dam) and restoration of Waugh lakebed and the perimeter of the natural lake at Agnew would, overtime, result in a benefit to riparian as compared to the No-Action Alternative. Refer to Section 9.2.7, for the effects of construction on wetland, riparian, and littoral habitat under the Proposed Action.

#### 9.3.7.4 Environmental Measures

Implementation of operation and maintenance activities under the Proposed Action would have a negligible to beneficial effect on wetland, riparian, and littoral habitats in the long-term with implementation of the following measures (Appendix 5-C):

- Minimum Instream Flow Measure
- Recreation Reservoir Elevation Objectives Measure
- Vegetation Management Measure

#### 9.3.7.5 Unavoidable Adverse Effects

There are no unavoidable adverse effects to wetland, riparian, or littoral habitats from long-term operation and maintenance activities under the Proposed Action.

#### 9.3.7.6 References

CDFW (California Department of Fish and Wildlife). 2023. California Sensitive Natural Communities. June 1, 2023.

E. Read and Associates, Inc. 2023. Analysis of Riparian Vegetation: 2022 Field Season and Comparison to Previous Years. Rush Creek Project (FERC No. 1389). Prepared by Edith Read, Ph.D., E Read and Associates, Inc., Orange, CA, for Southern California Edison Company, Generation – Regulatory Support Services.

Kondolf, G.M., J.W. Webb, M.J. Sale, and T. Felando. 1987. Basic hydrologic studies for assessing impacts of flow diversions on riparian vegetation: examples from streams of the Eastern Sierra Nevada, California, USA. Environmental Management 11(6): 757–769.

Merritt, D.M., and D.J. Cooper. 2000. Riparian vegetation and channel change in response to river regulation: a comparative study of regulated and unregulated streams in the Green River Basin, USA. Regulated Rivers: Research and Management 16: 543–564.

SCE (Southern California Edison Company). 2024a. Draft TERR 1 – Botanical Resources Technical Study Report. August. Available in Supporting Document A of the Application for New License.

_____. 2024b. Draft AQ 1 – Instream Flow Technical Study Report. August. Available in Supporting Document A of the Application for New License.

_____. 2024c. Draft AQ 2 – Water Quality Technical Study Report. August. Available in Supporting Document A of the Application for New License.

Shafroth, P.B., L.G. Perry, C.A. Rose, and J.H. Braatne. 2016. Effects of dams and geomorphic context on riparian forests of the Elwha River, Washington. Ecosphere 7(12): e01621.

## TABLE OF CONTENTS

Page

9.3.8 Land Use – Operation and Maintenance Effects ........................................ 9.3.8-1
9.3.8.1 Potential Effects of Continued Operation and Maintenance of the Project on Land Use.............................................................. 9.3.8-1
9.3.8.2 Environmental Measures .................................................................. 9.3.8-1
9.3.8.3 Unavoidable Adverse Effects ........................................................... 9.3.8-1

## LIST OF ACRONYMS

| | |
|---|---|
| Project | Rush Creek Project |
| SCE | Southern California Edison Company |

### 9.3.8 Land Use – Operation and Maintenance Effects

This section describes the potential effects to land use that could occur because of continued operation and maintenance activities to be implemented under the Proposed Action for Southern California Edison Company's (SCE) Rush Creek Project (Project). A description of operation and maintenance activities to be implemented under the Proposed Action is included in Section 5.

Potential effects are determined by analyzing the changes in land use that may result from activities to be implemented under the Proposed Action compared to the No-Action Alternative (Section 4). Final effects determinations consider environmental measures, management, and monitoring plans (environmental measures) to be included under the Proposed Action (refer to Section 5, Appendix 5-C). Unavoidable adverse effects are discussed at the end of this section.

The following potential effects to land use because of continued operation and maintenance activities were evaluated:

- Potential effects of continued operation and maintenance of the Project on land use.

#### 9.3.8.1 Potential Effects of Continued Operation and Maintenance of the Project on Land Use.

Under the Proposed Action, long-term operation and maintenance activities would be reduced compared to the No-Action Alternative. Following the completion of construction activities, Rush Meadows and Agnew dams and associated facilities would be removed, would no longer require operation or maintenance actions, and the dam and ancillary facility sites would be restored. Continued operation and maintenance activities at the remaining facilities would generally be the same as they are under existing condition and would not result in any changes to land use designation or current uses within the Federal Energy Regulatory Commission Project boundary. Refer to Section 9.2.8, Land Use – Construction Effects for a detailed analysis of construction (including restoration) effects from implementation of Project facility modifications and the benefits of removal of facilities from the Ansel Adams Wilderness. The reduction in Project facilities and continued operation and maintenance activities would have no effect on land use.

#### 9.3.8.2 Environmental Measures

Implementation of operation and maintenance activities under the Proposed Action, including the removal of Project facilities, would have no effect or a beneficial effect on land use; therefore, no environmental measures are proposed.

#### 9.3.8.3 Unavoidable Adverse Effects

There are no unavoidable adverse effects to land use from continued operation and maintenance of the Project under the Proposed Action.

## TABLE OF CONTENTS

Page

9.3.9 Recreation Resources – Operation and Maintenance Effects .................... 9.3.9-1
9.3.9.1 Potential Effects to Recreation Access and Opportunities Associated with Changes in Project Operations and Maintenance....................... 9.3.9-1
9.3.9.2 Environmental Measures .................................................................. 9.3.9-2
9.3.9.3 Unavoidable Adverse Effects ............................................................ 9.3.9-2

## LIST OF ACRONYMS

| | |
|---|---|
| Project | Rush Creek Project |
| SCE | Southern California Edison Company |

## 9.3.9 Recreation Resources – Operation and Maintenance Effects

This section describes the potential effects to recreation resources that could occur as a result of continued operation and maintenance activities to be implemented under the Proposed Action for Southern California Edison Company's (SCE) Rush Creek Project (Project). A description of operation and maintenance activities to be implemented under the Proposed Action is included in Section 5.

Potential effects are determined by analyzing the changes in recreation resources that may result from activities to be implemented under the Proposed Action compared to the No-Action Alternative (existing condition) (Section 4). Final effects determinations consider environmental measures, management, and monitoring plans (environmental measures) to be included under the Proposed Action (refer to Section 5, Appendix 5-C). Unavoidable adverse effects are discussed at the end of this section.

The following potential effects to recreation resources because of continued operation and maintenance activities were evaluated:

- Potential effects to recreation access and opportunities associated with changes in Project operations and maintenance.

This section relies on data collected as part of the REC 1 – Recreation Technical Study Plan (TSP).

### 9.3.9.1 Potential Effects to Recreation Access and Opportunities Associated with Changes in Project Operations and Maintenance

The Project does not include any developed recreation facilities that would support recreation use. However, Agnew, Gem and Waugh lakes, and the surrounding area offer opportunities for dispersed outdoor recreation, including camping, hiking, and fishing.

Under the Proposed Action, SCE would retrofit Gem Dam to facilitate compliance with seismic restrictions. Maximum reservoir elevations would be consistent with the No-Action Alternative (9,027.5 feet). Gem Lake reservoir elevations would be maintained as described in the Recreation Reservoir Elevation Objectives Measure (Appendix 5-C), which states that SCE will make every reasonable effort to achieve the specified reservoir water surface elevation objectives between July 1 and the Tuesday following Labor Day depending on the April 1 snow water equivalent percentage at Agnew Pass. While recreation reservoir levels under the Proposed Action are modified, reservoir-based recreation opportunities would be maintained.

In addition, under the Proposed Action, long-term operation and maintenance activities would be reduced compared to the No-Action Alternative. Following construction activities, Rush Meadows and Agnew dams and associated facilities would be removed, would no longer require operation or maintenance actions, and the dam and facility sites would be restored. Natural flows would be re-established in Rush Creek within Waugh lakebed and in Rush Creek downstream of the former dam site. Removal of the dams (reestablishment of natural flows downstream of Rush Meadows Dam) and restoration of

Waugh lakebed and the perimeter of the natural lake at Agnew would maintain recreation opportunities similar to the No-Action Alternative. Refer to Section 9.2.9, Recreation Resources – Construction Effects for a detailed analysis of construction (including restoration) effects from implementation of Project facility modifications.

Under the Proposed Action, with implementation of the Recreation Reservoir Elevation Objectives Measure at Gem Lake (Appendix 5-C) and removal of Rush Meadows and Agnew dams and associated restoration activities, dispersed recreation access and opportunities would be maintained consistent with the No-Action Alternative.

#### 9.3.9.2 Environmental Measures

Implementation of operation and maintenance activities under the Proposed Action would have a negligible effect on recreation resources with implementation of the Recreation Reservoir Elevation Objectives Measure (Appendix 5-C).

#### 9.3.9.3 Unavoidable Adverse Effects

There are no unavoidable adverse effects to recreation resources from continued operation and maintenance of the Project under the Proposed Action.

## TABLE OF CONTENTS

Page

9.3.10 Aesthetics – Operation and Maintenance Effects .................................... 9.3.10-1

9.3.10.1 Potential Effects to Aesthetic Resources Resulting from Changes in Project Operations Affecting Reservoir Water Surface Elevations 9.3.10-1

9.3.10.2 Potential Effects to Aesthetic Resources Resulting from Changes in Project Operations Affecting Flow ............................................... 9.3.10-3

9.3.10.3 Potential Effects Related to Compatibility of the Project Facilities with Forest Service's Scenery Management System ....................... 9.3.10-4

9.3.10.4 Environmental Measures ................................................................ 9.3.10-4

9.3.10.5 Unavoidable Adverse Effects ......................................................... 9.3.10-5

## LIST OF ACRONYMS

| | |
|---|---|
| Forest Service | United States Forest Service |
| INF | Inyo National Forest |
| MIF | minimum instream flow |
| Project | Rush Creek Project |
| SCE | Southern California Edison Company |
| SIO | Scenic Integrity Objective |

### 9.3.10 Aesthetics – Operation and Maintenance Effects

This section describes the potential effects to aesthetic resources that could occur because of continued operation and maintenance activities to be implemented under the Proposed Action for Southern California Edison Company's (SCE) Rush Creek Project (Project). A description of operation and maintenance activities to be implemented under the Proposed Action is included in Section 5.

Potential effects are determined by analyzing the changes in aesthetics that may result from activities to be implemented under the Proposed Action compared to the No-Action Alternative (existing condition) (Section 4). Final effects determinations consider environmental measures, management, and monitoring plans (environmental measures) to be included under the Proposed Action (refer to Section 5, Appendix 5-C). Unavoidable adverse effects are discussed at the end of this section.

The following potential effects to aesthetic resources because of continued operation and maintenance activities were evaluated:

- Potential effects to aesthetic resources resulting from changes in Project operations affecting reservoir water surface elevations (i.e., Gem Lake).
- Potential effects to aesthetic resources resulting from changes in Project operations affecting flow (i.e., minimum instream flows [MIF] in Rush Creek).
- Potential effects related to compatibility of the Project facilities with United States Forest Service's (Forest Service) Scenery Management System.

For the discussion pertaining to the potential effects resulting from retrofitting Gem Dam and from removing Agnew and Rush Meadows dams refer to Section 9.2.10.

#### 9.3.10.1 Potential Effects to Aesthetic Resources Resulting from Changes in Project Operations Affecting Reservoir Water Surface Elevations

Under the No-Action Alternative, Gem Lake is limited to a water surface elevation of 9,027.5 feet to meet seismic restrictions and alleviate safety concerns, resulting in a 256-acre reservoir with a storage capacity of 10,752 acre-feet. Gem Lake fills up to the maximum seismic restriction capacity in the late spring and early summer and maintains storage through the summer. Most of the storage is released in the fall to early spring period through the Rush Creek Powerhouse in preparation for subsequent refill of the reservoir.

The existing Project license includes United States Forest Service 4(e) Condition No. 8, Recreation and Wilderness Management that requires specific reservoir elevations be maintained at Gem Lake, based on season and water year type, to support dispersed recreation at Project reservoirs. Specifically, the current license specifies that water surface elevation in Gem Lake from July 1 to the Tuesday following Labor Day be maintained as follows:

- Within 2 feet of the spillway elevation in regular water years
- Within 6 feet of spillway elevation in low water years (<75 percent of the April 1 snow water equivalent for the Mono Basin).

Under the Proposed Action, SCE would retrofit Gem Dam to facilitate compliance with seismic restrictions. The maximum reservoir surface elevation would be consistent with the No-Action Alternative (9,027.5 feet). Additionally, and consistent with the No-Action Alternative, Gem Lake would be allowed to fill to the maximum seismic restriction capacity during snowmelt runoff in the late spring and early summer and storage would be released in the fall and early spring period in preparation for subsequent refill of the reservoir.

Under the Proposed Action, Gem Lake reservoir elevations would be maintained as described in the Recreation Reservoir Elevation Objectives Measure (Appendix 5-C). This measure directs that SCE make every reasonable effort to maintain the water surface elevation from July through Labor Day weekend, depending on the April 1 snow water equivalent percentage at Agnew Pass, as follows:

| April 1 Snow Water Equivalent Percent at Agnew Pass[1] | Gem Lake Elevation Objectives, Elevation from the Spillway (feet) | Date |
|---|---|---|
| >100% | 5 | August 1 through the Tuesday after Labor Day weekend |
| 75-100% | 5 | July 1 through the Tuesday after Labor Day weekend |
| 40-<75% | 10 | |
| <40% | 15 | |

[1] Agnew Pass snow water equivalent is located at site AGP – Agnew Pass on the California Data Exchange Center. In the event snow water equivalent data is not available at Agnew Pass, an alternate site such as GEM – Gem Pass may be used.

In summary, while the maximum reservoir surface elevation under the Proposed Action would be consistent with the No-Action Alternative (9,027.5 feet), the water surface elevation could be between 3 and 7 feet lower than under No-Action Alternative between July 1 and the Tuesday following Labor Day weekend, depending on the water year and SCE's management of water flow operations. As a result, a greater portion of the shoreline below the maximum reservoir surface elevation could be exposed than under the No-Action Alternative. When a recently inundated shoreline is exposed, it creates a bathtub ring around the lake that makes the dam and reservoir more obvious features of the landscape. The additional vertical feet of shoreline potentially exposed under the Proposed Action July through the Tuesday following Labor Day weekend would be partially mitigated by the revegetation and stabilization of the former inundation zone (the area exposed since implementation of the seismic restriction),[1] and, in any case, would not create a significantly different visual experience than that of the bathtub ring already often visible when the water elevation of the lake is lower than its maximum allowable elevation. Accordingly, continued operation and maintenance of the Proposed Action would have a negligible effect to aesthetic resources compared to the No-Action Alternative.

#### 9.3.10.2 Potential Effects to Aesthetic Resources Resulting from Changes in Project Operations Affecting Flow

Under the Proposed Action, Rush Meadows and Agnew dams would be removed and hydroelectric operations and MIF requirements at both dams would be discontinued. Gem Dam would be retrofitted to operate at a reservoir elevation of 9,027.5 feet (consistent with the current seismic restriction) and hydroelectric operations would continue at Gem Dam and Rush Creek Powerhouse relatively consistent with operation and maintenance activities under the existing license. As pertaining to flow, water captured in Gem Lake would continue to be conveyed via Project flowlines and penstocks to the Rush Creek Powerhouse or released into the natural stream channel from low-level outlets and/or flowline valves. Under the Proposed Action, MIF requirements below Gem Dam would be consistent with the existing license and include a continuous minimum flow of 1 cubic foot per second or natural flows when the level of Gem Lake falls below the face of the dam.

Under the No-Action Alternative, Waugh Lake temporarily stores water when inflows exceed the capacity of the low-level outlets, which moderates natural peak flows in Rush Creek below Rush Meadows Dam. Under the Proposed Action, SCE would remove Rush Meadows Dam, and therefore there would no longer be moderation of natural peak flows into Rush Creek downstream of the former Rush Meadows Dam. As a result, there would be an increase in the frequency and magnitude of natural high-flow events above Gem Lake such that flows entering Gem Lake would be unimpaired and higher during peak flow events. Natural high-flow releases and spills from Gem Dam into Rush Creek, therefore, would also be higher and/or more frequent under the Proposed Action. Outside of these natural high-flow conditions, releases from Gem Dam into Rush Creek would remain consistent with releases under the No-Action Alternative—Gem Lake would continue to store water and be drawn down annually in the fall / winter as is done under the No-Action Alternative. During the annual drawdown of Gem Lake, only the MIF would be released below the dam. As such, the changes to the flows in Rush Creek as a result of changes to Project operations would not be apparent, from an aesthetic standpoint. Rather, the type of water year (wet, average, or dry), and the timing and speed of snowmelt runoff are expected to have a more significant influence on the aesthetic variation in the flows of Rush Creek than effects of implementing the Proposed Action. Therefore, changes in Project operations associated with implementation of the Proposed Action would have a negligible effect on aesthetic resources associated with flow.

[1] The maximum elevation of Gem Lake prior to the seismic restriction was 9,052 feet. The current maximum surface elevation is 9,027.5 feet, an elevation difference of 24.5 feet.

Refer to Section 9.3.1, Water Use and Hydrology for more details about changes in hydrology affecting flows.

#### 9.3.10.3 Potential Effects Related to Compatibility of the Project Facilities with Forest Service's Scenery Management System

Scenic Integrity Objectives (SIO) were assigned to the management areas that constitute the Inyo National Forest (INF) as a part of the most recent INF Land Management Plan update completed in 2019. SIOs for all lands within the Ansel Adams Wilderness is "Very High" and "High" for all other National Forest land within the vicinity of the Project (refer to Map 8.11-1).

- Very high 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 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.

While accepted by the Forest Service as nonconforming uses, Project facilities currently conflict with the Forest Service SIO of "Very High" and "High."

Under the Proposed Action, Rush Meadows and Agnew dams would be removed; only the abutments at each dam would remain. Additionally, many of the ancillary facilities associated with each dam would be removed (particularly those associated with Rush Meadows Dam). As a result, the visual elements associated with each dam that disrupt the integrity of the landscape due to a combination of contrasting or intrusive lines, shapes, textures and colors would be minimized or eliminated; therefore, the visual character of the area where the dams are currently located would be expected to improve and potentially conform with the SIO designations assigned to the landscape within which they are located.

Gem Dam and Lake would be the only remaining Project facilities on National Forest System land following Project facility modifications. As discussed above, retrofitting of Gem Dam is expected to moderately improve the landscape viewshed from some vantage points because the visual mass of Gem Dam would be reduced, particularly from upstream viewpoints. However, the Gem Dam and ancillary facilities would largely remain similar from a visual perspective, and inconsistent with the SIO rating of "High" and "Very High."

#### 9.3.10.4 Environmental Measures

Implementation of operation and maintenance activities under the Proposed Action would have a negligible or beneficial effect on aesthetic resources; therefore, no environmental measures are proposed.

### 9.3.10.5 Unavoidable Adverse Effects

There are no unavoidable adverse effects to aesthetic resources from continued operation and maintenance of the Project under the Proposed Action.

## TABLE OF CONTENTS

Page


9.3.11 Cultural Resources – Operation and Maintenance Effects ....................... 9.3.11-1
9.3.11.1 Potential Adverse Effects to Historic Properties and The Historic Properties Management Plan ........................................................ 9.3.11-1
9.3.11.2 Potential Effects to Cultural Resources from Continued Maintenance of Project Facilities .................................................... 9.3.11-2
9.3.11.3 Potential Effects to Cultural Resources from Changes in Project Operations ........................................................................... 9.3.11-3
9.3.11.4 Environmental Measures ............................................................. 9.3.11-4
9.3.11.5 References ........................................................................... 9.3.11-5


## LIST OF TABLES


Table 9.3.11.1. Potential Effects to Built Environment and Archaeological Resources from Changes in Operation and Maintenance Activities under the Proposed Action Compared to the No-Action Alternative ........................................................... 9.3.11-7


## LIST OF ACRONYMS

| | |
|---|---|
| CFR | Code of Federal Regulations |
| Forest Service | United States Forest Service |
| HPMP | Historic Properties Management Plan |
| NRHP | National Register of Historic Places |
| Project | Rush Creek Project |
| RCHSHD | Rush Creek Hydroelectric System Historic District |
| SCE | Southern California Edison Company |
| SHPO | State Historic Preservation Officer |
| Tribes | American Indian Tribes |
| TSR | Technical Study Report |

### 9.3.11 Cultural Resources – Operation and Maintenance Effects

This section describes the potential effects to cultural resources (archaeological and built environment resources) that could occur because of continued operation and maintenance activities to be implemented under the Proposed Action for Southern California Edison Company's (SCE) Rush Creek Project (Project). A description of operation and maintenance activities to be implemented under the Proposed Action is included in Section 5.

Potential effects are determined by analyzing the changes to cultural resources that may result from activities to be implemented under the Proposed Action compared to the No-Action Alternative (existing condition) (Section 4). This effects analysis considers environmental measures, management, and monitoring plans (environmental measures) to be included under the Proposed Action (refer to Section 5, Appendix 5-C).

As discussed in Section 8.12, Cultural Resources Affected Environment, the Draft CUL 1 – Built Environment Technical Study Report (TSR) (Riggs, Boswell, and Walton 2024) and Draft CUL 2 – Archaeology TSR (Canoff et al. 2024) are being reviewed by SCE, the United States Forest Service (Forest Service) and other stakeholders. The Final License Application will contain more complete information on TSRs and the final effects determination. Federal Energy Regulatory Commission as the lead agency makes the final effects determination in consultation with the Forest Service. The State Historic Preservation Officer (SHPO) concurs on the effects determination.

The following potential effects to cultural resources were analyzed:

- Potential effects to cultural resources from continued maintenance activities.
- Potential effects to cultural resources from changes to Project operations as result of Project facility modifications

#### 9.3.11.1 Potential Adverse Effects to Historic Properties and The Historic Properties Management Plan

An adverse effect is defined in the regulations implementing section 106 of the National Historic Preservation Act of 1966 (Section 106) at 36 Code of Federal Regulations (CFR) Part 800.5(a)(1). Pursuant to that definition, an adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register of Historic Places (NRHP) in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. A resource that has not yet been evaluated for the NRHP is assumed eligible for listing and treated as historic property until determined otherwise.

Section 106 requires that every federal agency "take into account" how each of its undertakings could affect historic properties. Historic properties are districts, sites, buildings, structures, traditional cultural properties, and objects significant in American history, architecture, engineering, and culture that are eligible for inclusion in the NRHP.

SCE currently implements a Historic and Archaeological Protection Plan to manage potential effects to cultural resources from Project operation and maintenance activities. SCE intends to develop a Historic Properties Management Plan (HPMP) that will include measures to avoid, minimize, or mitigate adverse effects to cultural resources from operation and maintenance activities. The HPMP will incorporate results from cultural resource studies conducted for relicensing as well as concurrence on eligibility received from the SHPO. The HPMP will be developed in consultation with the Forest Service, American Indian Tribes (Tribes) and SHPO and will outline implementation procedures such as management roles and responsibilities, Tribal and agency consultation, project review requirements, implementation protocols including annual meetings and reporting, as well processes for revision of the HPMP and dispute resolution.

Any Finding of *Adverse Effect* identified through the review of a proposed Project activity including decommissioning plans or modification plans for Project facilities will follow the Section 106 process pursuant to 36 CFR Part 800.5 *assessment of adverse effects* and 800.6 *resolution of adverse effects*. Resolution of an adverse effect, as defined in 36 CFR Part 800.6, requires consulting with the SHPO, affected Tribes, and federal land managing agencies and developing a Section 106 agreement document (typically a Memorandum of Agreement or Programmatic Agreement that sets out the measures the federal agency will implement to resolve those adverse effects through avoidance, minimization, or mitigation.

### 9.3.11.2 Potential Effects to Cultural Resources from Continued Maintenance of Project Facilities

To ensure system operability and efficiency, Project facilities are subject to ongoing maintenance, including general repair, replacement of constituent components, electrical and mechanical upgrade, and structural or material reinforcement. The Project itself is a NRHP-eligible historic district (the Rush Creek Hydroelectric System Historic District or RCHSHD) and many operational facilities are contributing elements. Therefore, there is a potential for such activities to have an effect upon any built environment resources that are contributing to the RCHSHD. Maintenance activities may affect archaeological and built environment resources if the activity involves ground disturbance or has the potential to cause indirect effects such as erosion and visual effects.

Table 9.3.11-1 provides a qualitative discussion of potential effects to archaeological and built environment resources from maintenance activities to be implemented under the Proposed Action compared to the No-Action Alternative. Under the Proposed Action, long-term operation and maintenance activities would be reduced compared to the existing condition. Following construction activities, Rush Meadows and Agnew dams and associated facilities would be removed, would no longer require operation or maintenance actions, and the dam and facility sites would be restored.

To protect cultural resources during maintenance activities, SCE will develop and implement an HPMP that includes measures to avoid, minimize, or mitigate adverse effects to cultural resources from maintenance activities. The HPMP will be developed in consultation with the Forest Service, Tribes and SHPO.

#### 9.3.11.3 Potential Effects to Cultural Resources from Changes in Project Operations

The following sections discuss potential effects to cultural resources from changes to Project operations following the competition of Project facility modifications under the Proposed Action (Section 5).

**Potential Effects to Cultural Resources Resulting from Changes in Project Operations Affecting Reservoir Water Surface Elevations**

Under the Proposed Action, Rush Meadows and Agnew dams would be removed and no longer impound water. Operations at these facilities would be discontinued and the dam site and lakebeds would be restored.

Under the No-Action Alternative, Gem Lake reservoir is limited to a water surface elevation of 9,027.5 feet to meet seismic restrictions and alleviate safety concerns, resulting in a 256-acre reservoir with a storage capacity of 10,752 acre-feet. Gem Lake fills up to the maximum seismic restriction capacity in the late spring and early summer and maintains storage through the summer. Most of the storage is released in the fall to early spring period through the Rush Creek Powerhouse in preparation for subsequent refill of the reservoir.

Under the Proposed Action, SCE would retrofit Gem Dam to facilitate compliance with seismic restrictions. The maximum reservoir surface elevation would be consistent with the No-Action Alternative (9,027.5 feet). SCE will operate Gem Lake during the July through Labor Day weekend season to meet the primary hydropower generation purpose of the reservoir and to maintain a storage space buffer in the lake to accommodate variable high and low inflows depending on the water year type. SCE will also support reservoir-based recreation by making every reasonable effort to achieve the water surface elevation objectives described in the Recreation Reservoir Elevation Objectives Measure (Appendix 5-C).

This Project operation has the potential to affect archaeological resources by creating a new zone of wave action and erosion for archaeological resources located within and surrounding Gem Lake. Additionally, archaeological resources that are typically inundated under Gem Lake have the potential to be exposed and be more susceptible to looting. The HPMP will address these effects and provide guidance on protection measures such as erosion control measures to reduce effects from reservoir wave action and monitoring.

This Project operation does not have the potential to affect built environment resources.

**Potential Effects to Cultural Resources Resulting from Changes in Project Operations Affecting Flow**

Under the Proposed Action, Rush Meadows Dam and Waugh Lake would be removed and minimum instream flow requirements in Rush Creek below Rush Meadows dam would be discontinued. Flows in Rush Creek above and below the former dam site would be unimpaired (natural).

Under the Proposed Action, Agnew Dam would be removed, and Gem Dam would be retrofitted. Minimum instream flow requirements under the Proposed Action in Rush Creek below Gem Dam and at the gaging flume below Agnew Lake (natural lake) are described in the Minimum Instream Flow Measure (Appendix 5-C). The minimum flow requirements are the same as in the No-Action Alternative.

With removal of Rush Meadows Dam, there could be an increase in the frequency of natural high flow events in Rush Creek. Under the No-Action Alternative, Waugh Lake temporarily stores water when inflows exceed the capacity of the low-level outlets, which moderates natural peak flows in Rush Creek below Rush Meadows Dam. Under the Proposed Action, flows entering Gem Lake would be unimpaired and higher during peak flow events. Natural high flow releases and spills from Gem Dam into Rush Creek, therefore, would also be higher and/or more frequent under the Proposed Action.

With reestablishment of natural flows downstream of the former Rush Meadows Dam and maintaining minimum instream flows downstream of Gem Dam and the former Agnew Dam, the natural flows in Rush Creek as a result of the removal of Agnew Dam and Rush Meadows Dam would not be considered a Project effect, and therefore Project operations under the Proposed Action do not have the potential to affect built environment or archaeological resources in the former Agnew Dam and Rush Meadows Dam sites and locations downstream.

To protect cultural resources during Project operations at Gem Dam and other remaining Project facilities, SCE will develop and implement an HPMP that includes measures to avoid, minimize, or mitigate adverse effects to cultural resources from Project operations. The HPMP will be developed in consultation with the Forest Service, Tribes and SHPO.

### 9.3.11.4 Environmental Measures

Implementation of operation and maintenance activities under the Proposed Action has the potential to affect cultural resources. However, SCE will develop and implement an HPMP that includes measures to avoid, minimize, or mitigate adverse effects to cultural resources from operation and maintenance activities. The HPMP will be developed in consultation with the Forest Service, Tribes and SHPO. Refer to Appendix 5-C for a description of the HPMP.

### 9.3.11.5 References

Canoff, Alyssa, Kaitlin Harstine, Mark Sutton, and Emily Holt. 2024. CUL 2 – Archaeological Resources Technical Study Report for the Rush Creek Project (FERC Project No. 1389). To be provided in the Final License Application.

Riggs, Becca, Lauren Walton, and Sharon Boswell. 2024. CUL 1 – Built Environment Technical Study Report for the Rush Creek Project (FERC Project No. 1389). To be provided in the Final License Application.

# TABLES

**Table 9.3.11.1. Potential Effects to Built Environment and Archaeological Resources from Changes in Operation and Maintenance Activities under the Proposed Action Compared to the No-Action Alternative**

| Maintenance Activity | No-Action Alternative (Continued Maintenance Activity) | Changes to O&M Activities under the Proposed Action | Potential Effects to Built Environment Resources | Potential Effects to Archaeological Resources |
|---|---|---|---|---|
| Powerhouse Inspection and Maintenance | SCE conducts an annual maintenance outage at the powerhouse. During the outage, SCE conducts comprehensive mechanical and electrical inspections, testing, and maintenance of the powerhouse appurtenances, as well as any repairs to Project penstocks as appropriate. | Changes to the Rush Creek Powerhouse would not occur as part of the Proposed Action. As a result, maintenance activities would remain the same as the No-Action Alternative. | The Rush Creek powerhouse including equipment and penstocks are contributing elements of the RCHSHD. Any maintenance activities that would change equipment or add additional equipment would be reviewed under the HPMP to avoid adverse effects. In-kind maintenance is considered a beneficial effect. | No potential effects to archaeological resources are anticipated unless powerhouse maintenance activities are located outside of the powerhouse and involve ground disturbance, which would require review under the HPMP to avoid adverse effects. |
| Powerhouse Complex Maintenance | Repairs to other buildings and ancillary facilities located within the powerhouse complex are made on an as-needed basis, including painting, building maintenance, and access road/bridge repairs. | Changes to the powerhouse complex, including ancillary and support facilities, would not occur as part of the Proposed Action. As a result, maintenance activities would remain the same as the No-Action Alternative. | The Rush Creek powerhouse complex is a contributing element of the RCHSHD. Any repairs or proposed modifications would be reviewed under the HPMP to avoid adverse effects. In-kind maintenance is considered a beneficial effect. | Any repairs or modifications that involve ground disturbance have the potential to affect archaeological resources and would be reviewed under the HPMP to avoid adverse effects. |
| Flowline/Penstock and Valve House Inspections and Maintenance | Each quarter, SCE conducts physical inspection of the exterior of flowlines/penstocks (including valves, air valves, releases, and standpipe) and valve houses. Minor repairs, including patching leaks and conducting valve house repairs (e.g., applying new paint, siding, and/or roofing) are made on an as-needed basis. | The Rush Meadows Dam Valve House, the Agnew Dam to Agnew Junction Flowline, and the Agnew Dam Valve House would be removed as part of the Proposed Action. | Flowlines, penstocks and associated valves are contributing elements of the RCHSHD. Maintenance that requires alterations or additions would be reviewed under the HPMP to avoid adverse effects. In-kind maintenance is considered a beneficial effect.<br>Effects from removal of these features as part of the Proposed Action are discussed in Section 9.2.11. | Any repairs or modifications that involve ground disturbance have the potential to affect archaeological resources and would be reviewed under the HPMP to avoid adverse effects. |
| Dam Inspections, Testing, and Maintenance | To identify routine maintenance needs, SCE visually inspects all dams and appurtenances monthly. In addition, each year, intake grates are manually cleaned, and valves/low-level outlets are tested. Every five years, valves/low-level outlets are fully opened for testing. | The Rush Meadows Dam and Agnew Dam would be removed as part of the Proposed Action. | This activity does not have the potential to affect built environment resources. | This activity does not have the potential to affect archaeological resources. |
| Tram Inspections and Maintenance | The Agnew and Gem trams (including tracks, ties, rollers, and cables) are inspected weekly when operational (approximately late May to late September) to ensure the tracks are clear and have no excess wear. | Changes to the Agnew and Gem trams, including hoist houses and supportive facilities, would not occur as part of the Proposed Action. As a result, maintenance activities would remain the same as the No-Action Alternative. | Agnew and Gem trams are contributing elements of the RCHSHD. Maintenance that requires alterations or additions to character defining features would be reviewed under the HPMP to avoid adverse effects. In-kind maintenance is considered a beneficial effect. | Any maintenance that involves ground disturbance has the potential to affect archaeological resources and would be reviewed under the HPMP to avoid adverse effects. |
| Vegetation Management | Vegetation management occurs on an ongoing basis, and includes hand trimming, removing hazard trees, and applying herbicide. | Several facilities would be removed as part of the Proposed Action. | This activity does not have the potential to affect built environment resources. | Hazard tree removal or any other vegetation management that involves ground disturbance has the potential to affect archaeological resources and would be reviewed under the HPMP to avoid adverse effects. |
| Woody Debris Removal | SCE removes woody debris that builds up along the dams and has the potential to block spillways and low-level outlets. At Rush Meadows Dam, debris is flushed downstream. At Agnew Dam and Gem Dam, debris is hoisted from the water using heavy equipment, and burned on-site. | The Rush Meadows Dam and Agnew Dam would be removed as part of the Proposed Action. Thus, woody debris removal would no longer be required at the Rush Meadows Dam and Agnew Dam locations, and maintenance requirements would be reduced. Woody debris removal as Gem Dam would continue as it occurs under the No-Action Alternative. | This activity does not have the potential to affect built environment resources. | Locations where woody debris is piled, staged and burned has the potential to affect archaeological resources and would be reviewed under the HPMP to avoid adverse effects. |

| Maintenance Activity | No-Action Alternative (Continued Maintenance Activity) | Changes to O&M Activities under the Proposed Action | Potential Effects to Built Environment Resources | Potential Effects to Archaeological Resources |
|---|---|---|---|---|
| Pest Management | Pest management occurs on an ongoing basis to prevent rodent infestations in Project facilities. | Several facilities would be removed as part of the Proposed Action. | This activity does not have the potential to affect built environment resources. | This activity does not have the potential to affect archaeological resources. |
| Trail Maintenance | Project access trails are regularly inspected during normal Project activities. Repairs are conducted on an as-needed basis. | Rush Meadows Dam Access Trail would be removed as part of the Proposed Action. The Lower Gem Dam, Gem Dam Arch 8, Upper Gem Dam, and Agnew Stream Gage Access trails would be retained. | This activity does not have the potential to affect built environment resources. | Trail maintenance and trail removal that involves ground disturbance has the potential to affect archaeological resources and would be reviewed under the HPMP to avoid adverse effects. |
| Power and Communication Line Maintenance | Power and communication line maintenance includes replacement of damaged poles on an as-needed basis. | Two 4-kV power lines would be removed from the Agnew Dam Area; however, all other power and communication lines would remain as is with implementation of the Proposed Action. | These lines have been determined not eligible for the NRHP and therefore removal would not affect built environment resources. | Maintenance and removal of power lines that require ground disturbance has the potential to affect archaeological resources and would reviewed under the HPMP to avoid adverse effects. |
| Site- specific Restoration Activities | | Under the Proposed Action, SCE will develop restoration plans to be implemented at Project reservoirs/dams the year following completion of construction activities. Conceptual restoration plans will be developed in collaboration with resource agencies following filing of the Draft License Application. Detailed restoration plans will be developed in collaboration with resource agencies following issuance of FERC's License Order and will continue for a specified amount of time after completion of construction activities. | Site-specific restoration activities do not have the potential to affect built environment resources. | Site-specific restoration activities at Project reservoirs/dams have the potential to affect archaeological resources through ground disturbance associated with stabilization, restoration, revegetation activities and restoration of the natural stream channel. To protect Tribal resources during on-going restoration activities, SCE will develop and implement an HPMP that includes consultation protocols with Tribes and the Forest Service, and measures to avoid, minimize, or mitigate adverse effects. |

Key: FERC = Federal Energy Regulatory Commission
HPMP = Historic Properties Management Plan
kV = kilovolt
O&M = operations and maintenance
RCHSHD = Rush Creek Hydroelectric System Historic District
SCE = Southern California Edison Company

## TABLE OF CONTENTS

Page

9.3.12 Tribal Resources – Operation and Maintenance Effects .......................... 9.3.12-1
9.3.12.1 Potential Adverse Effects to Historic Properties and The Historic Properties Management Plan.......................................................... 9.3.12-1
9.3.12.2 Potential Effects to Tribal Resources from Continued Maintenance of Project Facilities ............................................................................ 9.3.12-2
9.3.12.3 Potential Effects to Tribal Resources from Changes in Project Operations ......................................................................................... 9.3.12-3
9.3.12.4 Environmental Measures ............................................................... 9.3.12-4
9.3.12.5 References........................................................................................ 9.3.12-4

## LIST OF TABLES

Table 9.3.12.1. Potential Effects to Tribal Resources from Changes in Operation and Maintenance Activities under the Proposed Action Compared to the No-Action Alternative............................ 9.3.12-6

## LIST OF ACRONYMS

| | |
|---|---|
| CFR | Code of Federal Regulations |
| FERC | Federal Energy Regulatory Commission |
| Forest Service | United States Forest Service |
| HAPP | Historic and Archaeological Protection Plan |
| HPMP | Historic Properties Management Plan |
| NRHP | National Register of Historic Places |
| Project | Rush Creek Project |
| SCE | Southern California Edison Company |
| SHPO | State Historic Preservation Officer |
| Tribes | American Indian Tribes |
| TSR | Technical Study Report |

### 9.3.12 Tribal Resources – Operation and Maintenance Effects

This section describes the potential effects to Tribal resources that could occur because of continued operation and maintenance activities to be implemented under the Proposed Action for Southern California Edison Company's (SCE) Rush Creek Project (Project). A description of operation and maintenance activities to be implemented under the Proposed Action is included in Section 5.

Potential effects are determined by analyzing the changes to Tribal resources that may result from activities to be implemented under the Proposed Action compared to the No-Action Alternative (existing condition) (Section 4). This effects analysis considers environmental measures, management, and monitoring plans (environmental measures) to be included under the Proposed Action (refer to Section 5, Appendix 5-C).

As discussed in Section 8.13, Tribal Resources Affected Environment, the Draft TRI 1 – Tribal Resources Technical Study Report (TSR) (West and Lerch 2024) is being reviewed by SCE, American Indian Tribes (Tribes), and the United States Forest Service (Forest Service). The Final License Application will contain more complete information on TSRs and the final effects determination. Federal Energy Regulatory Commission (FERC) as the lead agency makes the final effects determination in consultation with the Forest Service. The State Historic Preservation Officer (SHPO) concurs on the effects determination.

The following potential effects to Tribal resources were analyzed:

- Potential effects to Tribal resources from continued Project operation and maintenance activities.
- Potential effects to Tribal resources from changes to Project operations as result of Project facility modifications

#### 9.3.12.1 Potential Adverse Effects to Historic Properties and The Historic Properties Management Plan

An adverse effect is defined in the regulations implementing section 106 of the National Historic Preservation Act of 1966 (Section 106) at 36 Code of Federal Regulations (CFR) Part 800.5(a)(1). Pursuant to that definition, an adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property (Tribal resource) that qualify the property for inclusion in the National Register of Historic Places (NRHP) in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. A resource that has not yet been evaluated for the NRHP is assumed eligible for listing and treated as historic property until determined otherwise.

Section 106 requires that every federal agency "take into account" how each of its undertakings could affect historic properties. Historic properties are districts, sites, buildings, structures, traditional cultural properties, and objects significant in American history, architecture, engineering, and culture that are eligible for inclusion in the NRHP.

SCE currently implements a Historic and Archaeological Protection Plan (HAPP) to manage potential effects to cultural resources from Project operation and maintenance activities (Tribal resources were not addressed in the HAPP). SCE intends to develop a Historic Properties Management Plan (HPMP) that will include measures to avoid, minimize, or mitigate adverse effects to cultural and Tribal resources from operation and maintenance activities. The HPMP will incorporate results from cultural and Tribal resource studies conducted for relicensing as well as concurrence on eligibility received from the SHPO. The HPMP will be developed in consultation with Tribes, Forest Service, and SHPO and will outline implementation procedures such as management roles and responsibilities, Tribal and agency consultation, project review requirements, implementation protocols including annual meetings and reporting, as well processes for revision of the HPMP and dispute resolution.

Any Finding of *Adverse Effect* identified through the review of a proposed Project activity including decommissioning plans or modification plans for Project facilities will follow the Section 106 process pursuant to 36 CFR Part 800.5 *assessment of adverse effects* and 800.6 *resolution of adverse effects*. Resolution of an adverse effect, as defined in 36 CFR Part 800.6, requires notifying the Advisory Council on Historic Preservation; consulting with the SHPO, interested parties and land managing agencies; and developing a Section 106 agreement document (typically a Memorandum of Agreement or Programmatic Agreement) that sets out the measures the federal agency will implement to resolve those adverse effects through avoidance, minimization, or mitigation.

#### 9.3.12.2 Potential Effects to Tribal Resources from Continued Maintenance of Project Facilities

To ensure system operability and efficiency, Project facilities are subject to ongoing maintenance, including general repair, replacement of constituent components, electrical and mechanical upgrade, and structural or material reinforcement. Maintenance activities may affect Tribal resources if the activity involves ground disturbance or has the potential to cause indirect effects such as erosion, visual effects or access issues to Tribal resources.

Table 9.3.12-1 provides a qualitative discussion of potential effects to Tribal resources from maintenance activities to be implemented under the Proposed Action compared to the No-Action Alternative. Under the Proposed Action, long-term operation and maintenance activities would be reduced compared to the existing condition. Following construction activities, Rush Meadows and Agnew dams and associated facilities would be removed, would no longer require operation or maintenance actions, and the dam and facility sites would be restored. This would provide an overall beneficial effect for Tribal resources.

To protect Tribal resources during maintenance activities, SCE will develop and implement an HPMP that includes Tribal consultation and measures to avoid, minimize, or mitigate adverse effects to Tribal resources from maintenance activities. The HPMP will be developed in consultation with Tribes, the Forest Service, and SHPO.

### 9.3.12.3 Potential Effects to Tribal Resources from Changes in Project Operations

The following sections discuss potential effects to Tribal resources from changes to Project operations following the competition of Project facility modifications under the Proposed Action (Section 5).

**Potential Effects to Tribal Resources Resulting from Changes in Project Operations Affecting Reservoir Water Surface Elevations**

Under the Proposed Action, Rush Meadows and Agnew dams would be removed and no longer impound water. Operations at these facilities would be discontinued and the dam site and lakebeds would be restored.

Under the No-Action Alternative, Gem Lake reservoir is limited to a water surface elevation of 9,027.5 feet to meet seismic restrictions and alleviate safety concerns, resulting in a 256-acre reservoir with a storage capacity of 10,752 acre-feet. Gem Lake fills up to the maximum seismic restriction capacity in the late spring and early summer and maintains storage through the summer. Most of the storage is released in the fall to early spring period through the Rush Creek Powerhouse in preparation for subsequent refill of the reservoir.

Under the Proposed Action, SCE would retrofit Gem Dam to facilitate compliance with seismic restrictions. The maximum reservoir surface elevation would be consistent with the No-Action Alternative (9,027.5 feet). SCE will operate Gem Lake during the July through Labor Day weekend season to meet the primary hydropower generation purpose of the reservoir and to maintain a storage space buffer in the lake to accommodate variable high and low inflows depending on the water year type. SCE will also support reservoir-based recreation by making every reasonable effort to achieve the water surface elevation objectives described in the Recreation Reservoir Elevation Objectives Measure (Appendix 5-C).

This Project operation has the potential to affect precontact archaeological resources that are associated with Tribal resources by creating a new zone of wave action and erosion for archaeological resources located within and surrounding Gem Lake. Additionally, archaeological resources that are typically inundated under Gem Lake have the potential to be exposed and be more susceptible to looting. The HPMP will address these potential effects and provide guidance on protection measures such as erosion control measures to reduce effects from reservoir wave action and site condition monitoring.

**Potential Effects to Tribal Resources Resulting from Changes in Project Operations Affecting Flow**

Under the Proposed Action, Rush Meadows Dam and Waugh Lake would be removed and minimum instream flow requirements in Rush Creek below Rush Meadows dam would be discontinued. Flows in Rush Creek above and below the former dam site would be unimpaired (natural).

Also under the Proposed Action, Agnew Dam would be removed, and Gem Dam would be retrofitted. Minimum instream flow requirements under the Proposed Action in Rush Creek below Gem Dam and at the gaging flume below Agnew Lake (natural lake) are described in the Minimum Instream Flow Measure (Appendix 5-C). The minimum flow requirements are the same as in the No-Action Alternative.

With removal of Rush Meadows Dam, there would be an increase in the frequency of natural high flow events in Rush Creek. Under the No-Action Alternative, Waugh Lake temporarily stores water when inflows exceed the capacity of the low-level outlets, which moderates natural peak flows in Rush Creek below Rush Meadows Dam. Under the Proposed Action, flows entering Gem Lake would be unimpaired and higher during peak flow events. Natural high flow releases and spills from Gem Dam into Rush Creek, therefore, would also be higher and/or more frequent under the Proposed Action.

With reestablishment of natural flows downstream of the former Rush Meadows Dam and maintaining minimum instream flows downstream of Gem Dam and the former Agnew Dam, the changes in Rush Creek flows as a result of changes to Project operations would provide a beneficial effect to Tribal resources by restoring natural flows in Rush Creek.

#### 9.3.12.4 Environmental Measures

Implementation of operation and maintenance activities under the Proposed Action has the potential to affect Tribal resources. However, SCE will develop and implement an HPMP that includes measures to avoid, minimize, or mitigate adverse effects to Tribal and cultural resources from operation and maintenance activities. The HPMP will be developed in consultation with Tribes, the Forest Service, Tribes and SHPO. Refer to Appendix 5-C for a description of the HPMP.

#### 9.3.12.5 References

West, Crystal and Michael K. Lerch. 2024. TRI 1 – Tribal Resources Technical Study Report for the Rush Creek Project (FERC Project No. 1389). To be provided in the Final License Application.

# TABLES

## Table 9.3.12.1. Potential Effects to Tribal Resources from Changes in Operation and Maintenance Activities under the Proposed Action Compared to the No-Action Alternative

| Maintenance Activity | No-Action Alternative (Continued Maintenance Activity) | Changes to O&M Activities under the Proposed Action | Potential Effects to Tribal Resources |
|---|---|---|---|
| Powerhouse Inspection and Maintenance | SCE conducts an annual maintenance outage at the powerhouse. During the outage, SCE conducts comprehensive mechanical and electrical inspections, testing, and maintenance of the powerhouse appurtenances, as well as any repairs to Project penstocks as appropriate. | Changes to the Rush Creek Powerhouse would not occur as part of the Proposed Action. As a result, maintenance activities would remain the same as the No-Action Alternative. | No potential effects to Tribal resources are anticipated unless powerhouse maintenance activities are located outside of the powerhouse and involve ground disturbance which would trigger review under the HPMP to avoid adverse effects. |
| Powerhouse Complex Maintenance | Repairs to other buildings and ancillary facilities located within the powerhouse complex are made on an as-needed basis, including painting, building maintenance, and access road/bridge repairs. | Changes to the powerhouse complex, including ancillary and support facilities, would not occur as part of the Proposed Action. As a result, maintenance activities would remain the same as the No-Action Alternative. | Any repairs or modifications that involve ground disturbance have the potential to affect Tribal resources and would need to be reviewed under the HPMP to avoid adverse effects. |
| Flowline/Penstock and Valve House Inspections and Maintenance | Each quarter, SCE conducts physical inspection of the exterior of flowlines/penstocks (including valves, air valves, releases, and standpipe) and valve houses. Minor repairs, including patching leaks and conducting valve house repairs (e.g., applying new paint, siding, and/or roofing) are made on an as-needed basis. | The Rush Meadows Dam Valve House, the Agnew Dam to Agnew Junction Flowline, and the Agnew Dam Valve House would be removed as part of the Proposed Action. | Any repairs or modifications that involve ground disturbance have the potential to affect Tribal resources would be reviewed under the HPMP to avoid adverse effects. The HPMP will SCE include consultation protocols to avoid, minimize, or mitigate adverse effects from any releases to Tribal access and ceremonial activities downstream of the release. |
| Dam Inspections, Testing, and Maintenance | To identify routine maintenance needs, SCE visually inspects all dams and appurtenances monthly. In addition, each year, intake grates are manually cleaned, and valves/low-level outlets are tested. Every five years, valves/low-level outlets are fully opened for testing. | The Rush Meadows Dam and Agnew Dam would be removed as part of the Proposed Action. | This maintenance activity does not have the potential to affect Tribal resources. |

| Maintenance Activity | No-Action Alternative (Continued Maintenance Activity) | Changes to O&M Activities under the Proposed Action | Potential Effects to Tribal Resources |
|---|---|---|---|
| Tram Inspections and Maintenance | The Agnew and Gem trams (including tracks, ties, rollers, and cables) are inspected weekly when operational (approximately late May to late September) to ensure the tracks are clear and have no excess wear. | Changes to the Agnew and Gem trams, including hoist houses and supportive facilities, would not occur as part of the Proposed Action. As a result, maintenance activities would remain the same as the No-Action Alternative. | Any maintenance that involves ground disturbance has the potential to affect Tribal resources and would be reviewed under the HPMP to avoid adverse effects. |
| Vegetation Management | Vegetation management occurs on an ongoing basis, and includes hand trimming, removing hazard trees, and applying herbicide. | Several facilities would be removed as part of the Proposed Action. | Vegetation management including use of herbicide has the potential to affect Tribal plant resources and gathering activities. SCE will develop a HPMP that includes consultation protocols, and measures to avoid, minimize, or mitigate adverse effects to Tribal resources from vegetation management activities. |
| Woody Debris Removal | SCE removes woody debris that builds up along the dams and has the potential to block spillways and low-level outlets. At Rush Meadows Dam, debris is flushed downstream. At Agnew Dam and Gem Dam, debris is hoisted from the water using heavy equipment, and burned on-site. | The Rush Meadows Dam and Agnew Dam would be removed as part of the Proposed Action. Thus, woody debris removal would no longer be required at the Rush Meadows Dam and Agnew Dam locations, and maintenance requirements would be reduced. Woody debris removal as Gem Dam would continue as it occurs under the No-Action Alternative. | Locations where woody debris is piled, staged and burned has the potential to affect precontact archaeological resources associated with Tribal resources and other Tribal resources. This would need to be reviewed under the HPMP to avoid adverse effects. |
| Pest Management | Pest management occurs on an ongoing basis to prevent rodent infestations in Project facilities. | Several facilities would be removed as part of the Proposed Action. | This activity does not have the potential to affect Tribal resources. |
| Trail Maintenance | Project access trails are regularly inspected during normal Project activities. Repairs are conducted on an as-needed basis. | Rush Meadows Dam Access Trail would be removed as part of the Proposed Action. The Lower Gem Dam, Gem Dam Arch 8, Upper Gem Dam, and Agnew Stream Gage Access trails would be retained. | Trail maintenance and trail removal that involves ground disturbance has the potential to affect precontact archaeological resources that are associated with Tribal resources. Ground disturbing maintenance would need to be reviewed under the HPMP to avoid adverse effects. |

| Maintenance Activity | No-Action Alternative (Continued Maintenance Activity) | Changes to O&M Activities under the Proposed Action | Potential Effects to Tribal Resources |
|---|---|---|---|
| Power and Communication Line Maintenance | Power and communication line maintenance includes replacement of damaged poles on an as-needed basis. | Two 4-kV power lines would be removed from the Agnew Dam Area; however, all other power and communication lines would remain as is with implementation of the Proposed Action. | This activity will not affect Tribal resources. |
| Site-specific Restoration Activities | | Under the Proposed Action, SCE will develop restoration plans to be implemented at Project reservoirs/dams the year following completion of construction activities. Conceptual restoration plans will be developed in collaboration with Tribes and resource agencies following filing of the Draft License Application. Detailed restoration plans will be developed in collaboration with resource agencies following issuance of FERC's License Order and will continue for a specified amount of time after completion of construction activities. | Site-specific restoration activities at Project reservoirs/dams have the potential to affect precontact archaeological resources associated with Tribal resources through ground disturbance associated with stabilization, restoration, revegetation activities and restoration of the natural stream channel. These activities also have the potential to affect other Tribal resources. To protect Tribal resources during on-going restoration activities, SCE will develop and implement an HPMP that includes consultation protocols, and measures to avoid, minimize, or mitigate adverse effects. |

Key: FERC = Federal Energy Regulatory Commission
HPMP = Historic Properties Management Plan
kV = kilovolt
O&M = operations and maintenance
RCHSHD = Rush Creek Hydroelectric System Historic District
SCE = Southern California Edison Company

## TABLE OF CONTENTS

Page

9.3.13 Socioeconomics – Operation and Maintenance Effects ........................... 9.3.13-1
9.3.13.1 Changes in Workforce and Housing Demand ................................. 9.3.13-1
9.3.13.2 Changes in Demand for Public Services......................................... 9.3.13-2
9.3.13.3 Changes in Consumptive Uses in the Rush Creek Watershed ........ 9.3.13-2
9.3.13.4 Effects of Reduced Power Generation on the Local Community ..... 9.3.13-2
9.3.13.5 Effects from Long-term Operation and Maintenance of the Project on the Local and Regional Economy............................................... 9.3.13-2
9.3.13.6 Effects on Low-income and Minority Populations (Environmental Justice)........................................................................................ 9.3.13-3
9.3.13.7 Environmental Measures ............................................................... 9.3.13-3
9.3.13.8 Unavoidable Adverse Effects ......................................................... 9.3.13-3
9.3.13.9 References...................................................................................... 9.3.13-3

## LIST OF ACRONYMS

| | |
|---|---|
| JLPUD | June Lake Public Utility District |
| Project | Rush Creek Project |
| SCE | Southern California Edison Company |

### 9.3.13 Socioeconomics – Operation and Maintenance Effects

This section describes the potential effects to socioeconomics that could occur because of continued operation and maintenance activities to be implemented under the Proposed Action for Southern California Edison Company's (SCE) Rush Creek Project (Project). A description of operation and maintenance activities to be implemented under the Proposed Action is included in Section 5.

Potential effects are determined by analyzing the changes in socioeconomics that may results from activities to be implemented under the Proposed Action compared to the No-Action Alternative (existing condition) (Section 4). Final effects determinations consider environmental measures, management, and monitoring plans (environmental measures) to be included under the Proposed Action (refer to Section 5, Appendix 5-C). Unavoidable adverse effects are discussed at the end of this section.

The following potential effects to socioeconomics because of continued operation and maintenance activities were evaluated:

- Changes in workforce and housing demand
- Changes in demand for public services
- Changes in consumptive uses in the Rush Creek Watershed
- Effects of reduced power generation on the local community
- Effects from long-term operation and maintenance of the Project on the local and regional economy
- Effects on low-income and minority populations (environmental justice)

#### 9.3.13.1 Changes in Workforce and Housing Demand

Under the Proposed Action, long-term operation and maintenance would be reduced compared to the No-Action Alternative. Following Project facility modifications, Rush Meadows and Agnew dams and their associated facilities would be removed, would no longer require operation or maintenance actions, and the dam and ancillary facility sites would be restored. Routine operation and maintenance activities would continue to be implemented at Gem Dam and Rush Creek Powerhouse consistent with the No-Action Alternative (Section 4.4). No new major operation or maintenance activities would be required. The workforce necessary to conduct long-term operation and maintenance of the Project would remain consistent with the workforce used to operate and maintain the Project under the No-Action Alterative. Since there would be no change to the number of employees necessary to operate and maintain the Project, there would not be a demand for additional housing. As a result, long-term operation and maintenance of the Project would have no effect on workforce or housing demand when compared to the No-Action Alternative.

### 9.3.13.2 Changes in Demand for Public Services

As discussed above, under the Proposed Action, long-term operation and maintenance would be reduced compared to the No-Action Alternative. The reduction in facilities and acreage requiring operation and maintenance under the Proposed Action would have no effect on demand for public services, including law enforcement and public safety, fire protection, emergency services/response, and road maintenance and repairs.

### 9.3.13.3 Changes in Consumptive Uses in the Rush Creek Watershed

There are no consumptive uses of water from Rush Creek upstream of the powerhouse. A minor amount of consumptive use occurs at the Rush Creek Powerhouse, supplied by the June Lake Public Utility District (JLPUD) from the Reversed Creek/June Lakes sub-basin. From Silver Lake downstream, there is a small amount of consumptive water use from the homes and recreational facilities along the Silver Lake shoreline (JLPUD, wells, springs, Alger Creek), but the major consumer of water in the Rush Creek river basin is the City of Los Angeles, which diverts water out of the lower Rush Creek river basin (and the larger Mono Basin) from Grant Lake, Parker Creek, and Walker Creek via the Los Angeles Aqueduct for domestic uses. Long-term operation and maintenance of the Project and flows from the powerhouse would not significantly change under the Proposed Action such that it would affect downstream consumptive uses in the Rush Creek Watershed; therefore, there would be no effect.

### 9.3.13.4 Effects of Reduced Power Generation on the Local Community

Under the Proposed Action, there would be an increase in power generation flows for the months of April and May and a decrease in flows from June through August. The modeling indicates that power generation flows in other months are not likely to be affected. The overall power generation flow (considering all months) would be reduced by less than 1 percent, compared to the No-Action Alternative. Refer to Section 9.3.1, Water Use and Hydrology for further discussion on power generation. Changes to Project operations under the Proposed Action would have a negligible effect on power generation and a negligible effect to the availability of locally generated power to the surrounding community.

### 9.3.13.5 Effects from Long-term Operation and Maintenance of the Project on the Local and Regional Economy

The local and regional economy of the town of June Lake and surrounding area is largely dependent on recreation tourism. Approximately 38.5 percent of all employment in Mono County is directly associated with travel and recreation (EDD 2018). As discussed in Section 9.3.9, Recreation, removal of Rush Meadows and Agnew dams (reestablishment of natural flows downstream of Rush Meadows Dam) and restoration of Waugh lakebed and the perimeter of the natural lake at Agnew would maintain recreation opportunities similar to the No-Action Alternative. These activities include a wide variety of backcountry dispersed recreation activities, including hiking, backpacking, camping, swimming, and fishing. Likewise, while recreation reservoir elevations at Gem Lake under the Proposed

Action would be modified compared to No-Action conditions, reservoir-based recreation opportunities, including fishing, swimming and camping near the shoreline, would be maintained (Recreation Reservoir Elevation Objectives Measure, Appendix 5-C). Additionally, the Proposed Action could result in increased or enhanced recreational experiences after the development and implementation of restoration plans (e.g., the visual quality and character of the landscape near Waugh Lake is expected to improve), which may contribute positively to the existing recreation-based, tourist-based economy.

Because the same dispersed recreation opportunities and access to those opportunities that are available under the No-Action Alternative would be available during long-term operation and maintenance of the Project, there would be no effect on the local and regional economy, which is largely dependent on recreation tourism.

Refer to Section 9.2.9, Recreation Resources – Construction Effects for a detailed analysis of construction (including restoration) effects from implementation of Project facility modifications.

#### 9.3.13.6 Effects on Low-income and Minority Populations (Environmental Justice)

Environmental justice effects occur if low-income or minority populations incur a disproportionately high share of adverse socioeconomic effects caused by implementation of an action. Consistent with the No-Action Alternative, ongoing operation and maintenance of the Project would not result in adverse socioeconomic effects. In addition, as discussed in the Draft EJ 1 – Environmental Justice Technical Study Report (SCE 2024), the June Lake Census Designated Place is not an environmental justice community. Therefore, long-term operation and maintenance of the Project would not have any disproportionate effects on low-income or minority populations.

#### 9.3.13.7 Environmental Measures

Implementation of operation and maintenance activities under the Proposed Action would have no effect on socioeconomics; therefore, no environmental measures are proposed.

#### 9.3.13.8 Unavoidable Adverse Effects

There are no unavoidable adverse socioeconomic effects under the Proposed Action.

#### 9.3.13.9 References

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.

SCE (Southern California Edison Company). 2024. Draft EJ 1 – Environmental Justice Technical Study Report. August. Available in Supporting Document A of the Application for New License.

## TABLE OF CONTENTS

Page

9.3.14 Air Quality – Operation and Maintenance Effects ..... 9.3.14-1
9.3.14.1 Approach to Analysis ..... 9.3.14-1
9.3.14.2 Criteria Pollutant, Fugitive Dust, and GHG Emissions ..... 9.3.14-1
9.3.14.3 Environmental Measures ..... 9.3.14-2
9.3.14.4 Unavoidable Adverse Effects ..... 9.3.14-2
9.3.14.5 References ..... 9.3.14-3

## LIST OF TABLES

Table 9.3.14-1. Qualitative Discussion of Maintenance Activities Required under the No-Action Alternative Compared to the Proposed Action ..... 9.3.14-5

## LIST OF ACRONYMS

| | |
|---|---|
| DPM | diesel particulate matter |
| GHG | greenhouse gas |
| ROG | reactive organic gas |
| Project | Rush Creek Project |
| SCE | Southern California Edison Company |

### 9.3.14 Air Quality – Operation and Maintenance Effects

This section describes the potential effects to air quality that could occur because of continued operation and maintenance activities to be implemented under the Proposed Action for Southern California Edison Company's (SCE) Rush Creek Project (Project). A description of operation and maintenance activities to be implemented under the Proposed Action is included in Section 5.

Potential effects are determined by analyzing the changes in air quality that may result from activities to be implemented under the Proposed Action compared to the No-Action Alternative (existing condition) (Section 4). Final effects determinations consider environmental measures, management, and monitoring plans (environmental measures) to be included under the Proposed Action (refer to Section 5, Appendix 5-C). Unavoidable adverse effects are discussed at the end of this section.

The following potential effects to air quality because of continued operation and maintenance activities were evaluated:

- Potential effects of ongoing operation and maintenance on air quality.

#### 9.3.14.1 Approach to Analysis

To evaluate the long-term, operational impacts of continued operation and maintenance of the Project, maintenance activities were qualitatively evaluated to determine whether there would be greater, fewer, or no change in expected air quality and greenhouse gas (GHG) emissions under the Proposed Action as compared to the No-Action Alternative.

#### 9.3.14.2 Criteria Pollutant, Fugitive Dust, and GHG Emissions

The Project includes: three dams and associated reservoirs—Rush Meadows Dam (Waugh Lake), Gem Dam (Gem Lake), and Agnew Dam (Agnew Lake); a water conveyance system; the Rush Creek Powerhouse; and ancillary facilities. With the exception of the Rush Creek Powerhouse, which is accessible from State Route 158, Project facilities are located in a remote backcountry area with no roads and must be accessed via the Rush Creek Trail (on foot or via mule) or via the Agnew or Gem trams (incline railroads operated by a cable hoist system). Each Project facility requires routine inspection and maintenance activities, as summarized in the No-Action Alternative column in Table 9.3.14-1.

The primary sources of emissions during Project operations and maintenance activities would be from mobile sources; heavy equipment use; and architectural coatings. Staff commutes in passenger vehicles to and from the Project powerhouse would result in vehicle exhaust emissions from the combustion of fuel.[1] Similarly, the delivery and removal of materials to or from the Project powerhouse (i.e., rip-rap for trail stabilization; transport of construction equipment, etc.) using passenger vehicles or heavy-duty diesel

[1] The only Project facility directly accessible by vehicle is the powerhouse. However, to access all other Project facilities, it is expected that staff would park at the powerhouse.

trucks would also result in vehicle exhaust emissions. Constituents of vehicle exhaust include ozone precursors (nitrogen oxides and reactive organic gas [ROG]) carbon monoxide, GHGs, and, if using diesel fuel, diesel particulate matter (DPM) (CARB 2024a). Heavy equipment would be used periodically during operations and maintenance activities (i.e., aerial lifts for work on power line maintenance; cranes/hoists for woody debris removal; welding equipment for facility repairs, etc.). Heavy equipment is often fueled by diesel, the combustion of which generates DPM emissions. Lastly, architectural coating and some cleaning activities included as regular Project maintenance are expected to result in evaporative ROG emissions from the solvents typically included in paints and coatings (CARB 2024b).

Following implementation of Project facility modifications, Rush Meadows Dam and Agnew Dam would be partially removed such that the dams no longer impound water, and hydroelectric operations at Rush Meadows and Agnew dams (including associated ancillary support facilities) would be discontinued. Gem Dam would be retrofitted to facilitate compliance with the seismic restrictions under a probable maximum flood event with a new spillway and reduced dam height. Under the Proposed Action, hydroelectric operations at Gem Dam and Rush Creek Powerhouse would continue, and changes to the Rush Creek Powerhouse would not occur. Routine inspection and maintenance activities would continue to be implemented at Gem Dam and Rush Creek Powerhouse as described in the No-Action Alternative (Section 4). However, following implementation of Project facility modifications, inspection and maintenance activities would be discontinued at Project facilities that are removed.

A net reduction in maintenance demands would occur following implementation of the Project facility modifications, as described in further detail in Table 9.3.14-1. As a result, a net reduction in air quality and GHG emissions associated with operation and maintenance activities would occur under the Proposed Action as compared to the No-Action Alternative.

### 9.3.14.3 Environmental Measures

Implementation of operation and maintenance activities under the Proposed Action would have no effect on air quality; therefore, no environmental measures are proposed.

### 9.3.14.4 Unavoidable Adverse Effects

There are no unavoidable adverse effects to air quality from continued operation and maintenance of the Project under the Proposed Action.

### 9.3.14.5 References

CARB (California Air Resources Board). 2024a. Car & Bus Exposure Studies. Available online at: https://ww2.arb.ca.gov/resources/documents/car-bus-exposure-studies#:~:text=Pollutants%20from%20vehicle%20exhaust%20include%20carbon%20monoxide%20%28CO%29%2C,ultrafine%20particles%20%28UFP%29%2C%20and%20volatile%20organic%20compounds%20%28VOCs%29. Accessed June 2024.

_____. 2024b. Architectural Coatings. Available online at: https://ww2.arb.ca.gov/our-work/programs/coatings/architectural-coatings. Accessed June 2024.

# TABLES

**Table 9.3.14-1. Qualitative Discussion of Maintenance Activities Required under the No-Action Alternative Compared to the Proposed Action**

| Maintenance Activity | No-Action Alternative | Changes under the Proposed Action | Change in Emissions |
|---|---|---|---|
| Powerhouse Inspection and Maintenance | SCE conducts an annual maintenance outage at the powerhouse. During the outage, SCE conducts comprehensive mechanical and electrical inspections, testing, and maintenance of the powerhouse appurtenances, as well as any repairs to Project penstocks as appropriate.<br>Mechanical and electrical testing may result in air quality emissions associated with the combustion of petroleum fuel and/or indirect emissions associated with electricity use. Air quality emissions may be generated during repairs, depending on the types of equipment used. In addition, mobile source emissions from SCE staff commutes to the Powerhouse would occur. | Changes to the Rush Creek Powerhouse would not occur as part of the Proposed Action. As a result, maintenance activities would remain the same as the No-Action Alternative, and a change in operational air quality and GHG emissions would not occur. | No Change |
| Powerhouse Complex Maintenance | Repairs to other buildings and ancillary facilities located within the powerhouse complex are made on an as-needed basis, including painting, building maintenance, and access road/bridge repairs.<br>Architectural coatings, such as building paints, are known to emit ozone precursors, such as ROG. Building maintenance and roadway/bridge repairs would likely require the use of heavy equipment powered by petroleum fuels, combustion of which would generate air quality and GHG emissions. In addition, mobile source emissions from SCE staff commutes to the powerhouse complex would occur. | Changes to the powerhouse complex, including ancillary and support facilities, would not occur as part of the Proposed Action. As a result, maintenance activities would remain the same as the No-Action Alternative, and a change in operational air quality and GHG emissions would not occur. | No Change |

| Maintenance Activity | No-Action Alternative | Changes under the Proposed Action | Change in Emissions |
|---|---|---|---|
| Flowline/Penstock and Valve House Inspections and Maintenance | Each quarter, SCE conducts physical inspection of the exterior of flowlines/penstocks (including valves, air valves, releases, and stand pipe) and valve houses. Minor repairs, including patching leaks and conducting valve house repairs (e.g., applying new paint, siding, and/or roofing) are made on an as-needed basis.<br>Architectural coatings, such as building paints, are known to emit ozone precursors, such as ROG. Valve house repairs may require the use of heavy equipment powered by petroleum fuels, combustion of which would generate air quality and GHG emissions. In addition, mobile source emissions from SCE staff commutes to the powerhouse would occur. | The Rush Meadows Dam Valve House, the Agnew Dam to Agnew Junction Flowline, and the Agnew Dam Valve House would be removed as part of the Proposed Action.<br>Because fewer facilities would require inspection and maintenance, a minor reduction in emissions is expected as compared to the No-Action Alternative. | Fewer |
| Dam Inspections, Testing, and Maintenance | To identify routine maintenance needs, SCE visually inspects all dams and appurtenances monthly. In addition, each year, intake grates are manually cleaned, and valves/low-level outlets are tested. Every five years, valves/low-level outlets are fully opened for testing.<br>Regular inspections would result in mobile source emission from SCE staff commutes. In addition, dam maintenance activities, such as re-painting and equipment repairs, may result in emissions associated with architectural coatings and petroleum fuel combustion. | The Rush Meadows Dam and Agnew Dam would be removed as part of the Proposed Action.<br>Because fewer facilities would require inspection and maintenance, a minor reduction in emissions is expected as compared to the No-Action Alternative. | Fewer |
| Tram Inspections and Maintenance | The Agnew and Gem trams (including tracks, ties, rollers, and cables) are inspected weekly when operational (approximately late May to late September) to ensure the tracks are clear and have no excess wear. | Changes to the Agnew and Gem trams, including hoist houses and supportive facilities, would not occur as part of the Proposed Action. As a result, maintenance activities would remain the same as the No-Action Alternative, and a change in operational air quality and GHG emissions would not occur. | No Change |

| Maintenance Activity | No-Action Alternative | Changes under the Proposed Action | Change in Emissions |
|---|---|---|---|
| Vegetation Management | Vegetation management occurs on an ongoing basis, and includes hand trimming, removing hazard trees, and applying herbicide.<br>Mobile emissions would occur from SCE maintenance staff commutes. Heavy equipment use for tree removal would result in emissions as well. | Several facilities would be removed as part of the Proposed Action.<br>Because a reduced acreage of land would require vegetation management, a minor reduction in emissions is expected as compared to the No-Action Alternative. | Fewer |
| Woody Debris Removal | SCE removes woody debris that builds up along the dams and has the potential to block spillways and low-level outlets. At Rush Meadows Dam, debris is flushed downstream. At Agnew Dam and Gem Dam, debris is hoisted from the water using heavy equipment, and burned on-site.<br>Mobile emissions would occur from SCE maintenance staff commutes. Using heavy equipment for hoisting debris would result in emissions and burning wood/vegetation would emit GHGs and particulate matter. | The Rush Meadows Dam and Agnew Dam would be removed as part of the Proposed Action. Thus, woody debris removal would no longer be required at the Rush Meadows Dam and Agnew Dam locations, and maintenance requirements would be reduced. Woody debris removal as Gem Dam would continue as it occurs under the No-Action Alternative.<br>Because two fewer dams would require woody debris removal, a minor reduction in emissions is expected as compared to the No-Action Alternative. | Fewer |
| Pest Management | Pest management occurs on an ongoing basis to prevent rodent infestations in Project facilities.<br>The only source of emissions associated with pest management activities would be mobile emissions from SCE maintenance staff commutes. | Several facilities would be removed as part of the Proposed Action.<br>Because fewer structures would require pest management, a minor reduction in emissions is expected as compared to the No-Action Alternative. | Fewer |
| Trail Maintenance | Project access trails are regularly inspected during normal Project activities. Repairs are conducted on an as-needed basis.<br>The only source of emissions associated with trail maintenance activities would be mobile emissions from staff commutes and material deliveries, as needed. | Rush Meadows Dam Access Trail would be removed as part of the Proposed Action. The Lower Gem Dam, Gem Dam Arch 8, Upper Gem Dam, and Agnew Stream Gage Access trails would be retained.<br>Although one of the six access trails would be closed, a substantial change in emissions would not occur as compared to the No-Action Alternative. | No Change |

| Maintenance Activity | No-Action Alternative | Changes under the Proposed Action | Change in Emissions |
|---|---|---|---|
| Power and Communication Line Maintenance | Power and communication line maintenance includes replacement of damaged poles on an as-needed basis.<br>The primary source of emissions associated with power and communication line maintenance activities would be mobile emissions from staff commutes. In addition, heavy equipment use, such as aerial lifts or welding equipment, would result in air quality and GHG emissions. | Two 4-kV power lines would be removed from the Agnew Dam Area; however, all other power and communication lines would remain as is with implementation of the Proposed Action.<br>Although two power lines would be removed, a substantial change in emissions would not occur as compared to the No-Action Alternative. | No Change |

Key:

GHG = greenhouse gas

kV = kilovolt

Project = Rush Creek Project

ROG = reactive organic gas

SCE = Southern California Edison Company

## TABLE OF CONTENTS

Page

9.3.15 Noise – Operation and Maintenance Effects ........................................... 9.3.15-1
9.3.15.1 Potential Noise Effects of Ongoing Operation and Maintenance...... 9.3.15-1
9.3.15.2 Environmental Measures ................................................................ 9.3.15-2
9.3.15.3 Unavoidable Adverse Effects .......................................................... 9.3.15-2
9.3.15.4 References....................................................................................... 9.3.15-2

## LIST OF ACRONYMS

| | |
|---|---|
| dB | decibel |
| Project | Rush Creek Project |
| SCE | Southern California Edison Company |
| SR-158 | State Route 158 |
| TSP | Technical Study Plan |
| TSR | Technical Study Report |

### 9.3.15 Noise – Operation and Maintenance Effects

This section describes the potential noise effects that could occur because of continued operation and maintenance activities to be implemented under the Proposed Action for Southern California Edison Company's (SCE) Rush Creek Project (Project). A description of operation and maintenance activities to be implemented under the Proposed Action is included in Section 5.

Potential effects are determined by analyzing the changes in noise that may result from activities to be implemented under the Proposed Action compared to the No-Action Alternative (existing condition) (Section 4). Final effects determinations consider environmental measures, management, and monitoring plans (environmental measures) to be included under the Proposed Action (refer to Section 5, Appendix 5-C). Unavoidable adverse effects are discussed at the end of this section.

The following potential noise effects associated with continued operation and maintenance activities were evaluated:

- Potential noise effects of ongoing operation and maintenance.

This section relies on data collected as part of noise studies conducted in 2023 as part of the LAND 2 – Noise Technical Study Plan (TSP). Components of the LAND 2 – TSP were not able to be completed in 2023. Specifically, to adequately describe the ambient noise environment, the TSP identified that ambient noise measurements be performed at each Point of Interest in June, August, and October – corresponding to the early, peak, and end of the recreational season, respectively. In the spring of 2023 local stakeholders expressed concern that the substantial snowpack in 2023 and associated high runoff created an ambient noise environment not representative of typical conditions. As a result, the June and August 2023 noise measurements were rescheduled for June and August 2024. Because power generation and creek flow rates had normalized by September 2023, the October 2023 measurements were conducted on schedule. Data collected in 2024 will be analyzed and reported following the end of the 2024 field season. Results from 2024 studies will be provided in an updated Technical Study Report (TSR) to be included in the Final License Application. In addition, this analysis will be updated, as appropriate, in the Final License Application.

#### 9.3.15.1 Potential Noise Effects of Ongoing Operation and Maintenance

The powerhouse is the only Project facility that, as a result of routine operation and maintenance, exposes sensitive receptors to noise. As described in Section 8.16, Noise Affected Environment, and detailed in the Draft LAND 2 – Noise TSR (LAND 2 – TSR; SCE 2024), nearby noise sensitive areas would continue to experience noise from a combination of equipment noise (from Rush Creek Powerhouse), natural sources of noise (from wind and water), and vehicle traffic (primarily on State Route 158 [SR-158]), as documented by the existing ambient noise measurements (LAND 2 – TSR, Table LAND 2-5 and Map LAND 2-1). The $L_{eq(10min)}$ noise levels that would be experienced at near or adjacent residential areas are anticipated to remain the same at approximately

59 decibels (dB) at PH-3 (southeast of powerhouse along SR-158), 42 dB at PH-4 (southeastern end of Washington Street), 41 dB at PH-5 (northeastern end of Washington Street), 43 dB at PH-6 (private driveway off of Nevada Street), 54 dB at PH-7 (Nevada Street northeast of powerhouse), and 53 dB at PH-8 (Nevada Street farthest northeast of powerhouse). The nature and quality of the noise from the powerhouse would remain typical of industrial-type equipment that would be experienced at the greatest levels in closest proximity to powerhouse complex, diminishing to background levels at further distances. Under the Proposed Action, powerhouse operation would not change. Powerhouse noise would remain consistent with existing conditions; therefore, there would be no effect.

For information about the contribution of the Rush Creek Powerhouse to existing ambient noise conditions refer to the LAND 2 – TSR (SCE 2024).

#### 9.3.15.2 Environmental Measures

Implementation of operation and maintenance activities under the Proposed Action would have no effect on noise levels in the vicinity of the Project (i.e., no change); therefore, no environmental measures are proposed.

#### 9.3.15.3 Unavoidable Adverse Effects

There are no unavoidable adverse noise effects from continued operation and maintenance of the Project under the Proposed Action.

#### 9.3.15.4 References

SCE (Southern California Edison Company). 2024. Draft LAND 2 – Noise Technical Study Report. August. Available in Supporting Document A of the Application for New License.

## TABLE OF CONTENTS

Page

9.3.16 Traffic – Operation and Maintenance Effects ........................................... 9.3.16-1
9.3.16.1 Potential Effects of Ongoing Operation and Maintenance on Traffic Levels and the Transportation Network................................ 9.3.16-1
9.3.16.2 Environmental Measures ................................................................ 9.3.16-1
9.3.16.3 Unavoidable Adverse Effects ......................................................... 9.3.16-1

## LIST OF ACRONYMS

| | |
|---|---|
| Project | Rush Creek Project |

## 9.3.16 Traffic – Operation and Maintenance Effects

This section describes the potential effects to traffic that could occur because of continued operation and maintenance activities to be implemented under the Proposed Action for Southern California Edison Company's Rush Creek Project (Project). A description of operation and maintenance activities to be implemented under the Proposed Action is included in Section 5.

Potential effects are determined by analyzing the changes in traffic that may result from activities to be implemented under the Proposed Action compared to the No-Action Alternative (existing condition) (Section 4). Final effects determinations consider environmental measures, management, and monitoring plans (environmental measures) to be included under the Proposed Action (refer to Section 5, Appendix 5-C). Unavoidable adverse effects are discussed at the end of this section.

The following potential effects to traffic because of continued operation and maintenance activities were evaluated:

- Potential effects of ongoing operation and maintenance on traffic levels and the transportation network.

### 9.3.16.1 Potential Effects of Ongoing Operation and Maintenance on Traffic Levels and the Transportation Network

Under the Proposed Action, long-term operation and maintenance activities would be reduced compared to the No-Action Alternative. Following construction activities, Rush Meadows and Agnew dams and associated facilities would be removed, would no longer require operation or maintenance actions, and the dam and ancillary facility sites would be restored. Refer to Section 9.2.16, Traffic – Construction Effects for a detailed analysis of construction (including restoration) effects from implementation of Project facility modifications. The reduction in Project facilities and long-term operation and maintenance activities would reduce traffic associated with the Proposed Action. Therefore, long term there would be no effect or a beneficial effect on traffic (due to reduced traffic) associated with the Proposed Action.

### 9.3.16.2 Environmental Measures

Implementation of operation and maintenance activities under the Proposed Action would have no effect or a beneficial effect on traffic; therefore, no environmental measures are proposed.

### 9.3.16.3 Unavoidable Adverse Effects

There are no unavoidable adverse effects to traffic from continued operation and maintenance of the Project under Proposed Action.

## TABLE OF CONTENTS

Page

10.0 Cumulative Effects ........ 10-1
10.1 References ........ 10-1

## LIST OF ACRONYMS

FERC Federal Energy Regulatory Commission

# 10.0 CUMULATIVE EFFECTS

According to the Council on Environmental Quality's regulations for implementing the National Environmental Policy Act (40 Code of Federal Regulations § 1508.7), a cumulative effect is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time, including hydropower and other land and water development activities.

The Federal Energy Regulatory Commission (FERC) did not identify any specific resources in its Scoping Document 2 (FERC 2022) that have the potential to be cumulatively affected by the proposed operation and maintenance of the Rush Creek Project.

Consistent with FERC's determination in Scoping Document 2, and through scoping, agency consultation, and an independent analysis, Southern California Edison Company did not identify any resources that would be cumulatively affected by relicensing the Rush Creek Project.

## 10.1 REFERENCES

FERC (Federal Energy Regulatory Commission). 2022. Scoping Document 2 for the Rush Creek Hydroelectric Project. May 27.

## TABLE OF CONTENTS

Page

11.0 Developmental Analysis ........ 11-1
- 11.1 No-Action Alternative ........ 11-1
- 11.2 Proposed Action Alternative ........ 11-1
- 11.3 Cost of Environmental Measures ........ 11-1
- 11.4 Comparison of Annual Project Benefits and Costs ........ 11-1

## LIST OF TABLES

Table 11-1. Summary of Annual Costs for the No-Action Alternative........ 11-3

Table 11-2. Summary of Annual Costs for the Proposed Action Alternative ........ 11-3

Table 11-3. Cost of New Environmental Measures, Management and Monitoring Plans to be Implemented under the Proposed Action ........ 11-4

Table 11-4. Comparison of Annual Project Benefits and Costs for the No-Action and Proposed Action Alternatives ........ 11-5

## LIST OF ACRONYMS

| | |
|---|---|
| FERC | Federal Energy Regulatory Commission |
| Project | Rush Creek Project |
| SCE | Southern California Edison Company |

# 11.0 DEVELOPMENTAL ANALYSIS

As specified in the Federal Energy Regulatory Commission's (FERC) content requirements at 18 Code of Federal Regulations § 5.18(b)(5)(ii)(E), this section compares costs associated with the No-Action Alternative with costs associated with the Proposed Action for the Rush Creek Project (Project). This analysis includes a comparison of economic benefits; costs of new environmental measures, management, and monitoring plans; and power generation between the alternatives.

The power and economic benefits of the Project will be refined as part of the Final License Application. In addition, the analysis in the Final License Application will include an estimate of the costs of environmental measures and a comparison of costs under Southern California Edison's (SCE) Proposed Action with those associated with the No-Action Alternative. In keeping with FERC policy as described in 72 FERC ¶ 61,027 (July 13, 1995), this economic analysis is based on current electric power cost conditions and does not consider future escalation of fuel prices in valuing the Project's power benefits. In most cases, electricity from hydropower would displace some form of fossil-fuels, solar, or wind generation, in which fuel cost is the largest component of the cost of electricity production.

## 11.1 No-Action Alternative

The No-Action Alternative represents the existing condition and is described in Section 4. Under the No-Action Alternative, SCE would continue to operate and maintain the Project as it currently does under the existing license. SCE would not provide any additional environmental programs or measures above those provided in the existing license. The annual operating cost—including operation and maintenance, depreciation, property taxes, administrative, and general costs associated with the existing Project—is approximately $2,767,978 (Table 11-1).

## 11.2 Proposed Action Alternative

The Proposed Action represents SCE's proposal for Project facility modifications and continued operation and maintenance of the Project under a new FERC license (Section 5). An estimate of the average annual operation and maintenance and annual levelized costs for the Proposed Action will be included in Table 11-2 of the Final License Application.

## 11.3 Cost of Environmental Measures

Under the Proposed Action, new environmental measures, management, and monitoring plans would be implemented, which are designed to protect or enhance environmental and cultural resources over the term of the new license. The annualized costs associated with implementation of the new environmental measures, management and monitoring plans will be included in Table 11-3 of the Final License Application.

## 11.4 Comparison of Annual Project Benefits and Costs

A summary of the annual Project benefits and costs for the No-Action Alternative and the Proposed Action will be provided in Table 11-4 of the Final License Application.

# TABLES

## Table 11-1. Summary of Annual Costs for the No-Action Alternative

| Cost Component | Annual Cost (2023$) |
|---|---|
| Capital Cost[1] | $0 |
| Environmental Measures[2] | $0 |
| Operation and Maintenance[3] | $1,746,190 |
| Depreciation[4] | $431,574 |
| Property Tax[5] | $185,172 |
| Administrative and General | $405,042 |
| **Total Expenses** | **$2,767,978** |

Notes:

1 Capital costs associated with existing Project facilities are included under Operation and Maintenance.

2 Costs associated with existing environmental measures are included under Operation and Maintenance.

3 This amount represents the actual operation and maintenance expense for the year 2023.

4 This amount represents the actual depreciation expense for the year 2023.

5 This amount represents the actual property tax expense for the year 2023.

## Table 11-2. Summary of Annual Costs for the Proposed Action Alternative

| Cost Component | Annual Cost (2023$) |
|---|---|
| Capital Cost (modified facilities) | *To be included in the Final License Application* |
| New Environmental Measures | |
| Operation and Maintenance | |
| Depreciation | |
| Property Tax | |
| Administrative and General | |
| **Total Expenses** | |

## Table 11-3. Cost of New Environmental Measures, Management and Monitoring Plans to be Implemented under the Proposed Action

| New Environmental Measure, Management and Monitoring Plans | Total Capital and One-time Costs (2023$) | Total Environmental Measures Costs (2023$) | Total Annualized Costs[1] (2023$) |
|---|---|---|---|
| **Aquatic Resources** | | | |
| Minimum Instream Flow Measure (modified) | *To be included in the Final License Application* | | |
| Recreation Reservoir Elevation Objectives Measure (modified) | | | |
| Stream and Reservoir Gaging Monitoring Plan (ongoing) | | | |
| Fish Stocking Measure (modified) | | | |
| *Subtotal* | | | |
| **Cultural Resources** | | | |
| Historic Properties Management Plan (modified) | *To be included in the Final License Application* | | |
| *Subtotal* | | | |
| **Terrestrial Resources** | | | |
| Vegetation Management Measure (new) | *To be included in the Final License Application* | | |
| *Subtotal* | | | |
| **Total** | | | |

Note:
[1] Total one-time capital costs plus total environmental measures costs annualized over the term of the new license (50 years).

## Table 11-4. Comparison of Annual Project Benefits and Costs for the No-Action and Proposed Action Alternatives

| Item | No-Action Alternative | Proposed Action Alternative |
|---|---|---|
| Installed Capacity (MW) | 13.01 | *To be included in the Final License Application* |
| Average Annual Generation (MWh)[1] | 33,022 | |
| Average Annual Energy Value ($/MWh) | $34.02 | |
| Annual Operation and Maintenance Cost (2023) | $2,767,978 | |
| Subtotal of Nominal Levelized Costs (based on annual operation and maintenance costs [$/MWh]) | $83.82 | |
| Annual Net Benefit (value of project power) | $1,123,408 | |

Note:

[1] The average annual energy for the No-Action Alternative is a 12-year average (2012–2023) representing current operations under the seismic restrictions.

Key:

MW = megawatt

MWh = megawatt hour

## TABLE OF CONTENTS

Page

12.0 Conclusions and Recommendations ..... 12-1
12.1 Comparison of Alternatives ..... 12-1
12.1.1 Proposed Action ..... 12-1
12.1.2 No-Action Alternative ..... 12-5
12.2 Recommended Alternative ..... 12-5
12.3 Unavoidable Adverse Effects ..... 12-6
12.4 Recommendations of Fish and Wildlife Agencies ..... 12-6
12.5 Consistency with Comprehensive Plans ..... 12-6
12.5.1 Documents Identified on FERC's List of Comprehensive Plans ..... 12-7
12.5.2 Other Relevant Management and Planning Documents ..... 12-9
12.6 References ..... 12-9

## LIST OF TABLES

Table 12-1. Relevant Comprehensive Management Plans ..... 12-11

## LIST OF ACRONYMS

| | |
|---|---|
| DSOD | Division of Safety of Dams |
| FERC | Federal Energy Regulatory Commission |
| FPA | Federal Power Act |
| MWh | megawatt hour |
| Project | Rush Creek Project |
| SCE | Southern California Edison Company |
| SNYLF | Sierra Nevada yellow-legged frog |
| YT | Yosemite toad |

# 12.0 CONCLUSIONS AND RECOMMENDATIONS

This section compares the developmental and non-developmental effects of the Proposed Action and the No-Action Alternative for the Southern California Edison Company's (SCE) Rush Creek Project (Project); identifies the recommended alternative; summarizes unavoidable adverse effects; discusses the recommendations of fish and wildlife agencies; and describes the Project's consistency with comprehensive plans.

## 12.1 COMPARISON OF ALTERNATIVES

This section includes a comparison of the developmental and non-developmental effects (resource conditions) resulting from operation and maintenance of the Project under the Proposed Action and the No-Action Alternative.

### 12.1.1 Proposed Action

Under the Proposed Action, hydroelectric operations at Rush Meadows and Agnew dams would be discontinued and these facilities (including associated ancillary support facilities) would be removed from the Federal Energy Regulatory Commission (FERC) license once all license conditions and regulatory requirements of FERC and other resource agencies are met. Gem Dam would be retrofitted to facilitate compliance with the seismic restrictions under a probable maximum flood event with a new spillway and reduced dam height. Under the Proposed Action, hydroelectric operations at Gem Dam and Rush Creek Powerhouse would continue under FERC jurisdiction consistent with conditions identified in a new FERC license.

Project facility modifications to be implemented under the Proposed Action are analyzed, by resource area, in Section 9.2, Construction Effects. During construction, SCE will implement resource protection measures (construction measures), including avoidance and protection measures and best management practices, to minimize effects (Appendix 5-B). Despite implementation of construction measures, temporary adverse construction effects related to aesthetics, recreation, socioeconomics, and noise were identified.

Operation and maintenance activities to be implemented under the Proposed Action are analyzed, by resource area, in Section 9.3, Operation and Maintenance Effects. SCE will implement environmental measures, management, and monitoring plans (environmental measures) during long-term operation and maintenance of the Project which are designed to protect, maintain, or enhance environmental and cultural resources over the term of the new license (Appendix 5-C). No unavoidable adverse effects from long-term operation and maintenance of the Project were identified.

Under the No-Action Alternative, current operations (Water Year 2012–2023), which represent operations post-implementation of the seismic restrictions, result in an annual average energy generation of 33,022 megawatt hours (MWh). The estimated water available for generation (annual average) under the Proposed Action would be approximately 1 percent less than under the No-Action Alternative resulting in an annual average energy generation of approximately 32,692 MWh. The loss of water available for generation under the Proposed Action is a result of removal of Rush Meadows Dam and storage capability in Waugh Lake, and implementation of the Recreation Reservoir Elevation Objectives Measures.

Overall, the Proposed Action protects and maintains resource conditions in the vicinity of the Project. Key considerations in developing the Proposed Action were to permanently modify Project facilities to meet dam safety requirements (i.e., FERC and California Department of Water Resources, Division of Safety of Dams [DSOD]), and ensure that future operation and maintenance of the Project protects power generation and system capability and reliability, while protecting and maintaining environmental and cultural resources in the vicinity of the Project.

The Proposed Action results in a benefit to resources compared to the No-Action Alternative, as identified below.

**Water Use and Hydrology**

- Benefits Rush Creek hydrology in the former Waugh Lake and downstream to Gem Lake by returning flows to natural unimpaired conditions.
- Benefits high-flow hydrology in Rush Creek downstream of Gem Dam to Grant Lake (including South Rush Creek) by slightly increasing the frequency of high-flow conditions (more consistent with unimpaired conditions).
- Maintains minimum instream flows downstream of Gem Dam and Agnew Lake (natural lake).
- Maintains reservoir levels in Gem Lake to support recreation.
- Maintains beneficial uses as defined by Lahontan Regional Water Quality Control Board and the Basin Plan.
- Maintains storage and power generation.

**Water Quality**

- Maintains water quality and water temperature.

**Fish and Aquatic Resources**

- Restores stream rearing and spawning habitat in the former Waugh Lake.
- Restores rainbow and brook trout populations and benthic species (macroinvertebrates, algae) in Rush Creek within the former Waugh Lake
- Removes a fish barrier on Rush Creek (i.e., Rush Meadows Dam).
- Maintains water quality for fish and aquatic resources.

- Maintains minimum instream flows below Gem Dam and Agnew Lake and reservoir elevation objectives in Gem Lake that provide fish and aquatic habitat.
- Maintains fish and aquatic species and their habitat in Rush Creek downstream of Gem Dam.
- Continues off-site fish stocking to mitigate for potential entrainment at Gem Lake.

**Botanical and Wildlife Resources**

- Protects whitebark pine through periodic surveys and reporting.
- Minimizes the spread or introduction of non-native invasive plant species.
- Protects special-status plants, special-status invertebrates, Sierra Nevada yellow-legged frog (SNYLF) and Yosemite toad (YT), raptors, and special-status mammals and game mammals.
- Improves Primary Constituent Elements of Critical Habitat for aquatic and upland habitats for SNYLF and YT.
- Increases the quantity and quality of suitable habitat (aquatic and upland habitat) for SNYLF and YT.
- Maintains prey availability for bald eagle and osprey.
- Maintains protective measures to reduce the potential risk of raptor electrocutions.
- Maintains/enhances habitat for riparian nesting birds.
- Protects special-status bats potentially roosting in Project facilities.
- Increases the amount of habitat and improves habitat connectivity for both special-status and game mammals.

**Geology and Soils**

- Protects soil resources and minimizes erosion.
- Reduces the potential for soil contamination.

**Geomorphology**

- Benefits geomorphology by returning unimpaired flows and natural channel maintenance processes to Rush Creek within the former Waugh lakebed.
- Re-establishes unimpaired flows and natural channel maintenance process in Rush Creek from the former Waugh Lake to Gem Lake.

- Maintains or slightly enhances geomorphic processes (sediment transport during higher flows) in Rush Creek from downstream of Gem Dam to Grant Lake.

- Increases transport of large woody debris.

**Wetland, Riparian, and Littoral Habitats**

- Enhances riparian habitat along the Rush Creek channel within Waugh Lake and below Rush Meadows Dam.

- Enhances wetland, riparian, and littoral habitats through restoration of the former Waugh lakebed and exposed inundation zones of Gem Lake and Agnew Lake.

- Benefits riparian vegetation through re-establishment of unimpaired flows into Gem Lake and implementation of restoration plans that allow for natural recruitment and subsequent riparian diversity.

- Increases riparian recruitment below Gem Dam from slightly higher and more frequent spill events.

- Protects wetland, riparian, and littoral habitats during maintenance activities.

- Reduces the potential spread or introduction of non-native invasive plant species to wetland, riparian, and littoral habitats.

**Land Use**

- Ensures that only land that is necessary for operation and maintenance of the Project is encompassed within the FERC Project boundary.

- Removes Project facilities from the Inyo National Forest.

- Maintains consistency with the Land Management Plan for the Inyo National Forest.

**Recreation Resources**

- Maintains recreation access and opportunities over the long-term.

**Aesthetics**

- Benefits visual quality and character over the long-term from removal of Rush Meadows and Agnew dams and associated facilities and implementation of restoration.

### Cultural and Tribal Resources

- Establishes protocols for protection and management of cultural and Tribal resources, including protection, identification, and National Register of Historic Places evaluation.
- Establishes protocols for environmental review of Project operations and maintenance activities to ensure protection of cultural and Tribal resources.

### Socioeconomics

- Maintains the local and regional economy over the long-term.
- Contributes to low-cost, renewable power availability for the local and regional population.

### Air

- Maintains air quality over the term of the new license.

### Traffic

- Maintains traffic and circulation over the term of the new license.

### Noise

- Maintains ambient noise levels over the term of the new license.

### 12.1.2 No-Action Alternative

The No-Action Alternative maintains the existing baseline conditions, with no additional benefits to resources (status quo). The Project would continue to operate under the current license conditions and FERC-mandated seismic restrictions. No new environmental or cultural measures would be implemented.

## 12.2 RECOMMENDED ALTERNATIVE

Section 4(e) of the Federal Power Act (FPA) requires FERC to, in addition to the power and development purposes for which licenses are issued, give equal consideration to the purposes of energy conservation; the protection, mitigation of damage to, and enhancement, of fish and wildlife (including related spawning grounds and habitat); the protection of recreational opportunities; the preservation of other aspects of environmental quality; and other beneficial public uses, including irrigation, flood control, water supply, and navigation. Further, Section 10(a) of the FPA requires that a project, as licensed, be in the judgment of the FERC, best adapted to a comprehensive plan for improving or developing a waterway for beneficial public purposes. The following describes the basis for selecting the Proposed Action as the preferred alternative.

FERC could choose the No-Action Alternative with a few additional mitigation measures as the preferred alternative. The status quo would be maintained and resources in the area would remain at current conditions, existing power generation would be maintained, and Project facilities would continue to not meet dam safety requirements. However, the Proposed Action is better adapted to a comprehensive plan for improving or developing a waterway for beneficial public purposes based on FERC's mandate under the FPA.

The Proposed Action is SCE's recommended alternative because: (1) issuance of a new hydropower license by FERC would allow SCE to continue operating the Project as a beneficial and dependable source of clean renewable electric energy; (2) the Project would be permanently modified to meet dam safety requirements (e.g., FERC and DSOD); (3) non-conforming Project facilities would be removed from the Ansel Adams Wilderness; (4) the natural hydrograph and unimpaired conditions would be returned to Waugh Lake and Rush Creek downstream of Rush Meadows Dam; and (5) it includes recommended measures that would protect, maintain, or enhance environmental and cultural resources in the vicinity of the Project.

### 12.3 UNAVOIDABLE ADVERSE EFFECTS

Unavoidable adverse effects to environmental resources as a result of implementation of the Proposed Action are identified by resource area in Section 9, Environmental Analysis.

### 12.4 RECOMMENDATIONS OF FISH AND WILDLIFE AGENCIES

The Proposed Action considers input from federal and state resource agencies, Native American Tribes, local governments, non-governmental organizations, local communities, and interested members of the public (collectively referred to as stakeholders) acquired during consultation activities completed for relicensing of the Project. No formal recommendations from fish and wildlife agencies have been submitted to date. Therefore, the Proposed Action represents only SCE's recommended environmental measures.

### 12.5 CONSISTENCY WITH COMPREHENSIVE PLANS

Section 10(a)(2)(A) of the FPA requires FERC to consider the extent to which a project is consistent with federal and state comprehensive plans for improving, developing, and conserving the waterways associated with a project. In addition, 18 Code of Federal Regulations § 5.6(b)(2) requires that a potential applicant exercise due diligence in determining what information exists that is relevant to describing a project's existing environment, including a review of federal and state comprehensive plans filed with FERC and listed on FERC's website.

The following describes the comprehensive plans that are relevant to the relicensing of the Project, based on a review of FERC's April 2024 List of Comprehensive Plans and a review of other relevant planning documents. The potential effects of the Proposed Action activities will be evaluated with respect to each of these comprehensive plans as the relicensing process proceeds. The purpose of the evaluation will be to ensure that Project operation and maintenance activities are consistent with the goals and objectives outlined in these comprehensive plans.

On April 27, 1988, FERC issued Order No. 481, establishing that FERC will accord FPA Section 10(a)(2)(A) comprehensive plan status to any federal or state plan that:

- Is a comprehensive study of one or more of the beneficial uses of a waterway or waterways;
- Specifies the standards, the data, and the methodology used; and
- Is filed with the Secretary of FERC.

### 12.5.1 Documents Identified on FERC's List of Comprehensive Plans

FERC currently lists 112 comprehensive management plans for the state of California. FERC's List of Comprehensive Plans (FERC 2024) includes 13 planning documents that are relevant to the Project. These plans, as cited in the April 2024 list, are identified below. In some cases, updated versions of these documents are available, and these are noted below with an asterisk (*) and the updated document is included for reference. The relevant plan goals and objectives, applicability to the Project, and Project compatibility are summarized in Table 12-1. No inconsistencies between these plans and Proposed Action operation and maintenance activities were found.

#### 12.5.1.1 Federal Plans

- Forest Service. 1982. Comprehensive Management Plan for the Pacific Crest National Scenic Trail. Portland, OR. January 18, 1982.
- Forest Service. 2001. Wilderness Management Plan for the Ansel Adams, John Muir, and Dinkey Lakes Wilderness: Inyo and Sierra National Forests. Pacific Southwest Region. April 2001.
- Forest Service. 2023. Land Management Plan for the Inyo National Forest. Pacific Southwest Region. May 2023.[1]
    - Correct version: Forest Service. 2019. Land Management Plan for the Inyo National Forest: Fresno, Inyo, Madera, Mono, and Tulare Counties, California; Esmeralda and Mineral Counties, Nevada. Pacific Southwest Region. September.
- Forest Service. 1989. Mono Basin National Forest Scenic Area Comprehensive Management Plan. Department of Agriculture, Bishop, California.

[1] FERC's List of Comprehensive Plans incorrectly cites the date of May 2023 for the Land Management Plan Inyo National Forest. The most current version of this document was effective November 2019.

- National Park Service.* The Nationwide Rivers Inventory. Department of the Interior, Washington, D.C. 1993.
  - Updated version: National Park Service. The Nationwide Rivers Inventory. Department of the Interior, Washington, D.C. July 2023. Online data available at: https://www.nps.gov/subjects/rivers/nationwide-rivers-inventory.htm
- U.S. Fish and Wildlife Service. n.d. Fisheries USA: The Recreational Fisheries Policy of the U.S. Fish and Wildlife Service. Washington, D.C.


#### 12.5.1.2 State Plans


- California Department of Fish and Game. U.S. Fish and Wildlife Service. 2010. Final Hatchery and Stocking Program Environmental Impact Report/Environmental Impact Statement. Sacramento, California. January 2010.
- California Department of Fish and Game.* 2007. California Wildlife: Conservation Challenges, California's Wildlife Action Plan. Sacramento, California. 2007.
  - Updated version: California Department of Fish and Wildlife. 2015. California State Wildlife Action Plan. Sacramento, California. 2015.
- California Department of Fish and Game. 2003. Strategic Plan for Trout Management: A Plan for 2004 and Beyond. Sacramento, California. November 2003.
- California Department of Fish and Wildlife. 2008. California Aquatic Invasive Species Management Plan. Sacramento, California. January 18, 2008.
- California Department of Parks and Recreation.* 1998. Public Opinions and Attitudes on Outdoor Recreation in California. Sacramento, California. March 1998.
  - Updated version: California Department of Parks and Recreation. 2014. Survey on Public Opinions and Attitudes on Outdoor Recreation in California. January.
- California Department of Parks and Recreation.* 1994. California Outdoor Recreation Plan. Sacramento, California. April 1994.
  - Updated version: California Department of Parks and Recreation. 2021. California's 2021-2025 Statewide Comprehensive Outdoor Recreation Plan.

- California State Water Resources Control Board.* 2016. Water Quality Control Plan for the Lahontan Region. South Lake Tahoe and Victorville, California. January 2016.
    - Updated version: California State Water Resources Control Board. 2021. Water Quality Control Plan for the Lahontan Region. North and South Basins. October.

### 12.5.2 Other Relevant Management and Planning Documents

Three additional management/planning documents that are not included on FERC's List of Comprehensive Plans were also identified as being relevant to the Project. These documents are identified below.

#### 12.5.2.1 Federal

- United States Fish and Wildlife Service. 2007. Recovery Plan for the Sierra Nevada Bighorn Sheep. California/Nevada Operations Office. Sacramento, California. September.

#### 12.5.2.2 Local

- Mono County. 2020. Mono County General Plan. Mono County Planning Division, Mammoth Lakes, CA. 2020.

- Mono County. 2010. June Lake Area Plan, Community Development Element and Plan Safety Element.

## 12.6 REFERENCES

FERC (Federal Energy Regulatory Commission). 2024. List of Comprehensive Plans. April. Available at: https://cms.ferc.gov/media/comprehensive-plans.

# TABLES

## Table 12-1. Relevant Comprehensive Management Plans

| Comprehensive Plan | Relevant Plan Goals and Objectives | Applicability to Project | Project Compatibility |
|---|---|---|---|
| Forest Service. 1982. Comprehensive Management Plan for the Pacific Crest National Scenic Trail. | Provide overall guidance, direction, and strategy for management of the Pacific Crest Trail, its use, and its significant resources. | The Forest Service maintains several trails in the vicinity of the Project. The Rush Creek Trail 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 and John Muir Trail. 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/John Muir Trail are outside the FERC Project boundary and operation and maintenance of the Project does not interfere with the objectives of this plan. |
| Forest Service. 2001. Wilderness Management Plan for the Ansel Adams, John Muir, and Dinkey Lake Wildernesses: Inyo and Sierra National Forests. | Programmatic direction that amends and supplements the wilderness management direction in the Inyo Forest Plan. Includes use goals and objectives, forest-wide standards and guidelines, management area direction, and monitoring and evaluation requirements. | A portion of the Project (Rush Meadows Dam, Waugh Lake, Gem Lake, and the upstream of Gem Dam) is located within the Ansel Adams Wilderness Area. | Project facilities were constructed before Congress' establishment of the Ansel Adams Wilderness Area.<br>When the Wilderness Act was enacted, it was well understood that the protection for existing private rights would extend to federally licensed hydropower projects. During the prior Project relicensing in the 1990s, both FERC and the Forest Service accepted the Project facilities as "non-conforming uses" because they were built before the establishment of the wilderness. |

| Comprehensive Plan | Relevant Plan Goals and Objectives | Applicability to Project | Project Compatibility |
|---|---|---|---|
| Forest Service. 2019. Land Management Plan for the Inyo National Forest. | Identifies long-term and overall desired conditions and provides general direction for achieving those desired conditions.<br>Includes six components that guide future Project and activity decision-making: desired conditions, objectives, standards, guidelines, suitability of lands, and goals. | Land ownership within and adjacent to the Project is predominantly composed of federal lands administered by the INF. | SCE coordinates with the INF to operate the Project in a way that is consistent with relevant desired conditions and guidelines described in the INF Land and Resource Management Plan. |
| Forest Service. 1989. Mono Basin National Forest Scenic Area Comprehensive Management Plan. | Establishes management objectives for the Mono Basin scenic area. | The Project is 14 miles upstream of Mono Lake. | While upstream, the Project is not within the boundaries of this management plan. |
| NPS. 2023. The Nationwide Rivers Inventory. | The NRI is a listing of more than 3,200 free-flowing river segments in the U.S. that are believed to possess one or more “outstandingly remarkable” natural or cultural values judged to be at least regionally significant, and hence, are potential candidates for inclusion in the National Wild and Scenic River System | 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. However, a river inventory was conducted as part of revising the INF Land Management Plan that recognized the inclusion 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 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 | Should any segments of Project waters be listed in either the NRI or the National Wild and Scenic River System, SCE will adhere to all regulatory requirements. |

| Comprehensive Plan | Relevant Plan Goals and Objectives | Applicability to Project | Project Compatibility |
|---|---|---|---|
| | | Scenic River eligibility affects future management decisions on the INF and it opens the possibility for future designation by Congress. | |
| USFWS. n.d. The Recreational Fisheries Policy of the USFWS. | To conserve, restore and enhance aquatic systems to provide for increased recreational fishing opportunities nationwide. | The creeks and reservoirs in the Project support both stocked and self-sustaining non-native trout fisheries, including brown trout, brook trout, and rainbow trout. | Creeks and reservoirs within the FERC Project boundary are utilized by angling recreationists throughout the summer.<br>SCE also stocks rainbow trout at Silver Lake (non-Project lake) every five years to offset fish entrainment at the powerhouse. |
| CDFG[1]; USFWS. 2010. Final Hatchery and Stocking Program Environmental Impact Report/Environmental Impact Report/Statement. | Continue rearing and stocking of fish from existing hatchery facilities for the recreational use of anglers and mitigation of habitat loss due to dam construction and blocked access to upstream spawning areas. | The creeks and reservoirs in the Project support both stocked and self-sustaining non-native trout fisheries, including brown trout, brook trout, and rainbow trout. | Creeks and reservoirs within the FERC Project boundary are utilized by angling recreationists throughout the summer.<br>SCE also stocks rainbow trout at Silver Lake (non-Project lake) every five years to offset fish entrainment at the powerhouse. |
| CDFW. 2015. California State Wildlife Action Plan. | Maintain and improve connectivity vital for sustaining ecosystems (including those relevant to vegetation, wildlife corridors, genetic permeability, water flow, floodplains [longitudinal and lateral] and groundwater)<br>Maintain and improve water quality (including temperature, chemistry, and pollutant/nutrient concentrations and dynamics) and water quality and availability vital for sustaining ecosystems and their attributes (including | Project lands and surrounding areas are primarily forested in character and provide migratory and permanent habitat for a wide range of species. | The intermixing of the vegetation communities in the vicinity of the Project provides complex habitat allowing wildlife to utilize many different plant communities throughout a great range of elevations.<br>The Project has no existing or proposed consumptive uses of water. Although water is stored in upstream reservoirs for power generation, there is no long-term net loss of water to downstream areas. |

| Comprehensive Plan | Relevant Plan Goals and Objectives | Applicability to Project | Project Compatibility |
|---|---|---|---|
| | ocean, lakes, rivers, streams, groundwater, and snowpack)<br>Maintain or improve hydrological regimes vital for sustaining ecosystems (including riverine, lacustrine, and estuarine hydrodynamics) | | |
| CDFG. 2004. Strategic Plan for Trout Management: A Plan for 2004 and Beyond. | Provides diverse angling and recreational opportunities. | The creeks and reservoirs in the Project support both stocked and self-sustaining non-native trout fisheries, including brown trout, brook trout, and rainbow trout. | Creeks and reservoirs within the FERC Project boundary are utilized by angling recreationists throughout the summer.<br>SCE also stocks rainbow trout at Silver Lake (non-Project lake) every five years to offset fish entrainment at the powerhouse. |
| CDFW. 2008. California Aquatic Invasive Species Management Plan. | Minimize and prevent the introduction and spread of aquatic invasive species into and throughout the waters of California. | Aquatic invasive species could be introduced to Project waters. | There are no invasive fish species identified in the vicinity of the Project.<br>SCE implements measures to minimize the potential for the spread of aquatic invasive species. |
| CDPR. 2014. Survey on Public Opinions and Attitudes on Outdoor Recreation in California. | Provide an understanding of the outdoor recreation demands, patterns, preferences, and behaviors of California residents is essential to develop policies, programs, services, access, and projections of future use. | Land ownership within and adjacent to the Project is primarily composed of public lands administered by the INF, which is under the jurisdiction of the Forest Service. A portion of the Project is located within Ansel Adams Wilderness Area. | The Project does not include any developed recreation facilities. However, dispersed recreation use, including camping and fishing, does occur at Project reservoirs and along Rush Creek within the FERC Project boundary. |

| Comprehensive Plan | Relevant Plan Goals and Objectives | Applicability to Project | Project Compatibility |
|---|---|---|---|
| CDPR. 2021. California's 2021-2025 Statewide Comprehensive Outdoor Recreation Plan. | Five-year plan that establishes grant priorities to address unmet needs for public outdoor recreation land throughout California. | Land ownership within and adjacent to the Project is primarily composed of public lands administered by the INF, which is under the jurisdiction of the Forest Service. A portion of the Project is located within Ansel Adams Wilderness Area. | The Project does not include any developed recreation facilities. However, dispersed recreation use, including camping and fishing, does occur at Project reservoirs and along Rush Creek within the FERC Project boundary. |
| SWRCB. 2019. Water Quality Control Plan for the Lahontan Region. North and South Basins. | Water Quality Objectives that apply to all surface waters. | Waterbodies within Project fall within the jurisdiction of the Lahontan Regional Water Quality Control Board. | Streams and reservoirs associated with the Project are of high quality and conform to regulatory water quality objectives and standards. No persistent, widespread water quality issues are present. |
| USFWS. 2007. Recovery Plan for the Sierra Nevada Bighorn Sheep. | To attain population sizes and geographic distribution of bighorn sheep in the Sierra Nevada that assure long-term viability of the overall population and thereby allow its delisting as an endangered species. | USFWS-designated Critical Habitat for the Sierra Nevada bighorn sheep (Unit 2, Mount Gibbs) is located approximately 1.2 miles east of the FERC Project boundary. | There are no known occurrences of this species in the FERC Project boundary or within 1 mile of the boundary. |
| Mono County. 2020. 2020 Mono County General Plan. | Establish policies to guide decisions on future growth, development, and conservation of natural resources in the unincorporated area of the county. | Portions of the Project (around the powerhouse complex) are on private land managed by Mono County. | The Project is consistent with the provisions contained in the General Plan. |

| Comprehensive Plan | Relevant Plan Goals and Objectives | Applicability to Project | Project Compatibility |
|---|---|---|---|
| Mono County. 2010. 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 Rush Creek Powerhouse Complex is located within the Silver Lake Meadow Area and is identified as an existing public facility. | The Project is consistent with the provisions contained in the June Lake Area Plan, which supplements the General Plan. |

Notes: [1] CDFG is the predecessor name to CDFW; state legislature changed the name to CDFW in January 2013.

Key: CDFG = California Department of Fish and Game
CDFW = California Department of Fish and Wildlife
CDPR = California Department of Parks and Recreation
FERC = Federal Energy Regulatory Commission
Forest Service = United States Forest Service
INF = Inyo National Forest
NPS = National Park Service
NRI = Nationwide Rivers Inventory
Project = Rush Creek Project
SCE = Southern California Edison Company
SWRCB = State Water Resources Control Board
USFWS = United States Fish and Wildlife Service

## TABLE OF CONTENTS

Page

13.0 Consultation Documentation.......... 13-1
13.1 Early Outreach Activities.......... 13-1
13.2 Pre-Application Document Development and Distribution .......... 13-3
13.3 Federal Energy Regulatory Commission Scoping .......... 13-3
13.4 Study Plan Development and FERC Study Plan Determination .......... 13-3
13.5 Technical Study Implementation.......... 13-4
13.5.1 Technical Study Reports.......... 13-5
13.6 Endangered Species Act Section 7 Consultation.......... 13-5
13.7 National Historic Preservation Act Section 106 Consultation.......... 13-6
13.7.1 Cultural Technical Working Group Meetings.......... 13-7
13.7.2 Meetings With Tribal Governments.......... 13-8
13.8 Draft License Application Development and Distribution .......... 13-9
13.8.1 Comment Period .......... 13-10
13.9 Final License Application Development and Distribution .......... 13-10
13.10 References .......... 13-10

## LIST OF TABLES

Table 13-1. Parties Consulted in Preparation of the Application for New License .......... 13-12
Table 13-2. Resource Agency and Stakeholder Meeting Dates and Topics .......... 13-31
Table 13-3. Technical Working Group Meetings to Develop Technical Study Plans.......... 13-32
Table 13-4. Technical Working Group Meetings to Review Study Results[1] .......... 13-33
Table 13-5. Technical Study Report Distribution Dates .......... 13-34

## LIST OF ACRONYMS

| | |
|---|---|
| A/P | avoidance/protection |
| ACHP | Advisory Council on Historic Preservation |
| BMP | best management practice |
| CDFW | California Department of Fish and Wildlife |
| CFR | Code of Federal Regulations |
| ESA | Endangered Species Act |
| ESSLIA | East Shore Silver Lake Improvement Association, Inc. |
| FERC | Federal Energy Regulatory Commission |
| Forest Service | United States Forest Service |
| HPMP | Historic Properties Management Plan |
| INF | Inyo National Forest |
| ISR | Initial Study Report |
| NGO | non-governmental organization |
| NOI | Notice of Intent |
| NRHP | National Register of Historic Properties |
| PAD | Pre-Application Document |
| Project | Rush Creek Project |
| PSP | Proposed Study Plan |
| RSP | Revised Study Plan |
| SCE | Southern California Edison Company |
| SD1 | Scoping Document 1 |
| SD2 | Scoping Document 2 |
| SHPO | State Historic Preservation Officer |
| State Water Board | California State Water Resources Control Board |
| TSP | Technical Study Plan |
| TSR | Technical Study Report |
| TWG | Technical Working Group |
| USFWS | United States Fish and Wildlife Service |

# 13.0 CONSULTATION DOCUMENTATION

This section describes Southern California Edison Company's (SCE) consultation efforts completed for the relicensing of the Rush Creek Project (Project), organized by the following categories:

- Early Outreach Activities
- Pre-Application Document (PAD) Development and Distribution
- Federal Energy Regulatory Commission (FERC) Scoping
- Study Plan Development and FERC Study Plan Determination
- Technical Study Implementation
- Endangered Species Act – Section 7 Consultation
- National Historic Preservation Act – Section 106 Consultation
  - Consultation with Native American Tribes
- Draft License Application Development and Distribution
- License Measures Collaboration

Documents referred to in this section are available on either SCE's relicensing website at https://www.sce.com/regulatory/hydro-licensing/rush-creek or FERC's eLibrary at www.ferc.gov/docs-filing/elibrary.asp under Docket P-1389.

As required in Title 18 of the Code of Federal Regulations (CFR) § 5.18(b)(5)(ii)(G), Table 13-1 identifies the name and address of every federal, state, and interstate resource agency, Native American Tribe, or member of the public that SCE consulted during preparation of this Application for Relicensing for the Rush Creek Project.

Table 13-2 includes a list of resource agency and stakeholder meeting dates and topics that are identified throughout this section.

## 13.1 EARLY OUTREACH ACTIVITIES

SCE initiated outreach activities in early 2021. The intent of these early outreach activities was to identify potential stakeholders and local communities and understand their resource interests, describe Project facilities and operations to interested parties, and solicit existing resource information. Early outreach activities included the following:

- Developing a comprehensive distribution list of federal and state resource agencies, local governments, Native American Tribes, non-governmental organizations (NGO), and other interested parties (Table 13-1).

- To facilitate communication during the relicensing, SCE established a publicly accessible Internet website which can be accessed at https://www.sce.com/regulatory/hydro-licensing/rush-creek. The website serves as a repository for information on relicensing activities, including meeting notices and agendas; major filings by SCE or FERC; reference materials; key decision and action items; and links to relevant information sources.

- On March 11, 2021, SCE distributed an announcement notifying stakeholders and local communities of the upcoming relicensing for the Project.

- On March 15, 2021, SCE distributed a Project Information Questionnaire to stakeholders and local communities requesting assistance identifying existing, relevant, and reasonably available information to describe the existing Project environment; invited stakeholders and local communities to identify Project-related issues, concerns, or interests; and requested information on data gaps or additional information needs. SCE received responses from seven stakeholders. Five stakeholders identified general areas of interest and/or specific resource issues or concerns, including: United States Fish and Wildlife Service (USFWS); California Department of Fish and Wildlife (CDFW); Department of Water Resources – Division of Dam Safety; East Shore Silver Lake Improvement Association, Inc. (ESSLIA); and the June Lake Regional Planning Advisory Committee. Two stakeholders only provided contact information and interest in participation in the relicensing, including: National Park Service and the Advisory Council on Historic Preservation.

- SCE requested available data related to resources in the vicinity of the Project from resource agencies, as follows:

  - On April 26, 2021, SCE requested available data related to special-status species from the USFWS and CDFW.

  - On May 13, 2021, SCE requested various data from the United States Forest Service (Forest Service) related to cultural, terrestrial, fish and aquatic, and recreation resources.

- SCE conducted focused agency outreach meetings (virtual) to provide an overview of the Project, options under consideration under the Proposed Action, and the relicensing schedule. Specifically, SCE met with representatives of the Forest Service on April 30, 2021, and the California State Water Resources Control Board (State Water Board) on July 30, 2021.

- On October 19, 2021, SCE conducted two relicensing kick-off webinars (afternoon and evening) to discuss the upcoming relicensing process. The two webinars had identical agendas but were provided during both the day and night to offer greater opportunity for participation by federal and state resource agencies, local governments, Native American Tribes, NGOs, and other interested parties. The purpose of the webinars was to acquaint interested parties with FERC's Integrated

Licensing Process, including key milestones and opportunities for stakeholder participation. SCE also provided an overview of the existing Project; the Proposed Action under consideration in the relicensing proceeding; and the PAD.

## 13.2 PRE-APPLICATION DOCUMENT DEVELOPMENT AND DISTRIBUTION

On December 16, 2021, SCE filed a Notice of Intent (NOI) and PAD with FERC. The PAD provided FERC, federal and state agencies, and other interested parties with background information related to Project facilities, operations, and maintenance activities; summarized existing, relevant, and reasonably available information; defined pertinent Project issues; and identified potential study needs. The PAD also included 15 Draft Technical Study Plans (TSP).

## 13.3 FEDERAL ENERGY REGULATORY COMMISSION SCOPING

On February 14, 2022, FERC issued a Notice of Commencement of Pre-Filing Process and Scoping Document 1 (SD1) for the Project. SD1 provided interested parties with FERC's preliminary list of issues and alternatives to be addressed in a National Environmental Policy Act document analyzing potential conditions of a new Project license. Additionally, FERC requested that any party interested in providing comments on the PAD and SD1 and/or submitting formal study requests do so by April 15, 2022, in accordance with a 60-day comment period. During the comment period, FERC did not conduct any on-site scoping meetings due to restrictions on mass gatherings related to COVID-19, but did conduct two virtual scoping meetings on March 14, 2022, using a telephone conference line. The daytime meeting focused on concerns of resource agencies, Native American tribes, and NGOs while an evening meeting focused on receiving comments from the public. Nine entities filed comments, including two from SCE, on SD1. The FERC revised SD1 based on oral comments received at the scoping meetings and written comments received through the scoping process. FERC issued Scoping Document 2 (SD2) on May 27, 2022.

## 13.4 STUDY PLAN DEVELOPMENT AND FERC STUDY PLAN DETERMINATION

Following filing of the PAD, SCE convened a series of Technical Working Group (TWG) meetings during February, March, and April 2022 to review and refine the Draft Technical Study Plans, as appropriate. TWGs were organized by resource area: Aquatic Resources, Cultural and Tribal Resources, Land Resources, Recreation Resources, and Terrestrial Resources. TWG meetings included presentations of each TSP and dialogue with participants to answer comments/questions and discuss/address refinement of the study approach and methodologies. Both verbal and written comments were provided by the stakeholders. Based on the stakeholder comments, SCE revised the study plans, as necessary, to address comments and try to reach consensus. At the conclusion of the TWG meetings, SCE prepared Updated Draft Technical Study Plans and distributed these to meeting participants on April 5, 2022. Table 13-3 summarizes the TWG meetings held to develop the Technical Study Plans for each resource area.

Pursuant to 18 CFR § 5.11, on May 26, 2022, SCE filed a Proposed Study Plan (PSP) with FERC that included 15 TSPs for the Project. Stakeholders and local communities were afforded 90 days from the date of the PSP filing to provide comments on the PSP or to request additional studies. During the comment period, SCE conducted a virtual study plan meeting on June 16, 2022, with stakeholders and local communities to (1) provide an overview of the PSP; (2) discuss information gathering or study requests from stakeholders; and (3) attempt to resolve any outstanding issues with respect to SCE's PSP. Comments on the PSP were filed by the Forest Service, State Water Board, ESSLIA, and June Lake Regional Planning Advisory Committee (filed on behalf of themselves, Friends of the Inyo, American Rivers, and California Sportfishing Protection Alliance).

Pursuant to 18 CFR § 5.13(a), on September 23, 2022, SCE filed a Revised Study Plan (RSP) with FERC. The RSP addressed specific study plan comments made on the PSP either by modifying the previously filed TSPs included in the PSP or by providing a rationale for why a comment or new study request was not adopted. During the 20-day comment period, four comment letters were received on the RSP, including comments filed by the ESSLIA; State Water Board; Forest Service; and CDFW. In addition, on October 19, 2022, SCE filed responses to the stakeholder comments with FERC, which included a revised TERR 2 – Wildlife Resources TSP.

On October 26, 2022, FERC issued its Study Plan Determination with staff-recommended modifications. Of the 15 studies proposed by SCE, FERC approved 14 as filed, and one (TERR 2 – Wildlife TSP) approved with staff modifications. FERC staff also required preparation of two additional studies: an Environmental Justice Study (new study plan proposed by FERC) and a Full Project Decommissioning Study (stakeholder-requested study, as modified by FERC).

## 13.5 TECHNICAL STUDY IMPLEMENTATION

SCE began implementing the approved TSPs in 2023. Study progress was documented in SCE's Initial Study Report (ISR) filed with FERC on October 26, 2023. The ISR summarized SCE's overall progress through early October 2023 in implementing the study plans, including an explanation of any variances and modifications to ongoing studies. SCE held a virtual meeting on November 9, 2023 to discuss the contents of the ISR and to address comments regarding study plan implementation. The meeting discussion was documented in a meeting summary that SCE filed with FERC on November 21, 2023. Seven entities filed comments on the ISR Meeting Summary, including requests for study modifications. On January 24, 2024, SCE filed a Response to Comments on the Initial Study Report Meeting Summary.

On the evening of February 13, 2024, SCE hosted an in-person relicensing community meeting at the June Lake Community Center. During the meeting SCE shared the relicensing process and schedule and reviewed the plan and process for the coming months, including roll-out of the Technical Study Reports (TSR), opportunities to review and comment on report findings, and preparation of the Draft and Final License Applications.

On February 23, 2024, FERC issued a determination on requests for study modifications. Requested modifications to AQ 4 – Water Quality, AQ 6 – Fish Population and Barriers, and AQ 7 – Special-status Amphibians were approved with staff's recommended modifications.

### 13.5.1 Technical Study Reports

Study methods and results were compiled in a series of TSRs. Each TSR included the following information: (1) study objectives; (2) study area; (3) study approach and methods; (4) and study results. Prior to filing of this Draft License Application, several Draft TSRs were distributed to each relevant TWG for a 90-day review and comment period.[1] The remaining TSRs are being provided to stakeholders and local communities for a 90-day review and comment period as part of this Draft License Application filing. Table 13-4 summarizes the TWG meetings held to review the methodology and findings of each Draft TSR. A schedule showing when each Draft TSR was distributed to stakeholders and local communities (or is planned to be distributed) is provided in Table 13-5.

## 13.6 ENDANGERED SPECIES ACT SECTION 7 CONSULTATION

Pursuant to Section 7 of the federal Endangered Species Act (ESA), consultation with the USFWS is required when implementation of a project may affect the continued existence of a federally listed species. Species are defined as threatened or endangered by USFWS if they are listed in Title 50 of the CFRs (§§ 17.11 or 17.12). SCE's Section 7 consultation efforts are summarized below.

- SCE requested to be designated as the non-federal representative for the purpose of conducting informal Section 7 consultation with the USFWS on December 16, 2021. FERC granted SCE's request on February 14, 2022.
- On March 29, 2022, SCE consulted with the USFWS Division of Migratory Bird Management, National Raptor Program to obtain input on the avian survey methodology included in the TERR 2 – Wildlife Resources TSP.
- On April 11, 2022, SCE contacted the USFWS Migratory Bird Permit Office to obtain input on the avian survey methods for the TERR 2 – Wildlife Resources TSP.
- On April 19, 2022, SCE scheduled and attended a focus group meeting with CDFW and USFWS to review, revise and approve the avian survey methods included in the TERR 2 – Wildlife Resources TSP. USFWS representatives from the Migratory Bird and Eagle Management Programs were in attendance.
- On April 19, 2022, the USFWS Migratory Bird Program provided SCE with the contact information for the USFWS National Lead on birds and drones.
- SCE provided Draft TSPs to USFWS on September 23, 2022.

---

[1] The following Draft TSRs were not available in time for distribution to stakeholders prior to filing of the Draft License Application: CUL 1 – Built Environment, CUL 2 – Archaeology, TRI 1 – Tribal Resources, Parts 2 and 3 of the AQ 1 – Instream Flow TSR, and Parts B and C of the AQ 5 – Geomorphology TSR.

- On June 19, 2023, SCE e-mailed resource agencies, including USFWS, to identify special-status plant reference populations (to verify the timing of early season special-status plant surveys) and schedule the early season reference population site visit. On July 4, 2023, SCE e-mailed resource agencies to notify them of the timing of the early season reference population visit.

- On July 14, 2023, SCE e-mailed the results of the early season reference population visit and identified the timing of the early season botanical surveys based on the results.

- On August 15, 2023, SCE e-mailed resource agencies, including USFWS, to identify special-status plant reference populations and schedule the late season reference population site visit. On August 23, 2023, SCE e-mailed resource agencies to notify them of the timing of the late season reference population visit.

- On September 5, 2023, SCE e-mailed the results of the late season reference population visit and identified the timing of the late season botanical surveys based on the results.

- SCE provided TSRs to USFWS for review and comment on March 4, 2024, and March 29, 2024.

- SCE scheduled and attended a meeting with USFWS on May 29, 2024, to discuss ESA listed species and Critical Habitat and bald and golden eagles known or potentially occurring in the Project area (study results). SCE provided an overview of proposed construction best management practices (BMP) and long-term operation and maintenance avoidance/protection (A/P) measures. SCE and USFWS agreed that the analysis of effects of the Proposed Action on federally listed species and Critical Habitat and bald and golden eagle would be included in the Draft and Final License Applications and a Biological Assessment would not be required.

- Following filing of the Draft License Application, SCE will conduct a meeting with the USFWS to discuss comments on potential impacts to federally listed species and Critical Habitat, and proposed protection, mitigation, and enhancement measures.

## 13.7 NATIONAL HISTORIC PRESERVATION ACT SECTION 106 CONSULTATION

SCE's Proposed Action to relicense the Project, including partial removal of Agnew and Rush Meadows dams and retrofitting Gem Dam to allow for continued power generation, is considered an undertaking pursuant the National Historic Preservation Act of 1966, as amended, which requires federal agencies to take into account the effects of undertakings on historic properties and to provide the Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment on those undertakings. The ACHP's regulations implementing the procedures for Section 106, located at 36 CFR Part 800, note that federal agency officials shall make a "reasonable and good faith effort" to identify historic properties by considering previous planning, studies, and research, along with some other guidelines. An undertaking may have an adverse effect on historic properties when it directly or indirectly alters any of the characteristics of a historic property that qualify it for inclusion in the National Register of Historic Properties (NRHP) through diminishing of integrity.

FERC, as the lead federal agency, is responsible for Section 106 consultation and compliance, however, it has delegated some of its authority to SCE to coordinate these efforts (FERC letter dated to SCE February 14, 2022). FERC is responsible for government-to-government consultation with Native American Tribes. On January 19, 2022, FERC sent official Tribal Consultation Letters to federally recognized Tribes: Big Pine Paiute of Owens Valley, Bishop Paiute, Bridgeport Paiute Indian Colony, North Fork Rancheria of Mono Indians of California, Tuolumne Band of Me-Wuk Indians, Walker River Paiute Tribe, and Washoe Tribe of Nevada and California. FERC followed up with phone calls to Tribal Leaders and Tribal Historic Preservation Officers. SCE, as delegated by FERC, conducts informal consultation and outreach with both federally and non-federally recognized Native American Tribes as part of TSP implementation. SCE's Section 106 efforts and tribal outreach efforts are summarized below (details can be found in the TRI 1 – Tribal Resources TSR, to be filed with the Final License Application).

### 13.7.1 Cultural Technical Working Group Meetings

SCE's PAD included 15 TSPs addressing various types of resources, including CUL 1 – Built Environment TSP, CUL 2 – Archaeology TSP, and TRI 1 – Tribal Resources TSP. Following filing of the PAD, SCE conducted virtual meetings with the Cultural Resources TWG, which included Tribal governments, Tribal members, other cultural resources stakeholders, Forest Service representatives, and the Office of Historic Preservation. Meetings were held on February 9, February 28, and March 22, 2022, and comments were incorporated into revised TSPs. The CUL 1 – Built Environment TSP, CUL 2 – Archaeology TSP, and TRI 1 – Tribal Resources TSP were approved by FERC as part of its Study Plan Determination issued in October 2022.

TSP implementation occurred in 2023 and 2024. Draft TSRs were developed for CUL 1, CUL 2, and TRI 1. These are in the process of being reviewed by stakeholders who can receive and review confidential cultural resources information (e.g., Inyo National Forest [INF], State Historic Preservation Officer [SHPO] and applicable Native American Tribes).

SCE currently implements a Historic and Archaeological Protection Plan and intends to develop a Historic Properties Management Plan (HPMP) after TSRs have been finalized and recommendations on eligibility for the NRHP have been determined. The HPMP will consider the direct and indirect effects to NRHP listed or eligible resources from continued operation and maintenance of the Project. The HPMP will incorporate results from cultural resource studies conducted for relicensing as well as concurrence on eligibility received from the SHPO. The HPMP will be developed in consultation with the INF, SHPO, and Native American Tribes and outline implementation procedures such as management roles and responsibilities, Native American and agency consultation, project review requirements, implementation protocols including annual meetings and reporting, as well processes for revision of the HPMP and dispute resolution. The HPMP will be utilized as a management tool to avoid potential adverse effects to historic properties.

Any Finding of *Adverse Effect* identified through the review of a proposed Project activity, including decommissioning plans or modification plans for Project facilities, will follow the Section 106 process pursuant to 36 CFR Part 800.5 *assessment of adverse effects* and 800.6 *resolution of adverse effects*. Resolution of an adverse effect, as provided in 36 CFR Part 800.6, requires notifying the ACHP; consulting with the SHPO, interested parties and land managing agencies; and developing a Memorandum of Agreement that outlines how adverse effect will be resolved.

### 13.7.2 Meetings With Tribal Governments

SCE emailed the following Tribal governments and groups in early 2022 inviting them to TWG meetings as part of TSP development. SCE sent a follow-up email on July 14, 2023, after FERC approved the TRI 1 – Tribal Resources TSP, with an invitation to participate in implementation of the TSP and provide an introduction of the technical team implementing the study. The following Tribal governments, listed in alphabetical order, were contacted:

- American Indian Council of Mariposa County (Southern Sierra Miwuk Nation)
- Big Pine Paiute Tribe of Owens Valley
- Bishop Paiute Tribe
- Bridgeport Indian Colony
- Mono Lake Kutzadika[a] (Kootzaduka'a) Tribe
- North Fork Mono Tribe of California
- North Fork Rancheria of Mono Indians
- Timbisha Shoshone Tribe
- Tuolumne Band of Me-Wuk Indians of the Tuolumne Rancheria of California
- Utu Gwaitu Paiute Tribe of the Benton Paiute Reservation, California
- Walker River Paiute Tribe
- Yosemite-Mono Lake Paiute
- Washoe Tribe of Nevada and California

The Antelope Valley Paiute Tribe, Coleville, and Yerington Paiute Tribe of the Yerington Colony and Campbell Ranch were not included because an email address or contact information was not found or an email bounced back.

Responses were received from ten Tribes and these are described in Section 8.13, Tribal Resources Affected Environment.

Additionally, informal correspondence in the form of phone calls, e-mails, site visits and video conferencing meetings were conducted with the Bishop Paiute Tribe, a member of Bishop Tribe who has Kutzadika[a] (Kootzaduka'a) ancestry, Mono Lake Kutzadika[a] (Kootzaduka'a) Tribal members and Yosemite-Mono Lake Paiute Indian Community. The purpose of this informal correspondence was to identify Tribal resources and interests within the Area of Potential Effects and study area.

The Tribal resource investigation made a good-faith effort at proper communication with Tribal leaders as laid out in FERC's *Policy Statement on Consultation with Indian Tribes in Commission Proceedings*, issued July 23, 2003 (Docket No. PL03-4-000; Order No. 635; FERC 2003). The investigation followed the FERC regulations at 18 CFR § 2.1c, which recently revised its policy statement on consultation with Tribes in FERC proceedings (FERC 2019).

## 13.8 DRAFT LICENSE APPLICATION DEVELOPMENT AND DISTRIBUTION

Pursuant to 18 CFR § 5.16, SCE is required to file a preliminary licensing proposal no later than 150 days prior to the deadline for filing a license application. As allowed under § 5.16(c), SCE elected to file a draft license application which includes the contents of a license application required by § 5.18 instead of the preliminary licensing proposal. The regulation at § 5.16(c) states that if an applicant elects to file a draft license application, a notice of its intent should be included in the updated study report.

The deadline to file a preliminary licensing proposal/draft license application for the Rush Creek Project is September 3, 2024. The updated study report is not due to be filed until October 26, 2024. Due to this disparity in the relicensing process schedule, and to satisfy the notification requirement under § 5.16(c), SCE filed a notice of its intent to prepare a draft license application with FERC on April 5, 2024.

As specified in § 5.18(b), this Exhibit E addresses the resources listed in the Pre-Application Document provided for in § 5.6; follows FERC's guidelines in "Preparing Environmental Documents: Guidelines for Applicants, Contractors, and Staff"; and meets the format and content requirements specified by FERC.

This Exhibit E provides the necessary technical information and analyses to identify and evaluate potential impacts of continued operation and maintenance of the Project and disposition of select Project facilities under the Proposed Action compared to the No-Action Alternative. In addition, the Exhibit E specifies new measures under the Proposed Action to protect and enhance environmental and cultural resources. The Proposed Action in this Exhibit E considers input from state and federal resource agencies, Native American Tribes, NGOs, and members of the public (collectively referred to as stakeholders) acquired during consultation activities completed for the relicensing of the Project.

An electronic version of the Draft License Application, excluding Critical Energy Infrastructure Information and Confidential information, is available on SCE's public relicensing website at https://www.sce.com/regulatory/hydro-licensing/rush-creek or from FERC's eLibrary at https://www.ferc.gov/ferc-online/elibrary. In addition, the Draft License Application can be viewed electronically during business hours at the June Lake Library located at 90 West Granite Avenue, June Lake, California 93529. Any interested party may request an electronic copy of public portions of the Draft License Application by contacting Matthew Woodhall, SCE Relicensing Project Manager, by phone at (909) 362-1764 or via e-mail at matthew.woodhall@sce.com.

### 13.8.1 Comment Period

Concurrent with the filing of this Draft License Application with FERC, SCE also notified Project stakeholders and local communities on the distribution list of its filing and availability for a 90-day review and comment period.

SCE will address comments provided on the Draft License Application, as appropriate, in the Final License Application, which will be filed with FERC and concurrently distributed to stakeholders and local communities on or before January 31, 2025, two years prior to the license expiration date.

## 13.9 Final License Application Development and Distribution

*This section to be included in the Final License Application.*

## 13.10 References

FERC (Federal Energy Regulatory Commission). 2003. *Policy Statement on Consultation with Indian Tribes in Commission Proceedings*. Issued July 23, 2003, Docket No. PL03-4-000; Order No. 635.

———. 2019. *Revision to Policy Statement on Consultation With Indian Tribes in Commission Proceedings, 18 CFR 2 (October 10, 2019).*

# TABLES

## Table 13-1. Parties Consulted in Preparation of the Application for New License

| Organization | Name/Title | Mailing Address | Email Address |
|---|---|---|---|
| **Federal/State/Local Agencies** | | | |
| Advisory Council on Historic Preservation | Rachel Mangum, Assistant Director | 401 F Street NW, Suite 308<br>Washington, DC 20001-2637 | rmangum@achp.gov |
| Bonneville Power Administration | Scott Wilson, Account Executive | P.O. Box 3621<br>Portland, OR 97208-3621 | skwilson@bpa.gov |
| Bureau of Indian Affairs | Amy Dutschke, Regional Director | 2800 Cottage Way<br>Sacramento, CA 95825 | amy.dutschke@bia.gov |
| Bureau of Indian Affairs | Darryl LaCounte, Director | 1849 C Street NW MS-2624 MIB<br>Washington, DC 20240 | Darryl.lacounte@bia.gov |
| Bureau of Reclamation | Ernest Conant, Regional Director, California-Great Basin | 2800 Cottage Way<br>Sacramento, CA 95825-1886 | ECONANT@usbr.gov |
| Bureau of Reclamation | Pacific Northwest Region | 1150 N Curtis Rd<br>Boise, ID 83706-1234 | pninfo@usbr.gov |
| California Conservation Corps | Angel Lizaola, Conservationist Supervisor | 1824 Commercenter Circle<br>San Bernardino, CA 92408 | angel.lizaola@ccc.ca.gov |
| California Conservation Corps | Bruce Saito, Director | 1719 24th Street<br>Sacramento, CA 95816-7114 | Exec@ccc.ca.gov |
| California Department of Conservation | David Shabazian, Director | MS 24-01<br>801 K Street<br>Sacramento, CA 95814-3500 | david.shabazian@conservation.ca.gov |
| California Department of Fish and Wildlife | Beth Lawson | | Beth.Lawson@wildlife.ca.gov |
| California Department of Fish and Wildlife | Graham Meese | CDFW- Inland Deserts Region 6<br>Habitat Conservation Program Supervisor<br>787 North Main Street Suite 220<br>Bishop, CA 93514 | Graham.Meese@Wildlife.ca.gov |

| Organization | Name/Title | Mailing Address | Email Address |
|---|---|---|---|
| California Department of Fish and Wildlife | Michael Tovar | CDFW- Inland Deserts Region 6<br>Habitat Conservation Program Supervisor<br>787 North Main Street Suite 220<br>Bishop, CA 93514 | Michael.Tovar@Wildlife.ca.gov |
| California Department of Fish and Wildlife, Region 6 | Brandy Wood | 787 North Main Street, Suite 220<br>Bishop, CA 93514 | brandy.wood@wildlife.ca.gov |
| California Department of Fish and Wildlife, Region 6 | Nick Buckmaster | 787 North Main Street, Suite 220<br>Bishop, CA 93514 | Nick.Buckmaster@wildlife.ca.gov |
| California Department of Fish and Wildlife, Region 6 | Patricia Moyer | 787 North Main Street, Suite 220<br>Bishop, CA 93514 | Patricia.Moyer@wildlife.ca.gov |
| California Department of Forestry & Fire Protection | Matthew Reischman | P.O. Box 944246<br>Sacramento, CA 94244-2460 | matthew.reischman@fire.ca.gov |
| California Department of Parks and Recreation | | P.O. Box 942896<br>Sacramento, CA 94296-0001 | info@parks.ca.gov |
| California Department of Transportation | Clint Weier, CMAS | 500 South Main Street<br>Bishop, CA 93514-3423 | clint.weier@dot.ca.gov |
| California Department of Water Resources | Director | P.O. Box 942836, Room 1115-1<br>Sacramento, CA 94236-0001 | karla.nemeth@water.ca.gov |
| California Natural Resources Agency of California | | Room 1311<br>1416 9th Street<br>Sacramento, CA 95814-5511 | secretary@resources.ca.gov |
| California Office of Attorney General | | P.O. Box 944255<br>Sacramento, CA 94244-2550 | agpressoffice@doj.ca.gov |
| California Office of Historic Preservation | Brendon Greenaway | | brendon.greenaway@parks.ca.gov |
| California Office of Historic Preservation | Michael McGuirt | | michael.mcguirt@parks.ca.gov |
| California Office of Planning and Research | Saharnaz Mirzazad | | saharnaz.mirzazad@opr.ca.gov |
| California State Lands Commission | Executive Officer | 100 Howe Avenue, Suite 100 South<br>Sacramento, CA 95825 | Jennifer.Lucchesi@slc.ca.gov |
| California State Lands Commission | Lucinda Calvo, Senior Attorney | | lucinda.calvo@slc.ca.gov |

| Organization | Name/Title | Mailing Address | Email Address |
|---|---|---|---|
| California State Water Resources Control Board | Adam Cohen | | adam.cohen@waterboards.ca.gov |
| California State Water Resources Control Board | Dayne Kendrick | | dayne.kendrick@waterboards.ca.gov |
| California State Water Resources Control Board | Garrett Long | | Garrett.Long@Waterboards.ca.gov |
| California State Water Resources Control Board | Parker Thaler | P.O. Box 100<br>Sacramento, CA 95812-0100 | parker.thaler@waterboards.ca.gov |
| California State Water Resources Control Board | Rajaa Hassan | P.O. Box 100<br>Sacramento, CA 95812-0100 | rajaa.hassan@waterboards.ca.gov |
| Department of Safety of Dams | Andy Mangney, Field Branch Chief | 2720 Gateway Oaks Drive, Suite 300<br>Sacramento, CA 95833 | andy.mangney@water.ca.gov |
| Department of Safety of Dams | Bill Vogler, Senior Engineer | 2720 Gateway Oaks Drive, Suite 300<br>Sacramento, CA 95833 | william.vogler@water.ca.gov |
| Department of Safety of Dams | Shawn Jones, Assistant Division Chief | 2720 Gateway Oaks Drive, Suite 300<br>Sacramento, CA 95833 | shawn.jones@water.ca.gov |
| Federal Emergency Management Agency | Bob Fenton, Regional Administrator | 1111 Broadway, Suite 1200<br>Oakland, CA 94607-4052 | robert.fenton@fema.dhs.gov |
| Federal Energy Regulatory Commission | Chris Wang, Project Engineer | | christopher.wang@ferc.gov |
| Federal Energy Regulatory Commission | Evan Williams | | Evan.Williams@ferc.gov |
| Federal Energy Regulatory Commission | Everard Baker | | Everard.Baker@ferc.gov |
| Federal Energy Regulatory Commission | Frank Blackett, SF Regional Engineer | 100 1st St.<br>San Francisco, CA, 94105 | frank.blackett@ferc.gov |
| Federal Energy Regulatory Commission | Frank Winchell | 888 First Street, NE<br>Washington, DC 20426 | frank.winchell@ferc.gov |
| Federal Energy Regulatory Commission | Ousmane Sidibe | | Ousmane.Sidibe@ferc.gov |
| Federal Energy Regulatory Commission | Quinn Emmering | | quinn.emmering@ferc.gov |
| Federal Energy Regulatory Commission | Vinh Tran, SF Branch Engineer | 100 1st St.<br>San Francisco, CA, 94105 | vinh.tran@ferc.gov |
| Imperial Irrigation District | Sergio Quiroz, Interim General Manager | P.O. Box 937<br>Imperial, CA 92251-0937 | smquiroz@iid.com |

| Organization | Name/Title | Mailing Address | Email Address |
|---|---|---|---|
| Inyo County Fish Commission | Pat Gunsolley | | pgunsolley@gmail.com |
| Inyo County Supervisor, District 1 | Dan Totheroh | 215 Arcturis Circle<br>Bishop, CA 93514 | dtotheroh@inyocounty.us |
| Inyo County Supervisor, District 2 | Jeff Griffiths | 199 Edward Street<br>Bishop, CA 93514 | jgriffiths@inyocounty.us |
| Inyo County Supervisor, District 3 | Rick Pucci | P.O. Box 128<br>Bishop, CA 93514 | supervisor.pucci@gmail.com |
| Inyo-Mono Regional Water Management Program | Holly Alpert, Program Director | 1234 North Market Blvd.<br>Sacramento, CA 95834 | holly@inyo-monowater.org |
| Inyo-Mono Regional Water Management Program | Rick Kattelmann, Project Development Specialist | | rick@inyo-monowater.org |
| Los Angeles Department of Water & Power | Chad Lamacchia | | chad.lamacchia@ladwp.com |
| Los Angeles Department of Water & Power | Adam Perez | | adam.perez@ladwp.com |
| Los Angeles Department of Water & Power | Saeed Jorat | | Saeed.Jorat@ladwp.com |
| Los Angeles Department of Water & Power | David M. Livingston | 300 Mandich St, Bishop, CA 93514-2629 | david.livingston@ladwp.com |
| Los Angeles Department of Water & Power | Eric Tillemans | 301 Mandich Lane<br>Bishop, CA 93514 | eric.tillemans@ladwp.com |
| Mono County | Emily Fox, Deputy County Counsel | 4457 Highway 158 PO 303<br>June Lake, CA 93529<br>United States | efox@mono.ca.gov |
| Mono County | Shannon Kendall, Clerk of the Board | P.O. Box 715<br>Bridgeport, CA 93517 | BOS@mono.ca.gov |
| Mono County | Brent Calloway | | bcalloway@mono.ca.gov |
| Mono County Supervisor, District 3 | Paul McFarland | Mono County<br>1290 Tavern Road<br>PO Box 7657<br>Mammoth Lakes, CA 93546 | pmcfarland395@gmail.com |

| Organization | Name/Title | Mailing Address | Email Address |
|---|---|---|---|
| Mono County, Community Development Department | Wendy Sugimura, Community Development Department Director | P.O. Box 347<br>Mammoth Lakes, CA 93546 | wsugimura@mono.ca.gov |
| Mono County, Fish and Wildlife Commission | Gaye Mueller, Chair | | easternsierraartist@gmail.com |
| Mono County, Fish and Wildlife Commission | Jim King, Vice Chair | | jkrclr@gmail.com |
| Mono County, Sheriff's Department | Ingrid Braun, Sheriff | 49 Bryant Street<br>Bridgeport, CA 93517 | ibraun@monosheriff.org |
| National Park Service | Barbara Rice | | barbara_rice@nps.gov |
| National Park Service | Catherine Brown | | catherine_brown@nps.gov |
| NOAA National Marine Fisheries Service | Nancy Foster | 439 West York Street<br>Norfolk, VA 23510-1145 | NOAA.Ship.Nancy.Foster@noaa.gov |
| NOAA NWS Reno | Tim Bardsley | | tim.bardsley@noaa.gov |
| Regional Water Quality Control Board, Lahontan Region | Ed Hancock | 2501 Lake Tahoe Blvd<br>South Lake Tahoe, CA 96150 | ed.hancock@waterboards.ca.gov |
| Regional Water Quality Control Board, Lahontan Region | Jennifer Watts | 2501 Lake Tahoe Blvd<br>South Lake Tahoe, CA 96150 | jennifer.watts@waterboards.ca.gov |
| Tuolumne County Planning Division | Brian Bell | 48 Yaney Avenue<br>Sonora, CA 95370 | bbell@co.tuolumne.ca.us |
| US Army Corps of Engineers | Director | 1849 C Street NW Room 3238<br>Washington, DC 20240-0001 | hq-publicaffairs@usace.army.mil |
| US Army Corps of Engineers, Los Angeles District | Public Affairs | 915 Wilshire Blvd, Suite 930<br>Loca Angeles, CA 90017 | publicaffairs.spl@usace.army.mil |
| US Army Corps of Engineers, Sacramento District | William Ness | 1325 J Street<br>Sacramento, CA 95814-2928 | william.w.ness@usace.army.mil |
| US Army Corps of Engineers, San Francisco District | LTC John K. Baker, District Commander | 1455 Market Street, #1760<br>San Francisco, CA 94103 | cespn-regulatory-info@usace.army.mil |
| US Fish and Wildlife Service | Anne Mankowski | | anne_mankowski@fws.gov |
| US Fish and Wildlife Service | Kaylan Hager | | Kaylan_Hager@fws.gov |
| US Fish and Wildlife Service | Marcy Haworth | | marcy_haworth@fws.gov |

| Organization | Name/Title | Mailing Address | Email Address |
|---|---|---|---|
| US Fish and Wildlife Service | Thomas Dietsch, PhD | Migratory Bird Biologist<br>US Fish and Wildlife Service, Region 8<br>Carlsbad Fish and Wildlife Office<br>2177 Salk Ave, Suite 250<br>Carlsbad, CA 92008 | thomas_dietsch@fws.gov |
| US Fish and Wildlife Service - Reno Fish and Wildlife Office | Chad Mellison | 1340 Financial Blvd, Ste 234<br>Reno, NV 89502-7147 | RFWOmail@fws.gov |
| US Forest Service | Eric Rios-Bertado | | Eric.Rios-Bretado@usda.gov |
| US Forest Service | Jon Knight, Botanist | | jonathan.knight@usda.gov |
| US Forest Service | Mary Meagher, Botanist | | mary.meagher@usda.gov |
| US Forest Service | Randy Moore, Chief of the U.S. Department of Agriculture's Forest Service | | randy.moore@usda.gov |
| US Forest Service, Inyo National Forest, Mono Lake Ranger District | Adam Barnett, Public Services Staff Officer | 351 Pacu Ln Suite 200<br>Bishop, CA 93514 | adam.barnett@usda.gov |
| US Forest Service, Inyo National Forest | Courtney Rowe, Resource & Planning Staff Officer | 351 Pacu Ln Suite 200<br>Bishop, CA 93514 | courtney.rowe@usda.gov |
| US Forest Service, Region 5 | Andrew Lyons-Gould | | andrew.lyons-gould@usda.gov |
| US Forest Service, Region 5 | Ashley Blythe Haverstock, Archaeologist | 351 Pacu Ln Suite 200<br>Bishop, CA 93514 | ashley.blythehaverstock@usda.gov |
| US Forest Service, Region 5 | Dan Yarborough, Geospatial Program Mgt | 351 Pacu Ln Suite 200<br>Bishop, CA 93514 | daniel.yarborough@usda.gov |
| US Forest Service, Region 5 | Dawn Alvarez, Program Manager, Regional Hydropower Assistance Team | Forest Service<br>Region 5 Public Services RHAT<br>1323 Club Drive<br>Vallejo, CA 94592 | dawn.alvarez@usda.gov |
| US Forest Service, Region 5 | Jacqueline Beidl, Archaeologist | 351 Pacu Ln Suite 200<br>Bishop, CA 93514 | Jacqueline.beidl@usda.gov |
| US Forest Service, Region 5 | Jameisha Washington, Recreation Officer | | Jameisha.washington@usda.gov |
| US Forest Service, Region 5 | Michael Wiese | 507 E Line St D<br>Bishop, Ca 93514 | michael.wiese@usda.gov |

| Organization | Name/Title | Mailing Address | Email Address |
|---|---|---|---|
| US Forest Service, Region 5 | Nathan Sill, Biologist | | nathan.sill@usda.gov |
| US Forest Service, Region 5 | Sheila Irons, Forest Lands Specialist | P.O. Box 148<br>Mammoth Lakes, CA 93546 | sheila.irons@usda.gov |
| US Forest Service, Region 5 | Stephanie Heller, Restoration Hydrologist | | stephanie.heller@usda.gov |
| US Forest Service, Region 5 | Thomas Torres, Supervisor | | thomas.torres@usda.gov |
| US Forest Service, Region 5 | Todd Ellsworth, Water Program | 351 Pacu Ln Suite 200<br>Bishop, CA 93514 | todd.ellsworth@usda.gov |
| US Forest Service, Region 5 | Tristan Leong | | tristan.leong@usda.gov |
| US Forest Service, Region 5 | Tristan Leong, Hydroelectric Coordinator (RHAT) | Forest Service<br>Region 5 Public Services RHAT<br>1323 Club Drive<br>Vallejo, CA 94592 | Tristan.Leong@usda.gov |
| US Forest Service, Region 5 | Wilfred Nabahe, Tribal Relations Program Manager | 351 Pacu Ln Suite 200<br>Bishop, CA 93514 | Wilfred.Nabahe@usda.gov |
| US Geological Survey | Eric Reichard, Acting Regional Director | 345 Middlefield Road<br>Menlo Park, CA 94025 | egreich@usgs.gov |
| Yosemite National Park | Superintendent | P.O. Box 577<br>Yosemite National Park, CA 95389 | cicely_muldoon@nps.gov |
| **Native American Tribes and Tribal Groups** | | | |
| American Indian Council of Mariposa County (S. Sierra Miwuk National) | Sandra Chapman, Chairwoman | P.O. Box 186<br>Mariposa, CA 95338 | ssmiwuknation@gmail.com<br>sandra47roy@gmail.com |
| American Indian Council of Mariposa County (S. Sierra Miwuk National) | Waylon Coats, Vice Chairperson | P.O. Box 186<br>Mariposa, CA 95338 | Vicechair@southernsierramiwuknation.org |
| American Indian Council of Mariposa County (S. Sierra Miwuk National) | Jazzmyn Gegere (Brochini) Cultural Resource Preservation Department Manager and Tribal Monitor Coordinator | | preservation@southernsierramiwuknation.org |
| Antelope Valley Indian Community, Coville Paiute Tribe | Georgia Grace | | |

| Organization | Name/Title | Mailing Address | Email Address |
|---|---|---|---|
| Antelope Valley Indian Community, Coville Paiute Tribe | Chairperson or Tribal Administrator | | |
| Big Pine Paiute Tribe of Owens Valley | Danelle Gutierrez, Tribal Historic Preservation Officer | P.O. Box 700<br>Big Pine, CA 93513 | d.gutierrez@bigpinepaiute.org |
| Big Pine Paiute Tribe of Owens Valley | Sally Manning, Environmental Director | P.O. Box 700<br>Big Pine, CA 93513 | s.manning@bigpinepaiute.org |
| Bishop Paiute Tribe | Steven Orihuela | 50 Tu Su Lane<br>Bishop, CA 93514 | steven.orihuela@bishoppaiute.org |
| Bishop Paiute Tribe | Tilford Denver, Tribal Chair | 50 Tu Su Lane<br>Bishop, CA 93514 | tilford.denver@bishoppaiute.org |
| Bishop Paiute Tribe | Brian Poncho, Tribal Historic Preservation Officer | 50 Tu Su Lane<br>Bishop, CA 93514 | brian.poncho@bishoppaiute.org |
| Bishop Paiute Tribe | Meryl Picard, Chairperson | | meryl.picard@bishoppaiute.org |
| Bishop Paiute Tribe | Darren Delgado, Tribal Historic Preservation Officer | | darren.delgado@bishoppaiute.org |
| Bishop Paiute Tribe | Raymond Andrews | | kutzanuumu@yahoo.com |
| Bridgeport Paiute Indian Colony | Tribal Administrator | P.O. Box 37<br>Bridgeport, CA 93517 | admin@bridgeportindiancolony.com |
| Bridgeport Paiute Indian Colony | Debbie Lundy-Painter, Culture Coordinator | P.O. Box 37<br>Bridgeport, CA 93517 | culture@bridgeportindiancolony.com |
| Bridgeport Paiute Indian Colony | Herbert Glazier, Chairperson | P.O. Box 37<br>Bridgeport, CA 93517 | chair@bridgeportindiancolony.com |
| Death Valley Timbisha Shoshone Tribe | Margaret Cortez, Chairperson | 621 W Line St., Suite 109<br>Bishop, CA 93514 | one_mug@yahoo.com |
| Death Valley Timbisha Shoshone Tribe | Thomas Romero, Environmental Department | 621 W Line St., Suite 109<br>Bishop, CA 93514 | environmental@timbisha.com |
| Death Valley Timbisha Shoshone Tribe | Mandi Campbell, THPO | 621 W Line St., Suite 109<br>Bishop, CA 93514 | THPO@timbisha.com |
| Death Valley Timbisha Shoshone Tribe | Sookaaki (Charlie) Charley, Tribal Administrator/Acting THPO | 621 W Line St., Suite 109<br>Bishop, CA 93514 | administrator@timbisha.com |

| Organization | Name/Title | Mailing Address | Email Address |
|---|---|---|---|
| Fort Independence Indian Community of Paiute Indians | Carl Dahlberg, Chairperson | P.O. Box 67<br>Independence, CA 93526 | businesscommittee@fortindependence.com |
| Fort Independence Indian Community of Paiute Indians | Sean Scruggs, THPO | P.O. Box 67<br>Independence, CA 93526 | thpo@fortindependence.com;<br>falconkeeper22@gmail.com |
| Lone Pine Paiute-Shoshone Tribe | Katherine Bancroft, THPO | P.O. Box 40<br>Lone Pine, CA 93545 | patsiata@yahoo.com |
| Lone Pine Paiute-Shoshone Tribe | Mary Weuster, Chairperson | P.O. Box 747<br>Lone Pine, CA 93545 | chair@lppsr.org |
| Mono Lake Kutzadika'a Indian Community<br>Cultural Preservation Association | Raymond Andrews, President | P.O. Box 591<br>Bishop, CA 93515 | kutzanuumu@yahoo.com |
| Mono Lake Kutzadika'a Tribe | Charlotte Lange, Chairperson | P.O. Box 117<br>Big Pine, CA 93513 | char54lange@gmail.com |
| Mono Lake Kutzadika'a Tribe | Jocelyn Sheltraw, President of Mono Lake Kudadika'a Indian Community Cultural Preservation Association | | jsheltraw@monolaketribe.us |
| Mono Lake Kutzadika'a Tribe | Dean Tonenna, Vice President of Mono Lake Kudadika'a Indian Community Cultural Preservation Association | | dtonenna@gmail.com |
| Mono Lake Kutzadika'a Tribe | Angela Eddy | 884 Harry Street<br>Big Pine, CA 93513 | mono1paiute@gmail.com |
| North Fork Mono Tribe | Ron Goode, Chairman | 13396 Tollhouse Road<br>Clovis, CA 93619 | rwgoode911@hotmail.com |
| North Fork Rancheria of Mono Indians | Fred Beihn, Chairperson | | fbeihn@nfr-nsn.gov |
| North Fork Rancheria of Mono Indians | Christina McDonald, Vice Chairperson | | cmcdonald@northforkrancheria-nsn.gov |
| North Fork Rancheria of Mono Indians of California | Christina McDonald, Environmental Director | P.O. Box 869<br>North Fork, CA 93643 | cmcdonald@northforkrancheria-nsn.gov |
| North Fork Rancheria of Mono Indians of California | Elaine Fink, Tribal Chair | P.O. Box 869<br>North Fork, CA 93643 | efink@nfr-nsn.gov |

| Organization | Name/Title | Mailing Address | Email Address |
|---|---|---|---|
| Timbisha Shoshone Tribe | George Gholson, Tribal Chairman | 621 West Line St., Suite 109<br>Bishop, CA 93514 | george@timbisha.com |
| Timbisha Shoshone Tribe | Mandi Campbell, Tribal Historic Preservation Officer | | thpo@timbisha.com |
| Tuolumne Band of Me-Wuk Indians | Kat Cantrell | | kcantrell@mewuk.com |
| Tuolumne Band of Me-Wuk Indians | Jon Otterson, Tribal Administrator | P.O. Box 669<br>Tuolumne, CA 95379 | jon@mewuk.com |
| Tuolumne Band of Me-Wuk Indians | Reba Fuller, Government Affairs Specialist | P.O. Box 669<br>Tuolumne, CA 95379 | rfuller@mewuk.com |
| Tuolumne Band of Me-Wuk Indians of the Tuolumne Rancheria of California | Andrea Reich, Chairperson | | andrea@mewuk.com |
| Utu Utu Gwaitu Paiute Tribe<br>Benton Paiute Reservation | Shane Saulque, Tribal Chairperson (INT) and Vice Chair | 25669 Highway 6 PMBI<br>Benton, CA 93512 | shanesaulque@hotmail.com |
| Utu Utu Gwaitu Paiute Tribe<br>Benton Paiute Reservation | Sheri Saulque, Secretary/Treasurer | 25669 Highway 6 PMBI<br>Benton, CA 93512 | sherisaulque4069@gmail.com |
| Utu Utu Gwaitu Paiute Tribe<br>Benton Paiute Reservation | Dennis G. Chappabitty, Attorney at Law | 25669 Highway 6 PMBI<br>Benton, CA 93512 | dennis@chaplaw.us |
| Walker River Paiute Tribe | Amber Torres, Chairperson | P.O. Box 220<br>Schurz, NV 89427 | chairman@wrpt.org |
| Walker River Paiute Tribe | Linzey Scott, Tribal Historic Preservation Officer | | Lscott@wrpt.org |
| Yosemite-Mono Lake Paiute Indian Community | Lucy Parker, Representative | | lucy_basket4@yahoo.com |
| Yosemite-Mono Lake Paiute Indian Community | Melvin Brewster, Representative | | nativearchdoc@yahoo.com |
| Yosemite-Mono Lake Paiute Indian Community | David Andrews, Representative | P.O. Box 163523<br>Sacramento, CA 95816 | nayanake@comcast.net |

| Organization | Name/Title | Mailing Address | Email Address |
|---|---|---|---|
| **Non-Governmental Organizations and Other Interested Parties** | | | |
| Access Fund | Katie Goodwin | 54880 Highway 395<br>Lee Vining, CA 93541 | katie@accessfund.org |
| American Whitewater | Theresa Simsiman, Regional Coordinator | | Theresa@americanwhitewater.org |
| Braveheart | | P.O. Box 1625<br>Bishop, CA 93515 | |
| California HydroPower Reform Coalition | Kelly Catlett, Associate Western States Director | 2340 Brisbane Street<br>West Sacramento, CA 95691 | kelly@hydroreform.org |
| California Sportfishing Protection Alliance | Chris Shutes, FERC Projects Director | 1608 Francisco Street<br>Berkeley, CA 94703 | blancapaloma@msn.com |
| California Trout | Curtis Knight, General Contact | P.O. Box 3442<br>Mammoth Lakes, CA 93546 | Cknight@caltrout.org |
| California Trout | Sandra Jacobson, Sierra Headwaters Projects | | Sjacobson@caltrout.org |
| California Trout | Marrina Nation | | mnation@caltrout.org |
| Cardinal Village Resort | | 321 Cardinal Road<br>Bishop, CA 93514 | info@cardinalvillageresort.com |
| Double Eagle Resort | Ralph Lockhart, Owner | P.O. Box 731 B-736<br>June Lake, CA 93529 | rlockhart@doubleeagle.com |
| East Shore Silver Lake Improvement Association | Mark Shoemaker, President | 32151 River Island Drive<br>Springville, CA 93265 | shoemaker.mark@ymail.com |
| East Shore Silver Lake Improvement Association | Don Goffinet, Treasurer | 801 Allardice Way<br>Stanford, CA 94305 | goff@stanford.edu |
| East Shore Silver Lake Improvement Association | Ann Marie Mahoney | 8 Cresta Del Sol<br>San Clemente, CA | annmarie.mahoney@icloud.com |
| East Shore Silver Lake Improvement Association | Jil Stark, Executive Vice President | 890 East Harrison Avenue<br>Pomona, CA 91767-2003 | stark@fairplex.com |
| East Shore Silver Lake Improvement Association | | | mshoemaker@1stallied.com |
| East Shore Silver Lake Improvement Association | Daniel Mazmanian | | mazmania@usc.edu |

| Organization | Name/Title | Mailing Address | Email Address |
|---|---|---|---|
| East Shore Silver Lake Improvement Association | Jim Mahoney | 8 Cresta Del Sol<br>San Clemente, CA | jrmfinfree@aol.com |
| East Shore Silver Lake Improvement Association | Jim Ireton | 1803 La Cima<br>San Clemente, CA 92672 | jimireton@cox.net |
| East Shore Silver Lake Improvement Association | Linda Coffin | | linda@traveloe.com |
| East Shore Silver Lake Improvement Association | Steve Handy | | shandyman58@gmail.com |
| East Shore Silver Lake Improvement Association | Roger Getts | | roger.getts@pattondist.com |
| East Shore Silver Lake Improvement Association | Donald Getts | | gettsd@sbcglobal.net |
| Eastern Sierra Audubon Society | Hillary Behr, President | P.O. Box 624<br>Bishop, CA 93515 | president@esaudubon.org |
| Eastern Sierra Packers Association; Frontier Pack Train (Summer) | | P.O. Box 656<br>June Lake, CA 93529 | frontierpacktrain@gmail.com |
| Eastern Sierra Packers Association; Frontier Pack Train (Winter) | | 2095 Van Loon Lane<br>Bishop, CA 93514 | frontierpacktrain@gmail.com |
| Friends of Mono Lake Reserve | | P.O. Box 278<br>Bridgeport, CA 93517 | FOMLR@bodiefoundation.org |
| Friends of Silver Lake | John Wilt | 10363 Sportsman Court<br>Rancho Cordova, CA 95670<br>United States | jjwilt37@gmail.com |
| Friends of the Inyo | Ellen Wehr | | eltrescott@hotmail.com |
| Friends of the Inyo | Wendy Schneider | 819 North Barlow<br>Bishop, CA 93514 | wendy@friendsoftheinyo.org |
| Friends of the Inyo | Allison Weber, Forest and Water Campaigns Manager | 748 Fairway Cir,<br>Mammoth Lakes, CA 93546 | allison@friendsoftheinyo.org |
| Friends of the River | Executive Director | 1418 20th Street, Suite 100<br>Sacramento, CA 95811 | janndorman@friendsoftheriver.org |
| Friends of the River | Ron Stork | | Rstork@friendsoftheriver.org |

| Organization | Name/Title | Mailing Address | Email Address |
|---|---|---|---|
| Grant Lake Reservoir Marina | Doug Smith | P.O. Box 21<br>June Lake, CA 93529 | Dsmith@rossignol.com |
| Grant Lake Resort | Tony Hallum | 1 Grant Lake Resort<br>P.O. Box 627<br>June Lake, CA 93529 | management@grantlakeresort.com |
| Hydropower Reform | Sarah Lillie, Associate Director | 1101 14th Street NW, Suite 1400<br>Washington DC 20005 | sarah@hydroreform.org |
| Inyo-Mono Resource Conservation District | Hal Curti, President | 270 North See Vee Lane #6<br>Bishop, CA 93514-9624 | hal@curtiranch.com |
| June Lake Brewing | Sarah Walsh | PO Box 600, June Lake, CA 93529 | sarah@junelakebrewing.com |
| June Lake Loop Chamber of Commerce | | P.O. Box 2<br>June Lake, CA 93529 | |
| June Lake Loop Historical Society | | P.O. Box 104<br>June Lake, CA 93529 | |
| June Lake Motel | Lisa Oepkes | 2716 California 158 June Lake, CA | Reservations@JuneLakeMotel.com |
| Lake Front Cabins | L Nealand | 32 Brenner Street<br>June Lake, CA 93529 | info@summit-vacations.com |
| Lee Vining Chamber of Commerce | | P.O. Box 131<br>Lee Vining, CA 93541 | info@monolake.org |
| Mammoth Lakes Chamber of Commerce | Ken Brengle, Executive Director | P.O. Box 3268 2520 Main Street<br>Mammoth Lakes, CA 93546 | info@mammothlakeschamber.org |
| Michael K. Lerch & Associates | Mike Lerch | 319 Clanton Way Woodland, CA 95695 | mlerch.mkla@gmail.com |
| Mono Basin Historical Society | | | curator@monobasinhistory.org |
| Mono Basin Scenic Area Visitor Center | | 1 Visitor Center Drive<br>Lee Vining, CA 93541 | |
| Mono Lake Committee | Geoff McQuilkin, Executive Director | | geoff@monolake.org |
| Mono Lake Committee | Bartshe Miller, Eastern Sierra Policy Director | P.O. Box 29<br>Lee Vining, CA 93541 | bartshe@monolake.org |
| Mono Lake Committee | Greg Reis, Information and Restoration Specialist | P.O. Box 161<br>San Geronimo, CA 94963 | greg@monolake.org |

| Organization | Name/Title | Mailing Address | Email Address |
|---|---|---|---|
| Mono Lake Committee | Robert Di Paolo (he/him), Restoration Field Technician | Hwy 395 at Third Street, P.O. Box 29, Lee Vining, CA 93541 | robbie@monolake.org |
| Mono Lake Committee | Teri Tracy | P.O. Box 29<br>Corner of Hwy 395 & 3rd Street<br>Lee Vining, CA 93541 | ttracy@monolake.org |
| Northern California Power Agency | Sondra Ainsworth, Treasurer - Controller | 651 Commerce Drive<br>Roseville, CA 95678-6411 | sondra.ainsworth@ncpa.com |
| Owens Valley Committee | Mary Roper | P.O. Box 77<br>Bishop, CA 93515 | maryroper51@gmail.com |
| People for Mono Basin Preservation | Kathleen Maloney Bellomo | P.O. Box 217<br>Lee Vining, CA 93541 | hydroesq@schat.net |
| Planning and Conservation League | Howard Penn, Executive Director | 1107 Ninth St., Suite 360<br>Sacramento, CA 95814 | pclmail@pcl.org |
| Rainbow Pack Outfitters | Greg and Ruby Allen and Family | P.O. Box 1791<br>Bishop, CA 93515 | rainbowpackers@aol.com |
| Reverse Creek Lodge | David Naader | 52 S. Texas Street<br>June Lake, CA 93529 | reverse@qnet.com |
| Saddlebag Lake Resort / Tioga Pass Resort LLC | | P.O. Box 303<br>Lee Vining, CA 93541 | saddlebaglake@gmail.com |
| Sierra Business Council | Steve Frisch, President | 10183 Truckee Airport, Road #202<br>Truckee, CA 96161 | sfrisch@sierrabusiness.org |
| Sierra Club, Toiyabe Chapter | | 2101 Webster St., Suite 1300<br>Oakland, CA 94612 | chair@toiyabe.sierraclub.org |
| Sierra Club, Toiyabe Chapter, Range of Light Group | Mark Bagley, Owens River Watershed Conservation Chair | 53 S. Texas Street<br>June Lake, CA 93529 | markbagley02@gmail.com |
| Sierra Nevada Alliance | Jenny Hatch, Executive Director | P.O. Box 7989<br>South Lake Tahoe, CA 96158 | jenny@sierranevadaalliance.org |
| Sierra Nevada Big Horn Sheep Foundation | John Wehausen, Executive Director | P.O. Box 1183<br>Bishop, CA 93515 | |
| Silver Lake Resort | Andrew Jones | P.O. Box 116<br>6857 CA-158<br>June Lake, CA 93529 | silverlakeresortfamily@hotmail.com |

| Organization | Name/Title | Mailing Address | Email Address |
|---|---|---|---|
| Silver Lake Resort | Gary Jones | P.O. Box 116<br>6857 CA-158<br>June Lake, CA 93529 | silverlakeresortfamily@hotmail.com |
| Silver Lake Resort | Richard Yokovanderpool | P.O. Box 116<br>6857 CA-158<br>June Lake, CA 93529 | silverlakeresortfamily@hotmail.com |
| Southern Mono Historical Society | | 5489 Sherwin Creek Road<br>Mammoth Lakes, CA 93546 | events@mammothmuseum.org |
| South Western Power Group | David Getts, General Manager | 3610 N. 44th Street<br>Phoenix, AZ 85018<br>United States | dgetts@southwesternpower.com |
| TEAM Environmental | Naomi Jensen | 459 W. Line Street, Suite A<br>Bishop, CA 93514 | naomi@teambishop.com |
| The Nature Conservancy, California Field Office | | 201 Mission Street 4th Floor<br>San Francisco, CA 94105 | california@tnc.org |
| Tioga Lodge at Mono Lake | | P.O. Box 580<br>Lee Vining, CA 93541 | tiogalodge@gmail.com |
| Tioga Pass Resort | | 1887 Highway 120<br>Lee Vining, CA 93541 | tiogapassresortllc@gmail.com |
| Trout Unlimited | Mary Ann King, California Water Project Director | 5950 Doyle Street, Suite 2<br>Emeryville, CA 94608 | mking@tu.org |
| Trout Unlimited | Tiffanee Hutton | 15695 Donner Pass Rd, Suite 100<br>Truckee, CA 96161 | tiffanee.hutton@tu.org |
| Trout Unlimited, Eastern Sierra Chapter | Jessica Strickland, California Field Coordinator | P.O. Box 7399<br>Mammoth Lakes, CA 93546 | jstrickland@tu.org |
| Wildlife Conservation Board | Executive Director | 1416 9th Street<br>Sacramento, CA 95814-5511 | mary.ahern@wildlife.ca.gov |
| **Public** | | | |
| American Rivers | Meghan Quinn | 1813 Minniconjou Drive<br>South Lake Tahoe, CA 96150 | mquinn@americanrivers.org |
| Friends of the Inyo | Jora Fogg/ Jora Rehm-Lorber | | jora.rehm.lorber@gmail.com |
| Consultant | Craig Addley | | craig.addley@kleinschmidtgroup.com |

| Organization | Name/Title | Mailing Address | Email Address |
|---|---|---|---|
| JNA Consulting | Robyn Smith | | robyn@JNA-Consulting.com |
| JNA Consulting | Sara Reece | | Sara@JNA-Consulting.com |
| KG Consulting | Kate Kelly | | kate@kgconsulting.net |
| Frontier Pack Train | Kent Dohnel | 2095 Van Loon Lane<br>Bishop, CA 93514 | frontierpacktrain@gmail.com |
| Public | Bartshe Miller | Mono County | bzashe@gmail.com |
| Public | Bill Egan | | gardenofegan@suddenlink.net |
| Public | Carolyn and Ed Escoto | | beach2june@yahoo.com |
| Public | Dan McConnell | | danmcconnell55@gmail.com |
| Public | David Rosky | 88 Mt. View Lane<br>June Lake, CA 93529 | dave.rosky@gmail.com |
| Public | Dennis Boeher | Box 626 | plm2pne@gmail.com |
| Public | Dorothy Burdette | 891 Mono Drive<br>June Lake, CA 93529 | dodoburdette@gmail.com |
| Public | Duncan King | P.O. Box 235 200 Peeler Lake Drive<br>Lee Vining, CA 93541 | nosmog@yahoo.com |
| Public | Eric Badger | 122 Nevada Street<br>June Lake, CA 93529 | badger_eric@yahoo.com |
| Public | Harvey Lewis | P.O. Box 296<br>June Lake, CA 93529 | |
| Public | Ian Festers | | ian@mechdc.com |
| Public | Kevin Bundy | 396 Hayes St<br>San Francisco, CA 94102 | bundy@smwlaw.com |
| Public | Igot Vorobyoff | 35 Silver Meadow Lane<br>June Lake, CA 93529 | igorthefifth@gmail.com |
| Public | Joe Crawford | 94 Bay Street<br>June Lake, CA 93529 | joecrawford815@gmail.com |
| Public | Sarah Crawford | 94 Bay Drive<br>June Lake, CA 93529 | sarahholston1216@gmail.com |

| Organization | Name/Title | Mailing Address | Email Address |
|---|---|---|---|
| Public | Joyce Kaufman, Bob Marks | 660 Piute Drive<br>June Lake, CA 93529 | jkaufman@whittier.edu |
| Public | Judy Erb | | dnjerb@gmail.com |
| Public | Karen Gardner | 56 Nevada Street<br>June Lake, CA 93529 | bkakn1@gmail.com |
| Public | Peter Strickells | 210 Zach Ranch Road<br>Bishop, CA 93514 | pstickells@gmail.com |
| Public | Philip Anaya | 2348 Longview Drive<br>Bishop, CA 93514 | Philipana@aol.com |
| Public | Sue Burak | 1335 Rocking W Drive PMB 130<br>Bishop, CA 93514 | sb@snowhydrology.com |
| Public | Kevin Larsen | P.O. Box 426 100 Bruce St<br>June Lake, CA 93529 | kevintlarsen@gmail.com |
| Public | Robert Nailon | 2454 Grimes Cemetery Rd<br>Lufkin, TX 75901 | Robert_Nailon@aol.com |
| Public | Phil Sutphin | | |
| Public | Jeff Yanez | | jeffrobyn22@gmail.com |
| Public | Andrew Zdon | | azdon@rouxinc.com |
| Public | Justin Dohnel | | frontierpacktrain@gmail.com |
| Public | Paul McFarland | | pmcfarland395@gmail.com |
| Public | Terry Plum | | |
| Public | Jora Fogg | | jora.rehm.lorber@gmail.com |
| Public | Robert Marks, Professor Emeritus | 660 Piute Dr.<br>P.O. Box 671<br>June Lake, CA 93529 | rmarks1949@iCloud.com |
| Public | Ed Escoto | | edbuilt@gmail.com |
| Public | Greg James, Attorney | 1839 Shoshone Drive<br>Bishop, CA 93514 | gregjames@earthlink.net |
| Public | Michael P. Cohen | P.O. Box 314<br>June Lake, CA 93529 | mpcohen0713@gmail.com |

| Organization | Name/Title | Mailing Address | Email Address |
|---|---|---|---|
| Roux Associates, Inc. | Rachel Maxwell | | ramaxwell@rouxinc.com |
| **Southern California Edison Company** | | | |
| Southern California Edison Company | FERC Case Administration | 2244 Walnut Grove Avenue<br>Rosemead, CA 91770 | ferccaseadmin@sce.com |
| Southern California Edison Company | Cornelio Artienda | 1515 Walnut Grove Avenue<br>Rosemead, CA 91770 | Cornelio.Artienda@sce.com |
| Southern California Edison Company | Kelly Henderson | 2244 Walnut Grove Avenue<br>Rosemead, CA 91770 | kelly.henderson@sce.com |
| Southern California Edison Company | Jessica Rankin | 2244 Walnut Grove Avenue<br>Rosemead, CA 91770 | jessica.rankin@sce.com |
| Southern California Edison Company | Martin Ostendorf | P.O. Box 100<br>Big Creek, CA 93605-0101 | martin.ostendorf@sce.com |
| Southern California Edison Company | Mary Richardson | 25 S Oak Knoll Avenue, Apt. 209<br>Pasadena, CA 91101 | mary.m.richardson@sce.com |
| Southern California Edison Company | Mary Schickling | 1 Pebbly Beach Road<br>Avalon, CA 90704 | mary.schickling@sce.com |
| Southern California Edison Company | Nicolas von Gersdorff | 1515 Walnut Grove Avenue<br>Rosemead, CA 91770 | nicolas.von@sce.com |
| Southern California Edison Company | Patrick Le | 1515 Walnut Grove Avenue<br>Rosemead, CA 91770 | patrick.le@sce.com |
| Southern California Edison Company | Wayne Allen | 1515 Walnut Grove Avenue<br>Rosemead, CA 91770 | wayne.allen@sce.com |
| Southern California Edison Company | Matthew Woodhall | 1515 Walnut Grove Avenue<br>Rosemead, CA 91770 | Matthew.Woodhall@sce.com |
| Southern California Edison Company | Calvin Rossi | | calvin.rossi@sce.com |
| Southern California Edison Company | Seth Carr | | seth.carr@sce.com |
| Southern California Edison Company | Lyle Laven | | lyle.laven@sce.com |
| Southern California Edison Company | Audry Williams | | audry.williams@sce.com |
| Southern California Edison Company | Matthew C Paruolo | | matthew.paruolo@sce.com |
| Southern California Edison Company | Brittany Arnold | P.O. Box 527<br>Avalon, CA 90704 | brittany.arnold@sce.com |

| Organization | Name/Title | Mailing Address | Email Address |
|---|---|---|---|
| Southern California Edison Company | David Moore | | david.moore@sce.com |
| Southern California Edison Company | Daniel Keverline | | Daniel.Keverline@sce.com |
| Troutman Pepper (outside counsel) | Charles Sensiba (Chuck) | | charles.sensiba@troutman.com |
| Troutman Pepper (outside counsel) | Elizabeth McCormick | | elizabeth.mccormick@troutman.com |

## Table 13-2. Resource Agency and Stakeholder Meeting Dates and Topics

| Date | Type / Purpose | General Attendance | Relicensing Process Overview | Project Description Overview | Stakeholder Interest Statements | Project Schedule | Project Facilities and Operations | Relicensing Process Plan / Communication Protocols | Existing Resource Information | Technical Study Plan Development | Technical Study Implementation Progress |
|---|---|---|---|---|---|---|---|---|---|---|---|
| April 30, 2021 | Focused Agency Meeting | Forest Service | X | X | | X | | | | | |
| July 30, 2021 | Focused Agency Meeting | State Water Board | X | X | | X | | | | | |
| October 19, 2021 | Relicensing Kick-off Webinars | Stakeholders | | X | | | | X | | | |
| March 14, 2022 | FERC Scoping Meeting | Stakeholders | | | X | | | | | | |
| March 14, 2022 | FERC Scoping Meeting | Stakeholders | | | X | | | | | | |
| June 16, 2022 | Proposed Study Plan Meeting | Stakeholders | X | | X | X | | | X | X | |
| November 9, 2023 | Initial Study Report Meeting | Stakeholders | X | | X | X | | X | X | X | X |
| February 13, 2024 | Relicensing Community Meeting | Stakeholders | X | X | | X | X | X | | X | X |
| March 29, 2022 | Focused Agency Meeting | Forest Service | | | | | | | | | X |
| April 19, 2022 | Focused Agency Meeting | CDFW and USFWS | | | | | | | | | X |
| May 29, 2024 | Focused Agency Meeting | USFWS | | X | | | X | | | | X |

## Table 13-3. Technical Working Group Meetings to Develop Technical Study Plans

<table>
<tr><th rowspan="2">Technical Study Plan</th><th colspan="10">Week Starting</th></tr>
<tr><th>31-Jan</th><th>7-Feb</th><th>14-Feb</th><th>21-Feb</th><th>28-Feb</th><th>7-Mar</th><th>14-Mar</th><th>21-Mar</th><th>28-Mar</th><th>4-Apr</th></tr>
<tr><td colspan="11">Aquatic Resources</td></tr>
<tr><td>AQ 1 – Instream Flow / AQ 5 – Geomorphology</td><td></td><td>Feb 8<br>1-4 pm</td><td></td><td></td><td>Mar 1<br>1-4 pm</td><td></td><td></td><td>Mar 24<br>1-4 pm</td><td></td><td></td></tr>
<tr><td>AQ 2 – Hydrology</td><td>Feb 1<br>1-4 pm</td><td></td><td></td><td>Feb 22<br>9 am-12 pm</td><td></td><td></td><td>Mar 15<br>1-4 pm</td><td></td><td></td><td></td></tr>
<tr><td>AQ 3 – Water Temperature</td><td rowspan="2">Feb 3<br>9 am-12 pm</td><td></td><td></td><td rowspan="2">Feb 23<br>9 am-12 pm</td><td></td><td></td><td rowspan="2">Mar 16<br>9 am-12 pm</td><td></td><td></td><td></td></tr>
<tr><td>AQ 4 – Water Quality</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>AQ 6 – Fish Population and Barriers</td><td></td><td></td><td rowspan="2">Feb 15<br>1-4 pm</td><td></td><td></td><td rowspan="2">Mar 8<br>1-4 pm</td><td></td><td></td><td rowspan="2">Mar 29<br>1-4 pm</td><td></td></tr>
<tr><td>AQ 7 – Special-status Amphibians</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td colspan="11">Cultural and Tribal Resources</td></tr>
<tr><td>CUL 1 – Built Environment</td><td></td><td rowspan="3">Feb 9<br>9 am-12 pm</td><td></td><td></td><td rowspan="3">Feb 28<br>9 am-12 pm</td><td></td><td></td><td rowspan="3">Mar 22<br>9 am-12 pm</td><td></td><td></td></tr>
<tr><td>CUL 2 – Archaeology</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>TRI 1 – Tribal</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td colspan="11">Land Resources</td></tr>
<tr><td>LAND 1 – Aesthetics</td><td></td><td></td><td></td><td rowspan="2">Feb 24<br>1-4 pm</td><td></td><td></td><td rowspan="2">Mar 17<br>9 am-12 pm</td><td></td><td></td><td rowspan="2">Apr 5<br>1-4 pm</td></tr>
<tr><td>LAND 2 – Noise</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td colspan="11">Recreation Resources</td></tr>
<tr><td>REC 1 – Recreation</td><td></td><td></td><td>Feb 17<br>9 am-12 pm</td><td></td><td></td><td>Mar 10<br>1-4 pm</td><td></td><td></td><td>Mar 31<br>9 am-12 pm</td><td></td></tr>
<tr><td colspan="11">Terrestrial Resources</td></tr>
<tr><td>TERR 1 – Botanical</td><td></td><td rowspan="2">Feb 10<br>1-4 pm</td><td></td><td></td><td rowspan="2">Mar 3<br>9 am-12 pm</td><td></td><td></td><td rowspan="2">Mar 23<br>9 am-12 pm</td><td></td><td></td></tr>
<tr><td>TERR 2 – Wildlife</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
</table>

## Table 13-4. Technical Working Group Meetings to Review Study Results[1]

| Date | General Topics of Discussion / Objectives |
|---|---|
| **Aquatic Resources TWG** | |
| March 27, 2024 | • Review, with stakeholders, the methodology and findings of the AQ 6 and AQ 7 TSRs |
| April 17, 2024 | • Review, with stakeholders, the methodology and findings of the AQ 3 and AQ 4 TSRs |
| May 2, 2024 | • Review, with stakeholders, the methodology and findings of the AQ 5 (Part A) TSR |
| May 21, 2024 | • Review, with stakeholders, the methodology and findings of the AQ 1 (Part 1) and AQ 2 TSRs |
| **Land Resources TWG** | |
| April 24, 2024 | • Review, with stakeholders, the methodology and findings of the LAND 1 and LAND 2 TSRs |
| **Recreation Resources TWG** | |
| March 25, 2024 | • Review, with stakeholders, the methodology and findings of the REC 1 TSR |
| **Terrestrial Resources TWG** | |
| April 22, 2024 | • Review, with stakeholders, the methodology and findings of the TERR 1 and TERR 2 TSRs |
| **Environmental Justice Study TWG** | |
| June 14, 2024 | • Review the EJ 1 TSR with Mono Lake Kutzadikaᵃ (Kootzaduka'a) Tribe representatives |
| **Full Decommissioning Study TWG** | |
| April 30, 2024 | • Review, with stakeholders, the methodology and findings of Phase I of the Full Decommissioning Study (in person meeting at the June Lake Community Center) |

Note:

[1] Technical Working Group (TWG) meetings identified are those that followed publication of the Technical Study Reports (TSR). TWG meetings held during preparation of the Technical Study Plans are provided in Table 13-3. All meetings were virtual unless otherwise indicated.

Key:

TSR = Technical Study Report

TWG = Technical Working Group

## Table 13-5. Technical Study Report Distribution Dates

| Technical Study Report[1] | TSR Distribution Date |
|---|---|
| **Aquatic Resources** | |
| AQ 1 – Instream Flow[2] | Part 1: April 24, 2024<br>Part 2: September 2024 (DLA)<br>Part 3 January 2025 (FLA) |
| AQ 2 – Hydrology | April 26, 2024 |
| AQ 3 – Water Temperature | March 26, 2024 |
| AQ 4 – Water Quality[3] | March 4, 2024 |
| AQ 5 – Geomorphology[2] | Part A: April 9, 2024<br>Part B: September 2024 (DLA)<br>Part C: January 2025 (FLA) |
| AQ 6 – Special-status Amphibians[3] | February 29, 2024 |
| AQ 7 – Fish Population and Barriers[3] | February 29, 2024 |
| **Cultural Resources** | |
| CUL 1 – Built Environment | January 2025 (FLA) |
| CUL 2 – Archeology | January 2025 (FLA) |
| TRI 1 – Tribal | January 2025 (FLA) |
| **Land Resources** | |
| LAND 1 – Aesthetics[2] | April 1, 2024 |
| LAND 2 – Noise[2] | March 11, 2024 |
| **Recreation Resources** | |
| REC 1 – Recreation | February 29, 2024 |
| **Terrestrial Resources** | |
| TERR 1 – Botanical | March 29, 2024 |
| TERR 2 – Wildlife[2] | March 4, 2024 |
| EJ 1 – Environmental Justice | March 11, 2024 |
| DEC 1 – Full Decommissioning[2] | Phase 1: April 1, 2024<br>Phase 2: January 2025 (FLA) |

Notes:

1 Comments may be filed on the Draft Technical Study Reports included in the Draft License Application. Comments will be addressed, as applicable, in the Final Technical Study Reports to be filed as part of the Final License Application.

2 Due to environmental conditions, not all study elements were able to be completed during the 2023 field season. As a result, outstanding study elements are being completed in the 2024 field season. Data collected during the 2024 field season will supplement the existing Draft TSR and be included in the TSR filed with the FLA. Studies for which outstanding data is being collected during the 2024 field season are: AQ 1 – Instream Flow, AQ 5 – Geomorphology, LAND 1 – Aesthetics, LAND 2 – Noise, TERR 2 – Wildlife, and DEC 1 – Full Decommissioning.

3 Based on stakeholder comments received on the Initial Study Report Meeting Summary (SCE filed the Initial Study Report Meeting Summary with FERC on November 21, 2023) and FERC's subsequent issuance of a determination on requests for study modifications (filed February 23, 2024), all, or portions of the field data collected in 2023 is being collected again in the 2024 field season. This second-year of data will supplement the AQ 4 – Water Quality, AQ 6 – Fish Population and Barriers, and AQ 7 – Special-status Amphibians TSRs.

Key:

DLA = Draft License Application

FLA = Final License Application