SOUTHERN CALIFORNIA EDISON

Lee Vining Hydroelectric Project

(FERC PROJECT NO. 1388)

DRAFT LICENSE APPLICATION
VOLUME I

SOUTHERN CALIFORNIA EDISON®

Energy for What's Ahead℠

September 2024

SOUTHERN CALIFORNIA EDISON

Lee Vining Hydroelectric Project
(FERC Project No. 1388)

Draft License Application
Volume I

Southern California Edison
2244 Walnut Grove Avenue
Rosemead, CA 91770

September 2024

Support from:

Kleinschmidt

List of Exhibits

Initial Statement

Exhibit A	Description of the Project
Exhibit B	Statement of Operation and Resource Utilization
Exhibit C	Construction History
Exhibit D	Project Costs and Financing
Exhibit E	Environmental Report
Exhibit G	Project Maps
Exhibit H	Description of Project Management and Need for Project Power

BEFORE THE
UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Lee Vining Hydroelectric Project
FERC Project No.1388

Application For New License For Major Project—Existing Dam

INITIAL STATEMENT

Title 18 of the Code of Federal Regulations (CFR), Section 4.51 (License for Major Project—Existing Dam) includes a description of information that an applicant must include in the initial statement of its license application.

(1) (Name of applicant) applies to the Federal Energy Regulatory Commission for a (license or new license, as appropriate) for the (name of project) water power project, as described in the attached exhibits. (Specify any previous FERC project number designation.)

(2) The location of the project is:
*State or territory:*__________
*County:*__________
*Township or nearby town:*__________
*Stream or other body of water:*__________

*(3) The exact name and business address of the applicant are:*__________
____
*The exact name and business address of each person authorized to act as agent for the applicant in this application are:*__________
____

(4) The applicant is a [citizen of the United States, association of citizens of the United States, domestic corporation, municipality, or state, as appropriate] and (is/is not) claiming preference under section 7(a) of the Federal Power Act. See 16 U.S.C. 796.

(5)
(i) The statutory or regulatory requirements of the state(s) in which the project would be located that affect the project as proposed, with respect to bed and banks and to the appropriation, diversion, and use of water for power purposes, and with respect to the right to engage in the business of developing, transmitting, and distributing power and in any other business necessary to accomplish the purposes of the license under the Federal Power Act, are: [provide citation and brief identification of the nature of each requirement; if the applicant is a municipality, the applicant must submit copies of applicable state or local laws or a municipal charter, or, if such laws or documents are not clear, other appropriate legal authority, evidencing that the municipality is competent under such laws to engage in the business of developing, transmitting, utilizing, or distributing power.]
(ii) The steps which the applicant has taken or plans to take to comply with each of the laws cited above are: (provide brief description for each law).

(6) The applicant must provide the name and address of the owner of any existing project facilities. If the dam is federally owned or operated, provide the name of the agency.

1. Southern California Edison (SCE or applicant) applies to the Federal Energy Regulatory Commission (FERC) for a new license for the Lee Vining Hydroelectric Project (Project), as described in the attached exhibits. The Lee Vining Hydroelectric Project is licensed to SCE as FERC Project No. 1388, by Order dated February 4, 1997 (78 FERC ¶ 61,110).

2. The location of the Project is:

State:	California
County:	Mono
Nearby township or nearby towns:	Lee Vining, CA
Stream or other body of water:	Lee Vining Creek, Glacier Creek

3. The exact name, business address, and telephone number of the applicant is:

   Southern California Edison Company
   2244 Walnut Grove Avenue
   Rosemead, CA 91770
   Telephone: (626) 302-9596

   The exact name and business address of each person authorized to act as agent for the applicant in this application are:

   Wayne Allen
   Principal Manager
   Regulatory Support Services
   Southern California Edison Company
   2244 Walnut Grove Ave
   Rosemead, CA 91770
   Phone: (626) 302-9741
   E-mail: wayne.allen@sce.com

   Matthew Woodhall
   Relicensing Project Manager
   Southern California Edison Company
   2244 Walnut Grove Avenue
   Rosemead, CA 91770
   Phone: (626) 302-9596
   E-mail: matthew.woodhall@sce.com

   Kelly Henderson
   Senior Attorney
   Southern California Edison Company
   2244 Walnut Grove Avenue
   Rosemead, CA 91770
   Phone: (626) 302-4411
   E-mail: kelly.henderson@sce.com

4. SCE is a public utility corporation incorporated in the State of California and does business in central, coastal, and southern California. SCE is not claiming municipal preference under Section 7(a) of the Federal Power Act (FPA), 16 USC § 800. SCE is claiming preference as the incumbent Licensee under Section 15(a)(2) of the FPA, 16 USC 808(a)(2).

5. (i) The statutory or regulatory requirements of the State of California, the state in which the Lee Vining Hydroelectric Project is located, which would, assuming jurisdiction and applicability, affect the Lee Vining Hydroelectric Project with respect to bed and banks, and to the appropriation, diversion, and use of water for power purposes, and with respect to the right to engage in the business of developing, transmitting, and distributing power, and in any other business necessary to accomplish the purposes of the license under the FPA are:

    A. California Water Code §102 allows for appropriation and use of water for power purposes.
    B. California Water Code §13160 regulates the federally required filing of applications for water quality certification with the State Water Resources Control Board, pursuant to Section 401 of the federal Clean Water Act, 33 USC 1341.
    C. Public Utilities Code §201, et seq. regulates the right of the public utility to produce, generate, transmit, or furnish power to the public.
    D. Public Resource Code §3000, et seq. regulates activities that may affect the coastal zone pursuant to the federal Coastal Zone Management Act, 16 USC 1451.

    (ii) The steps the applicant has taken, or plans to take, to comply with each of the laws cited above are:

    A. California Water Code §102—The applicant has the water rights necessary to operate the Project.
    B. California Water Code §13160—In compliance with FERC's regulations at 18 CFR 5.23(b), the Applicant 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 Ready for Environmental Analysis (REA).
    C. Public Utilities Code §201, et seq.—The California Public Utilities Commission has authorized SCE to produce, generate, transmit, or furnish power to the public.
    D. Public Resource Code §3000, et seq.—On May 11, 2022, the applicant received a Negative Determination from the California Coastal Commission, concurring that the Proposed Action will not affect the coastal zone and, therefore, does not require a consistency determination.

6. SCE is the owner and existing Licensee of the Project. There are no federal facilities associated with the Lee Vining Hydroelectric Project.

ADDITIONAL GENERAL INFORMATION PURSUANT TO *18 CFR § 4.32*

GENERAL INFORMATION

7. SCE has obtained and will maintain any proprietary rights necessary to construct, operate, and maintain the Lee Vining Hydroelectric Project (Project) (FERC Project No. 1388).

8. Identify (providing names and addresses):

(i) Every county in which any part of the Lee Vining Hydroelectric Project and any federal facilities that would be used by the Lee Vining Hydroelectric Project are located in Mono County and encompasses U.S. Forest Service lands. Their addresses are as follows:

Mono County
1290 Tavern Road
Mammoth Lakes, CA 93546

Inyo National Forest
351 Pacu Ln #200
Bishop, CA 93514

(ii) Every city, town, or similar political subdivision:

(a) The name and mailing address of every city, town, or similar local political subdivision in which any part of the Lee Vining Hydroelectric Project and any federal facilities that would be used by the Lee Vining Hydroelectric Project are located. The Lee Vining Hydroelectric Project is not located within any city or town. However, the Project boundary is within the following similar political subdivision:

County Supervisor – District 3
P.O. Box 564
June Lake, CA 93541

There are no federal facilities used by the Lee Vining Hydroelectric Project.

(b) The name and mailing address of every city, town, or similar local political subdivision that has a population of 5,000 or more people and is located within 15 miles of the Project dam:

Unincorporated Community of Lee Vining
Mono County
1290 Tavern Road
Mammoth Lakes, CA 93546

(iii) The name and mailing address of each irrigation district, drainage district, or similar special purpose political subdivisions in which any part of the Lee Vining Hydroelectric Project is located:

There are no irrigation districts, drainage districts, or similar special purpose political subdivisions in which any part of the Lee Vining Hydroelectric Project is located.

(iv) The applicant has reason to believe the following other political subdivisions in the general area of the Lee Vining Hydroelectric Project would likely be interested in or affected by the application.

Mono County, Department of Public Works (Engineering, Facilities, and Roads)
74 North School Street
P.O. Box 457
Bridgeport, CA 93517

Mono County, Division of Drinking Water
1290 Tavern Road
P.O. Box 3329
Mammoth Lakes, CA 93546

Los Angeles Department of Water and Power
300 Mandich Street
Bishop, CA 93514

Lee Vining Public Utility District
Highway 120
P.O. Box 266
Lee Vining, CA 93541

Inyo-Mono Resource Conservation District
270 North See Vee Lane #6
Bishop, CA 93514-9624

County Supervisor-District 3
Bob Gardner
P.O. Box 564
June Lake, CA 93541

Tri-Valley Groundwater Management District
123B Valley Road
Bishop, CA 93514

Lahontan Regional Water Quality Control Board, South Lake Tahoe Office
2501 Lake Tahoe Blvd
So. Lake Tahoe, CA 96150

(v) The name and mailing addresses of each federally recognized Native American Tribe potentially affected by the Lee Vining Hydroelectric Project:

American Indian Council of Mariposa County
P.O. Box 186
Mariposa, CA 95338

Antelope Valley Indian Community, Coville Paiute Tribe
P.O. Box 47
Coleville, CA 96107

Big Pine Paiute Tribe of Owens Valley
P.O. Box 700
Big Pine, CA 93513

Bishop Paiute Tribe
50 Tu Su Lane
Bishop, CA 93514

Bridgeport Paiute Indian Colony
P.O. Box 37
Bridgeport, CA 93517

Fort Independence Indian Community of Paiute Indians
P.O. Box 67
Independence, CA 93526

Lone Pine Paiute-Shoshone Tribe
P.O. Box 747
Lone Pine, CA 93545

Mono Lake Kutzadika[a] Tribe
P.O. Box 117
Big Pine, CA 93513

North Fork Mono Tribe of California
13396 Tollhouse Road
Clovis, CA 93619

North Fork Rancheria of Mono Indians
P.O. Box 929
North Fork, CA 93643

Timbisha Shoshone Tribe
621 W Line St., Suite 109
Bishop, CA 93514

Tuolumne Band of Me-Wuk Indians of the Tuolumne Rancheria of California
P.O. Box 669
Tuolumne, CA 95379

Utu Gwaitu Paiute Tribe of the Benton Paiute Reservation
25669 Highway 6
Benton, CA 93512

Walker River Paiute Tribe
P.O. Box 220
Schurz, NV 89427

Washoe Tribe of Nevada and California
919 U.S. Highway 395 N
Gardnerville, NV 89410

Yerington Paiute Tribe of the Yerington Colony and Campbell Ranch
171 Campbell Lane
Yerington, NV 89447

Yosemite-Mono Lake Paiute Indian Community
P.O. Box 157
Lee Vining, CA 93541

9. Pursuant to 18 CFR § 4.32(a)(3)(i), the applicant has made a good faith effort to give notification by certified mail of the filing of the application to:

    A. Every property owner of record of any interest in the property within the bounds of the Project or, in the case of the Project without a specific boundary, each such owner of property that would underlie or be adjacent to any Project works, including any impoundments; and
    B. The entities identified in paragraph (2) above, as well as any other federal, state, municipal, or other local government agencies that there is reason to believe would likely be interested in or affected by the application.

10. In accordance with 18 CFR § 4.51, the following exhibits are attached to and made part of this application:

    Exhibit A, Description of the Project
    Exhibit B, Statement of Operation and Resource Utilization
    Exhibit C, Construction History
    Exhibit D, Projects Costs and Financing
    Exhibit E, Environmental Report
    Exhibit F, General Design Drawings and Supportive Information (CEII)
    Exhibit G, Project Maps
    Exhibit H, Description of Project Management and Need for Project Power

SUBSCRIPTION

[To be executed for Final License Application]

This Application for New License for the Lee Vining Hydroelectric Project, FERC Project No. 1388, is executed in the State of California, County of Mono, by Wayne P. Allen of Southern California Edison Company, 2244 Walnut Grove Avenue, Rosemead, California, 91770, who, being duly sworn, deposes and says that the contents of this application are true to the best of their knowledge or belief and that they are authorized to execute this application on behalf of SCE. The undersigned has signed this application on this ____ day of ___________, 2024.

SOUTHERN CALIFORNIA EDISON COMPANY

By: ____________________________________

Wayne Allen
Principal Manager
Regulatory Support Services
Southern California Edison Company

VERIFICATION

SUBSCRIBED AND SWORN TO before me, a Notary Public in and for the State of California this _____ of __________ 2024.

____
Notary Public, residing at

____

My commission expires:

____

SEAL

SOUTHERN CALIFORNIA EDISON

LEE VINING HYDROELECTRIC PROJECT

(FERC PROJECT NO. 1388)

EXHIBIT A

DRAFT LICENSE APPLICATION

SOUTHERN CALIFORNIA EDISON

Energy for What's Ahead℠

September 2024

SOUTHERN CALIFORNIA EDISON

Lee Vining Hydroelectric Project
(FERC Project No. 1388)

Draft License Application
EXHIBIT A: Description of the Project

Southern California Edison
2244 Walnut Grove Avenue
Rosemead, CA 91770

September 2024

Support from:

Kleinschmidt

Exhibit A: Description of the Project

Title 18 of the Code of Federal Regulations, Section 4.51 (License for Major Project—Existing Dam) includes a description of information that an applicant must include in Exhibit D of its license application.

Exhibit A is a description of the project. This exhibit need not include information on project works maintained and operated by the United States Army Corps of Engineers, the Bureau of Reclamation, or any other department or agency of the United States, except for any project works that are proposed to be altered or modified. If the project includes more than one dam with associated facilities, each dam and the associated component parts must be described together as a discrete development. The description for each development must contain:

(1) The physical composition, dimensions, and general configuration of any dams, spillways, penstocks, powerhouses, tailraces, or other structures, whether existing or proposed, to be included as part of the project;

(2) The normal maximum surface area and normal maximum surface elevation (mean sea level), gross storage capacity and usable storage capacity of any impoundments to be included as part of the project;

(3) The number, type, and rated capacity of any turbines or generators, whether existing or proposed, to be included as part of the project;

(4) The number, length, voltage, and interconnections of any primary transmission lines, whether existing or proposed, to be included as part of the project [see 16 U.S.C. 796(11)];

(5) The specifications of any additional mechanical, electrical, and transmission equipment appurtenant to the project; and

(6) All lands of the United States that are enclosed within the project boundary described under each paragraph (h) of this section (Exhibit G), identified and tabulated by legal subdivisions of a public land survey of the affected area or, in the absence of a public land survey, by the best available legal description. The tabulation must show the total acreage of the lands of the United States within the project boundary.

Southern California Edison (SCE) is the Licensee, owner, and operator of the Lee Vining Hydroelectric Project (Project), licensed under the Federal Energy Regulatory Commission (FERC) Project Number 1388. SCE currently operates the Project under a 30-year license issued by FERC on February 4, 1997. The license will expire January 31, 2027. SCE is seeking a license renewal to continue operation and maintenance of the Project.

The Project is located on Lee Vining and Glacier Creeks on the eastern slope of the Sierra Nevada along the eastern boundary of Yosemite National Park, and approximately 9 miles upstream from Mono Lake and the town of Lee Vining in Mono County, California (Figure A-1). A more detailed map set of the Project is included in Exhibit G, *Project Maps*. The 11.25-megawatt (MW) Project consists of three dams and reservoirs, an auxiliary dam, a flowline consisting of a pipeline and penstock, and a powerhouse. The Project is located predominantly on federal lands administered by the Inyo National Forest, with a small portion of lands owned by SCE.

This Exhibit A describes existing Project facilities (from upstream to downstream) including dams and lakes; water conveyance systems; the powerhouse; gages; power and communication lines; and appurtenant facilities. A list of current Project facilities is provided in Table A-1.

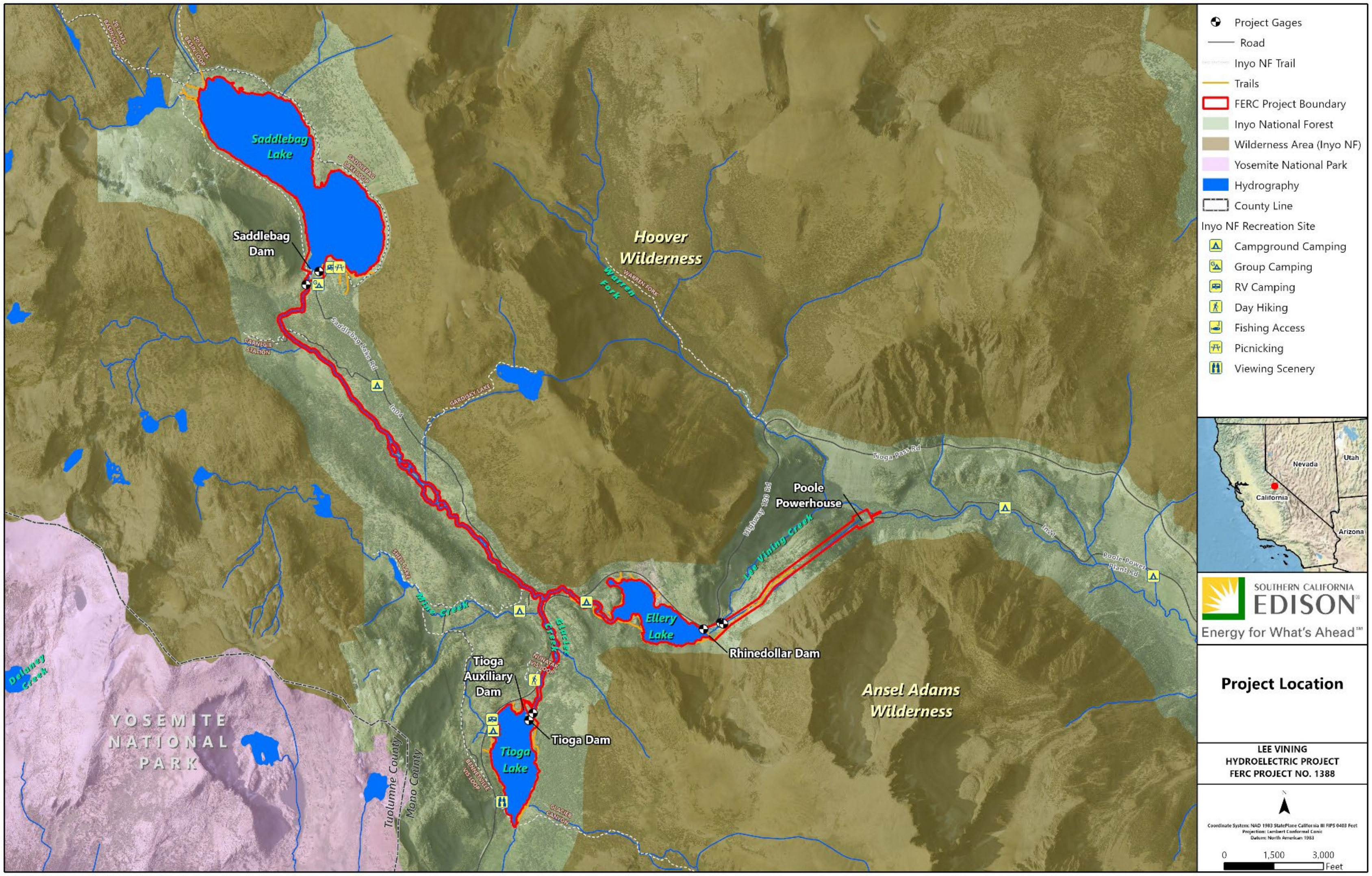

Figure A-1 Project Facilities Locations.

(1) Project Facilities

A list of Project facilities used for hydroelectric generation at the Project is included in Table A-1. Facilities are described in detail in the sections that follow.

Table A-1 List of Facilities Used for Hydroelectric Generation

General Location	Facility/Structure
Saddlebag Lake	Saddlebag Lake
	Saddlebag Dam and spillway
	Saddlebag valve house
	Saddlebag gate valve and steel pipe
	Access roads at Saddlebag Dam
Tioga Lake	Tioga Lake
	Tioga Dam and spillway
	Tioga Auxiliary Dam
	Tioga valve house
	Tioga gate valve, steel pipe, trashracks
	Access road at Tioga Dam and Auxiliary Dam
Ellery Lake / Rhinedollar Dam	Ellery Lake
	Rhinedollar Dam and spillway with radial gates
	Rhinedollar valve house
	Tunnel intake with trashracks
	Rhinedollar gate valve, Pelton butterfly valve, trashracks
Powerhouse	Poole Powerhouse
	Turbine
	Motor-operated gate valve and bypass
	Tailrace
	Switchyard
	Historic housing apartment complex
	Equipment garage
	Shop/storage garage

General Location	Facility/Structure
Other Project Works	Flowline (pipeline and penstock)
	Seven SCE/USGS Gaging stations
	Non-Project Transmission Facilities—None, transmission line was removed from license in 2001
	Fiber-optic line to Poole Powerhouse for remote operation

SCE = Southern California Edison; USGS = U.S. Geological Survey

As required by Federal Power Act (FPA) regulations Code of Federal Regulations, Title 18, Section 4.51(b)(1) (18 CFR § 4.51(b)(1)), the following section describes the physical composition, dimensions, and general configuration of any dams, spillways, penstocks, powerhouses, tailraces, or other structures, whether existing or proposed, to be included as part of the Project.

The Project includes four dams: Saddlebag Dam, Tioga Dam, Tioga Auxiliary Dam, and Rhinedollar Dam. A flowline, consisting of a pipeline and penstock, conveys water from Ellery Lake to Poole Powerhouse.

Minimum flow requirements are different below each dam (U.S. Forest Service [USFS] Condition No. 4 of current license, 78 FERC ¶ 61,110). Under the current license, minimum flow requirements are based on whether the water year is wet, normal, or dry, as well as the water inflow into each reservoir. A water year is considered “wet” when the annual precipitation was in the highest 30 percent of the previous years, back to 1966. A water year is “dry” when the precipitation is in the lowest 30 percent of the previous years, back to 1966. A “normal” water year is when it is neither wet nor dry. Under any new license, the methodology for determining a wet, normal, and/or dry year will be reviewed and modified as necessary.

Saddlebag Dam

Saddlebag Dam is located on Saddlebag Lake in the headwaters of Lee Vining Creek. The dam is 45 feet high and 600 feet long, geomembrane-lined, redwood-faced, and composed of rockfill (SCE, 2020a). The dam impounds the 297-acre Saddlebag Lake.

Below Saddlebag Dam, the minimum instream flow requirements are determined annually in consultation with USFS, no later than May 1 of each calendar year. If SCE and USFS do not agree on flows, the following minimums apply year-round:

- 14 cubic feet per second (cfs) for wet years
- 9 cfs for normal years
- 6 cfs for dry years

Spillways

The spillway is centrally located on the dam; it is an ungated, concrete-lined rectangular notch that is integral with the center section of the dam. The spillway is 54 feet wide and 5 feet deep, with a current crest elevation of 10,089.4 feet (SCE, 2020a). The zero-freeboard spillway discharge capacity is 1,436.5 cfs (SCE, 2020a).

The spillway chute was originally completely sheathed with redwood planking and had a short concrete apron at its downstream end, with a cutoff into bedrock. In 2013, the spillway redwood planking was removed and replaced with reinforced concrete. The concrete apron was extended to approximately 25 feet, and the spillway crest elevation was lowered by one foot to elevation 10,089.4 feet; prior to 2013, the spillway crest elevation was 10,090 feet (SCE, 2020a). A pedestrian bridge was installed over the spillway.

The spillway discharges directly into Lee Vining Creek below the dam.

Intakes

Water is released to the downstream channel via the low-level outlets. The intake is a fully submerged, ungated, concrete intake box at the upstream toe of the dam (SCE, 2020a). The intake elevation is 10,048.8 feet (SCE, 1997).

Conveyance Systems

There are no power conveyances at Saddlebag Dam.

There is a 30-inch-diameter riveted steel pipeline to extend the outlet downstream of the dam by about 220 feet. The purpose of this pipeline is to prevent interference with outlet flows by snow and ice in the rockcut for the outlet (SCE, 2020a).

The natural channel of Lee Vining Creek is used to convey stored water in Saddlebag Lake to Ellery Lake.

Low-Level Outlets

The low-level outlet works consist of a fully submerged, ungated, concrete intake box at the upstream toe of the dam, admitting water to a concrete-encased, 30-inch-diameter steel pipe that passes under the dam near the left abutment (SCE, 2020a).

The steel pipe is controlled at the downstream toe by a manually operated 30-inch rising stem gate valve located in a small building. The valve is normally partially open to control discharge so as to avoid spill downstream at Rhinedollar Dam (SCE, 2020a).

The outlet discharges directly into Lee Vining Creek and has a center elevation about 40.3 feet below the normal full reservoir level; the outlet has a maximum discharge of about 150 cfs based on the orifice equation at normal full reservoir level (SCE, 2020a).

Valve House

A concrete valve house is south of Saddlebag Dam. The valve house contains a 30-inch gate valve (SCE, 2020a).

Tioga Dam and Tioga Auxiliary Dam

Tioga Dam and the Tioga Auxiliary Dam are located on Tioga Lake, in the headwaters of Glacier Creek, which then drains into Lee Vining Creek. Tioga Dam is a 27-foot-high, 270-foot-long, redwood-faced, rockfill dam (SCE, 2023). Tioga Auxiliary Dam is a 19-foot-high, 50-foot-long, constant radius concrete-arch dam (only the top 5 feet are visible due to backfill; SCE, 2023). These dams together impound the 73-acre Tioga Lake.

Below Tioga Dam, the flow requirements are different depending on the month, the water year, and the amount of inflow. The reservoir is kept low in the winter in preparation for spring run-off. The minimum instream flow requirements are determined annually in consultation with USFS, no later than May 1 of each calendar year. If SCE and USFS do not agree on flows, the following minimums apply:

May through September:

- In a wet or normal water year, if the inflow is less than 2 cfs, the flow requirement is equal to the inflow and cannot exceed 2 cfs. If the inflow is greater than 2 cfs, the flow requirement is 2 cfs until the lake water surface elevation is within 2 feet of the main spillway crest; once this level has been achieved, the flow changes to greater than 60 percent of the inflow.

- In a dry water year, if the inflow is less than 2 cfs, the flow requirement is equal to the inflow and cannot exceed 2 cfs. If the inflow is greater than 2 cfs, the flow requirement is 2 cfs until the lake water surface elevation is within 2 feet of the main spillway crest; once this level has been achieved, then the flow changes to the natural inflow.

October and November: the minimum flow is 2 cfs or the natural inflow.

December through April: the minimum flow is equal to the natural flow.

Spillways

The main spillway located at the right abutment of Tioga Dam is ungated and consists of an excavated channel into granite bedrock. This channel has a flat concrete sill to control the spill elevation. The spillway is 57-feet-wide and 4-feet-deep, with a crest at an elevation of 9,650.28 feet, which is 1 foot lower than the auxiliary spillway crest on the arch dam (SCE, 2023). It is sited at the southeast end of the dam.

The auxiliary spillway bays located on the auxiliary dam are located between the two end piers and the center pier and have a fixed crest elevation of 9,651.28 feet, which is 1 foot higher than the main spillway located to the right of the timber face rockfill dam (SCE, 2023). The right spillway bay is 19.5-feet-long, and the left bay is 21.5 feet long, measured along the arch radius (SCE, 2023).

The main spillway has an estimated spill capacity of 1,460 cfs, and the auxiliary has an estimated spill capacity of 760 cfs at zero freeboard at the crest of Tioga Dam (9,654.3 feet elevation). The total estimated spill capacity of both spillways is 2,220 cfs at zero freeboard at the dam crest (SCE, 2023).

Intakes

As there are no power generation facilities associated with the dams, there is no intake at Tioga Dam or the auxiliary dam (SCE, 2023).

Conveyance Systems

There are no power conveyances at Tioga Dam. The natural channel of Glacier Creek is used to convey stored water in Tioga Lake to Ellery Lake.

Low-Level Outlets

The low-level outlet works consist of a 24-inch diameter concrete-encased riveted steel pipe that passes through the base of the main Tioga Dam (SCE, 2023). No low-level outlet exists at the auxiliary dam. The invert elevation of the outlet pipe at the upstream side is at 9,626.72 feet (SCE, 2023). The upstream end of the pipe is protected by a 6-foot by 7-foot trashrack.

The steel pipe wall has a thickness of 0.25 inch, which is covered by a minimum thickness of 6 inches of concrete. The outlet pipe is manually controlled by a 24-inch gate valve located in a valve house at the downstream toe of the dam (SCE, 2023).

Valve House

A concrete valve house is north of the main Tioga Dam. The valve house contains a 24-inch gate valve (SCE, 2023).

Rhinedollar Dam

Rhinedollar Dam is located on Ellery Lake, on Lee Vining Creek, downstream of the confluence with Glacier Creek; both Saddlebag and Tioga Lakes drain into Ellery Lake. The Rhinedollar Dam is an 18.5-foot-high (17 feet with a 1.5-foot concrete parapet), 437-foot-long, rockfill dam that impounds the 61-acre Ellery Lake (SCE, 2020b). Releases from the reservoir flows down Lee Vining Creek (via the spillway or side outlet flow) or is diverted via the penstock to the Poole Powerhouse (SCE, 2020b).

Spillways

The spillway is a concrete side-channel excavated in hornfels at the left abutment of the dam. It has three spillway bays, each 12 feet wide and 5 feet deep, with a crest at elevation 9,492.53 feet and together act as a broad crested weir (SCE, 2020b). Three 12-foot-wide and 4-foot-high radial gates were removed in 1998 (SCE, 2020b). The zero-freeboard spillway discharge capacity is 1,820 cfs (SCE, 2020b).

In 2017, SCE completed a project to remove the concrete piers that previously supported the radial gates. Steel beams were added to the footbridge (SCE, 2020b).

Intakes

The Project's reinforced concrete intake structure is located at Rhinedollar Dam. It is protected by a single set of trashracks. Water flows under the dam through a 48-inch steel pipe encased in 8 inches of concrete (SCE, 2020b). The intake elevation is 9,480 feet (SCE, 1997).

Flowline/Penstock/Conveyance System

The Project's 6,271-feet long flowline consists of a pipeline and a penstock; water is conveyed from Ellery Lake to the Poole Powerhouse though the penstock. The pipeline is 2,530 feet long and 48 inches in diameter (SCE, 2020b). It is composed of double riveted lap joint steel pipe. The Project's penstock is 3,741 feet long and 28 to 44 inches in diameter (SCE, 2020b). It is composed of lap welded steel. It has a maximum flow of 110 cfs (SCE, 2020b). The flowline features are below ground in a tunnel extending from Rhinedollar Dam to Poole Powerhouse.

Low-Level Outlets

This outlet is part of the penstock to Poole Powerhouse located below the dam. The outlet works consists of a 48-inch concrete-encased steel pipe conduit, which passes through the base of the dam at elevation 9,478.53 feet to a remote-controlled butterfly valve at the downstream end. The valve can be remotely closed and opened. A 30-inch manually operated gate valve is located adjacent to the butterfly valve and is used as a side outlet to drain the conduit upstream of the butterfly valve. An extension was added to the 30-inch bypass line in 1998 to convey the discharge downstream of the toe of the dam (SCE, 2020b). The intake elevation is 9,480 feet (SCE, 1997). Pipe invert elevation is 9,478.5 feet (SCE, 1997).

Valve house

A concrete valve house is on the flowline to Poole Powerhouse just downstream of Rhinedollar Dam. The valve house contains a 48-inch Pelton butterfly valve and a 30-inch gate valve(SCE, 2020b).

(2) Storage Capacity of Reservoirs

As required by FPA regulations 18 CFR § 4.51(b)(2), the following section provides the normal maximum surface area and normal maximum surface elevation (mean sea level), net storage capacity, and usable storage capacity of any impoundments to be included as part of the Project.

The Project includes three reservoirs: Saddlebag Lake, Tioga Lake, and Ellery Lake. Releases and spill from both Saddlebag Lake and Tioga Lake flow through the natural downstream channels of Lee Vining Creek and Glacier Creek into Ellery Lake, which is the intake and regulating reservoir for Poole Powerhouse. Saddlebag and Tioga Lakes have historically been drawn down in the winter to provide storage capacity for spring run-off. Ellery Lake is the forebay for the powerhouse, and its storage level is not as varied as the two upper reservoirs. Water is conveyed from Ellery Lake to the powerhouse via the pipeline and penstock. Minimum flows are provided into Lee Vining Creek below Poole Powerhouse.

There are no impoundments on Lee Vining or Glacier Creeks upstream of the Project.

Summary of Reservoir Information

Table A-2 includes a summary of reservoir and dam data discussed in the *Project Facilities* section.

Table A-2 Table Reservoir and Dam Details Summary

	Saddlebag Lake and Dam	Tioga Dam and Lake	Tioga Auxiliary Dam	Rhinedollar Dam and Ellery Lake
Spillway Crest Elevation	10,089.4 feet	9,650.3 feet	9,651.3 feet	9,492.53 feet
Spillway Dimensions	54 feet wide, 5 feet deep	57 feet wide, 4 feet deep	Right bay 19.5 feet long; Left bay 21.5 feet long	Three spillway bays, each 12 feet wide, 5 feet deep
Zero-freeboard Spillway Discharge Capacity	1,436.5 cfs	1,460 cfs	760 cfs	1,820 cfs
Intake/Invert Elevation	10,048.8 feet	9,626.72 feet	--	9,478.53 feet

	Saddlebag Lake and Dam	Tioga Dam and Lake	Tioga Auxiliary Dam	Rhinedollar Dam and Ellery Lake
Low-Level Outlet Elevation	Center elevation 40.3 feet below the normal full reservoir level / 10,048.8	9,626.72 feet	--	At base of the dam at elevation 9,478.53 feet
Low-Level Outlet Capacity	a maximum discharge of about 150 cfs	72 cfs	--	110 cfs
Valve Dimensions	30-inch gate valve	24-inch gate valve	--	30-inch gate valve
Low-Level Outlet Dimensions	30-inch-diameter pipe	24-inch diameter pipe	--	48-inch diameter pipe
Dam Dimensions	45 feet high, 600 feet long	27 feet high, 270 feet long	19 feet high, 50 feet long	17 feet high, 437 feet long
Normal Maximum Surface Area	297 acres	73 acres	--	61 acres
Normal Full Pond Elevation	10,089.4 feet above sea level	9,650.28 feet above sea level	--	9,492.53 feet above sea level
Net Storage Capacity	9,765 acre-feet	1,254 acre-feet	--	493 acre-feet

Sources: SCE, 1997, 2018a, 2018b, 2019, 2020a, 2020b, 2023

Saddlebag Lake

Saddlebag Lake is in the headwaters of Lee Vining Creek. It is the lake farthest north of the Project and highest in elevation. The drainage area is approximately 4.5 square miles. Saddlebag Lake is generally drawn down in the winter to allow storage capacity for spring run-off. Saddlebag Lake has a surface area of 297 acres and has a net storage capacity of 9,765 acre-feet (AF) (SCE, 2020a). Saddlebag Lake previously had a storage capacity of 9,789 AF at normal maximum reservoir level (elevation 10,090.4 feet); however, in 2013, the spillway crest elevation was lowered 1 foot to 10,089.4 feet, resulting in the current reservoir net storage capacity of 9,765 AF (SCE, 2020a).

Tioga Lake

Tioga Lake is in the headwaters of Glacier Creek, which then drains into Lee Vining Creek. It is the lake farthest south in the Project Area. The drainage area is approximately 4.03 square miles (SCE, 2018b). Tioga Lake is generally drawn down in the winter to allow storage capacity for spring run-off. Tioga Lake has two dams: the main Tioga Dam and the Tioga Auxiliary Dam. Tioga Lake has a surface area of 73 acres and a net storage capacity is 1,254 AF (SCE, 2023).

Ellery Lake

Ellery Lake is on Lee Vining Creek, downstream of the confluence with Glacier Creek; both Saddlebag and Tioga Lakes drain into Ellery Lake. Ellery Lake is the smallest and farthest east of the three Project lakes. However, the drainage area is the largest at 16.7 square miles (USGS, 2024). Ellery Lake is the forebay for the Poole Powerhouse, and its storage level is not varied as much as either Saddlebag or Tioga Lakes. Ellery Lake has a surface area of 61 acres and a net storage capacity of 493 AF (SCE, 2020b).

(3) Powerhouses, Turbines, and Generators

As required by FPA regulations 18 CFR § 4.51(b)(3), the following section contains the number, type, and rated capacity of any turbines or generators, whether existing or proposed, to be included as part of the Project.

Poole Powerhouse

The Poole Powerhouse is a reinforced concrete building constructed in the 1920s. It is located on Lee Vining Creek east (downstream) of Ellery Lake. The building is 68 feet long, 38 feet wide, 43 feet high, and has a substructure that is 18 feet deep. The powerhouse’s control panel is located on the ground floor. The powerhouse contains a restroom, storage room, battery room, operators desk, and a five-panel switchboard. There is a motor-operated gate valve with bypass and a tailrace outside the powerhouse.

The powerhouse contains one General Electric generating unit with a nameplate capacity of 11.25 MW. The Project has one Pelton single-overhung, horizontal-impulse turbine with a design capacity of 17,910 horsepower and a hydraulic capacity of 105 cfs.

There is a turbine shutoff valve to isolate the unit. The plant is unmanned but is continuously monitored at the Bishop Control Center via the Supervisory Control and Data Acquisition (SCADA) system.

The switchyard is located immediately north of the powerhouse and contains the main power transformers. Galvanized structural steel switchracks support the switchgear, busses, and related equipment. The generator is connected to the transformer bank through a 7-kilovolt, 1,200-amp circuit breaker.

Flow from Poole Powerhouse is discharged to Lee Vining Creek. When the powerhouse is offline, a release valve at Ellery Lake allows the Project to meet minimum flow requirements.

During the regular Project operations as authorized by the existing license, SCE maintains each year a continuous, minimum flow as follows:

August to May: 27 cfs or the natural flow, whichever is less.

June to July: 89 cfs or the natural flow, whichever is less, as measured by a continuously recording gauging device installed in the Poole Powerhouse. During those periods when short-term repair and testing of the Poole Powerhouse facilities may be needed (i.e., Poole Powerhouse is offline), minimum flows in Lee Vining Creek are measured downstream of Ellery Lake, below Rhinedollar Dam.

SCE is authorized under the license to temporarily modify minimum flows if required by operating emergencies beyond its control. SCE may also modify minimum flows for short periods upon written consent of the USFS.

Turbine

The Project has one Pelton single jet, single-overhung, horizontal-impulse turbine with a rated design capacity of 17,910 horsepower, design head 1,550 feet, rated at 1,531 feet, 360 rotations per minute, with a hydraulic capacity of 105 cfs.

Generator

The powerhouse contains one air-cooled General Electric direct-connect type AT1 generating unit with a nameplate capacity of 11.25 MW and dependable capacity of 10.9 MW. The generator is rated at 11,250 kilowatts, 0.9 power factor, 7.5 kilovolts, three-phase, 60 hertz.

(4) <u>Primary Transmission Lines</u>

As required by FPA regulations 18 CFR § 4.51(b)(4), the following section describes the number, length, voltage, and interconnections of any primary transmission lines, whether existing or proposed, to be included as part of the Project.

The primary transmission line runs between the switchyard and Poole Powerhouse, approximately 50 feet. A non-Project 6.4-mile-long transmission line was removed from the Project's license in 2001[1], and runs from the switchyard to the Lee Vining Substation, a non-Project facility.

A single-line diagram showing the transfer of electricity from the Project to the transmission grid is filed as Critical Energy Infrastructure Information (CEII) in Volume IV of this Draft License Application. SCE considers this information CEII and has therefore restricted its availability.

[1] FERC's July 23, 2001, *Order Amending License in Part, Approving Revised Exhibits, and Revising Annual Charges* approved, in part, the deletion of the 6.4-mile-long, 115-kilovolt transmission line, extending from Poole Powerhouse to the Lee Vining Substation, from the Project license, to be effective on the date that SCE received all necessary permits or approvals from the USFS for the continued use of National Forest System Lands. These approvals were obtained in the form of a March 12, 2007, Electric Transmission Line Easement from the USFS authorizing the continued operation of the non-Project transmission line. In compliance with ordering paragraph (E) of FERC's July 23, 2001, order, SCE filed the easement document and revised exhibit drawings with FERC on April 16, 2009. By order dated December 23, 2009, FERC approved the revised Exhibit G drawings, which reflect, in part, the deletion of the transmission line; however, the FERC Project Boundary geographic information system data filed with those drawings errantly did not delete the transmission line. All calculations assume the transmission line is no longer part of the FERC Project Boundary.

(5) Gages and Appurtenant Facilities

As required by FPA regulations 18 CFR § 4.51(b)(5), the following section specifies any additional mechanical, electrical, and transmission equipment appurtenant to the Project.

The Poole Powerhouse facility includes three detached ancillary buildings. One adjacent structure was historically a three-family construction and operators housing apartment complex. Two smaller buildings are a garage for storing equipment and materials and a shop/storage garage that has parts and other materials. A historic Operator's Cabin sits on the northside of Ellery Lake, within the FERC Project Boundary.

Gaging Stations

There are Project-associated stream gages immediately downstream of Saddlebag and Tioga Dams, in stream. These gages continuously collect streamflow data, which is monitored and recorded at the Bishop Control Center.

There are seven stream gages located in the Project Area that are actively recording data. The gages are published by the U.S. Geological Survey (USGS) but are owned by SCE. The seven gages in the Project Area are shown in Table A-3.

Table A-3 SCE Gaging Stations

SCE Gage No.	USGS Gage No.	Location
353	10287770	In stream, Lee Vining Creek below Ellery Lake
354	10287655	In stream, Lee Vining Creek below Saddlebag Lake
356	10287760	In reservoir, Ellery Lake (Rhinedollar Reservoir)
360	10287650	In reservoir, Saddlebag Lake
361	10287700	In reservoir, Tioga Lake
363	10287762	In stream, Poole Plant Use (acoustic velocity meter)
368	10287720	In stream, Glacier Creek below Tioga Lake

SCE = Southern California Edison; USGS = U.S. Geological Survey

Additionally, Los Angeles Department of Water and Power maintains a flume that continually measures instream flows approximately 5 miles downstream of the Poole Powerhouse and upstream of their Lee Vining Creek diversion.

Project Roads

Project operation and maintenance activities use existing gravel access roads at Saddlebag Dam (2.05 acres) and Tioga Dam (0.52 acre). These roads are included in the proposed FERC Project Boundary.

(6) Lands of the United States within Project Boundaries

As required by FPA regulations 18 CFR § 4.51(b)(6), this subsection identifies all lands of the United States that are enclosed within the proposed FERC Project Boundary, identified and tabulated by legal subdivisions of a public land survey of the affected area or, in the absence of a public land survey, by the best available legal description.

Land ownership both within the FERC Project Boundary and within a 0.5-mile buffer of it are composed predominantly of federal lands administered by the Inyo National Forest, with a small portion of lands owned by SCE. Exhibit G, *Project Maps*, of this Draft License Application includes maps that have been updated with the proposed FERC Project Boundary, per modifications made through consultation with Stakeholders and the *Project Lands and Roads (LAND-1) Final Technical Report*, which is included in Volume III of this Draft License Application. As shown in the proposed FERC Project Boundary geographic information system data in Exhibit G, 98.8 percent (535.99 acres) of Project lands are federal lands administered by the USFS and 1.2 percent (6.26 acres) are owned by SCE (Table A-4).

Table A-4 Land Ownership within the Proposed FERC Project Boundary

Ownership	Acreage	Percentage of Total
USFS	535.99	98.8%
SCE	6.26	1.2%
Total Project Acreage	542.25	100%

SCE = Southern California Edison; USFS = U.S. Forest Service

References

SCE (Southern California Edison Company). 1997. Exhibit F Drawings from Lee Vining Project Final License Application.

SCE (Southern California Edison Company). 2018a. *Supporting Technical Information Document, Saddlebag Lake Dam.* FERC Project No. 1388-CA. May 2018. Revised September 26, 2019.

SCE (Southern California Edison Company). 2018b. *Supporting Technical Information Document, Tioga Lake Dams.* FERC Project No. 1388-CA. May 2018.

SCE (Southern California Edison Company). 2019. *Supporting Technical Information Document, Rhinedollar Dam.* FERC Project No. 1388-CA. September 2019.

SCE (Southern California Edison Company). 2020a. *Supporting Technical Information Document, Saddlebag Lake Dam.* FERC Project No. 1388-CA. November 2020.

SCE (Southern California Edison Company). 2020b. *Supporting Technical Information Document, Rhinedollar Dam.* FERC Project No. 1388-CA. November 2020.

SCE (Southern California Edison Company). 2023. S*upporting Technical Information Document, Tioga Lake Dams*. FERC Project No. 1388-CA. June 2023.

USGS (U.S. Geological Survey). 2024. "Water-Year Summary for Site USGS 10287760." National Water Information System [online database]. Accessed: July 2024. Available online: https://nwis.waterdata.usgs.gov/nwis/wys_rpt?dv_ts_ids=213419&wys_water_yr=2023&site_no=10287760&agency_cd=USGS&adr_water_years=2006%2C2007%2C2008%2C2009%2C2010%2C2011%2C2012%2C2013%2C2014%2C2015%2C2016%2C2017%2C2018%2C2019%2C2020%2C2021%2C2022%2C2023&referred_module=.

Southern California Edison

Lee Vining Hydroelectric Project

(FERC Project No. 1388)

Exhibit B

Draft License Application

SOUTHERN CALIFORNIA EDISON®

Energy for What's Ahead℠

September 2024

SOUTHERN CALIFORNIA EDISON

Lee Vining Hydroelectric Project
(FERC Project No. 1388)

Draft License Application
EXHIBIT B: Statement of Operation and Resource Utilization

Southern California Edison
2244 Walnut Grove Avenue
Rosemead, CA 91770

September 2024

Support from:

Kleinschmidt

Exhibit B: Statement of Operation and Resource Utilization

Title 18 of the Code of Federal Regulations, Section 4.51 (License for Major Project—Existing Dam) includes a description of information that an applicant must include in Exhibit B of its license application.

Exhibit B is a statement of project operation and resource utilization. If the project includes more than one dam with associated facilities, the information must be provided separately for each such discrete development. The exhibit must contain:

(1) A statement whether operation of the powerplant will be manual or automatic, an estimate of the annual plant factor, and a statement of how the project will be operated during adverse, mean, and high water years;

(2) An estimate of the dependable capacity and average annual energy production in kilowatt-hours (or a mechanical equivalent), supported by the following data:

(i) The minimum, mean, and maximum recorded flows in cubic feet per second of the stream or other body of water at the powerplant intake or point of diversion, with a specification of any adjustments made for evaporation, leakage, minimum flow releases (including duration of releases), or other reductions in available flow; monthly flow duration curves indicating the period of record and the gauging stations used in deriving the curves; and a specification of the period of critical streamflow used to determine the dependable capacity;

(ii) An area-capacity curve showing the gross storage capacity and usable storage capacity of the impoundment, with a rule curve showing the proposed operation of the impoundment and how the usable storage capacity is to be utilized;

(iii) The estimated hydraulic capacity of the powerplant (minimum and maximum flow through the powerplant) in cubic feet per second;

(iv) A tailwater rating curve; and

(v) A curve showing powerplant capability versus head and specifying maximum, normal, and minimum heads;

(3) A statement, with load curves and tabular data, if necessary, of the manner in which the power generated at the project is to be utilized, including the amount of power to be used on-site, if any, the amount of power to be sold, and the identity of any proposed purchasers; and

(4) A statement of the applicant’s plans, if any, for future development of the project or of any other existing or proposed water power project on the stream or other body of water, indicating the approximate location and estimated installed capacity of the proposed developments.

Introduction

Southern California Edison (SCE) is the licensee, owner, and operator of the Lee Vining Hydroelectric Project (Project), Federal Energy Regulatory Commission (FERC) Project No. 1388, located on Lee Vining Creek near the community of Lee Vining in Mono County, California. Project facilities are located primarily within the Inyo National Forest (managed by the U.S. Forest Service [USFS]), as well as on some private lands. SCE currently operates the Project under a 30-year license issued by FERC on February 4, 1997. Because the current license will expire on January 31, 2027, SCE seeks a license renewal to continue Project operation and maintenance.

Project Operations

The Project consists of three dams and reservoirs, an auxiliary dam, a flowline consisting of a pipeline and penstock, and a powerhouse.

The Project is operated in compliance with existing regulatory requirements, agreements, and water rights to generate power. The following subsections describe operational constraints (regulatory requirements and operating agreements) associated with the Project, followed by a description of water rights associated with the Project.

(1) Type of Operation

SCE is not proposing any changes to the way the Project is operated or maintained. The powerhouse is automatically controlled from the Eastern Hydro Operations Center located in Bishop, California; however, the powerhouse can be operated manually should it be necessary.

The outlets at Saddlebag and Tioga Lakes are manually operated and adjusted for minimum flow requirements and storage management. A bypass outlet at Ellery Lake can be remotely operated to release flow during powerhouse outages. Flow through the powerhouse is manually adjusted and can be adjusted locally or remotely from the Eastern Hydro Operations Center.

(2) Capacity and Production

Poole Powerhouse is located on Lee Vining Creek east (downstream) of Ellery Lake and contains one General Electric generating unit with a generator nameplate capacity of 11.25 megawatts (MW) and one Pelton single overhung, horizontal-impulse turbine with a design capacity of 17,910 horsepower. Due to hydraulic limitations under the range of operating conditions, the Project has a demonstrated dependable capacity of 10.9 MW.

With adequate usable storage in the Ellery Lake to generate at full hydraulic capacity for over 13 hours, the dependable capacity of the Project is equal to the installed capacity of 11.25 MW. Based on the average annual generation, the annual plant factor is 26 percent.

Flow varies monthly, depending on the amount of run-off and on SCE's release schedule. Peak run-off generally occurs from May to August.

Poole Powerhouse is operated using storage and/or inflow from Ellery Lake. During periods of high streamflow that exceed powerhouse hydraulic capacity, the Project is operated at capacity (105 cubic feet per second [cfs]) and excess flow is spilled after Ellery Lake reaches full storage capacity. During periods of low flow, water is supplied to Ellery Lake via Tioga and Saddlebag Lakes, with outlets set to provided minimum flow requirements at each reservoir. Minimum flows are provided into Lee Vining Creek below Poole Powerhouse; when the powerhouse is offline, a release valve at Ellery Lake allows the Project to meet minimum flow requirements.

Based upon the 25-year period of record (1999 to 2023), the Project has an annual average generation of 25,763 megawatt hours (Table B-1).

Table B-1 Annual Plant Factor

Average Annual Generation	Authorized Capacity	Average Annual Plant Factor
25,763 MWh	11.25 MW	26%

MW = megawatt; MWh = megawatt hour

Minimum Instream Flow Requirements

Minimum flow requirements are different below each dam (USFS Condition No. 4 of current license, 78 FERC ¶ 61,110). Under the current license, minimum flow requirements are based on whether the water year is wet, normal, or dry, as well as the water inflow into each reservoir. A water year is considered "wet" when the annual precipitation was in the highest 30 percent of the previous years, back to 1966. A water year is "dry" when the precipitation is in the lowest 30 percent of the previous years, back to 1966. A "normal" water year is when it is neither wet nor dry. Under any new license, the methodology for determining a wet, normal, and/or dry year will be reviewed and modified as necessary.

Saddlebag Dam

Below Saddlebag Dam, the minimum instream flow requirements are determined annually in consultation with USFS, no later than May 1 of each calendar year. If SCE and USFS do not agree on flows, the following minimums apply year-round:

- 14 cfs for wet years
- 9 cfs for normal years
- 6 cfs for dry years

Tioga Dam and Tioga Auxiliary Dam

Below Tioga Dam, the flow requirements are different depending on the month, the water year, and the amount of inflow. The reservoir is kept low in the winter in preparation for spring run-off. The minimum instream flow requirements are determined annually in consultation with USFS, no later than May 1 of each calendar year. If SCE and USFS do not agree on flows, the following minimums apply:

- May through September:
    - In a wet or normal water year, if the inflow is less than 2 cfs, the flow requirement is equal to the inflow and cannot exceed 2 cfs. If the inflow is greater than 2 cfs, the flow requirement is 2 cfs until the lake water surface elevation is within 2 feet of the main spillway crest; once this level has been achieved, the flow changes to greater than 60 percent of the inflow.
    - In a dry water year, if the inflow is less than 2 cfs, the flow requirement is equal to the inflow and cannot exceed 2 cfs. If the inflow is greater than 2 cfs, the flow requirement is 2 cfs until the lake water surface elevation is within 2 feet of the main spillway crest; once this level has been achieved, then the flow changes to the natural inflow.
- October and November: the minimum flow is 2 cfs or the natural inflow.
- December through April: the minimum flow is equal to the natural flow.

Below Poole Powerhouse

Below Poole Powerhouse, the flow requirements are different depending on the month and the amount of inflow. The requirements are determined annually in consultation with the USFS, no later than May 1 of each calendar year. If SCE and USFS do not agree on flows, the following minimums apply:

- August through May: the flow requirement is 27 cfs or the natural flow, whichever is less.
- June and July: the flow requirement is 89 cfs or the natural flow, whichever is less.

(i) Average Available Flows

Flows released from Rhinedollar Dam either pass through the Project intake, measured by U.S. Geological Survey (USGS) gage 10287762 (Poole Powerplant Conduit Intake), or they are spilled from the dam and recorded by USGS gage 10287770 (Lee Vining Creek below Rhinedollar Dam). The mean daily flows from these two gage datasets were combined to determine total releases from the Rhinedollar Dam. The mean daily flow is approximately 39.6 cfs, and monthly mean flows range between 1.8 and 286.5 cfs. Data records indicate a handful of days where zero flow was released, while the maximum daily average release is 423 cfs. Peak recorded release within flow records occurred on June 21, 2017, with a peak flow below Rhinedollar Dam of 373 cfs and a powerhouse full capacity of 105 cfs, for a total release of 478 cfs.

Table B-2 reports data from USGS gages. Flow data was summed from two gage locations, Lee Vining Creek below Rhinedollar Dam (gage 10287760) and Poole Powerhouse Conduit Intake (gage 10287762), to represent total flow available for the Project. Monthly means were calculated from daily means. Minimums and maximums are from daily means. No adjustments were made for evaporation, leakage, minimum flow releases or other reductions; these are the sum of direct measurements from the two gages that account for total releases.

Table B-2 Monthly Mean, Minimum, and Maximum Flows (cfs) for Lee Vining Creek, Outlet from Ellery Lake, Sum of Rhinedollar Spill and Poole Powerhouse Flow

Water Year	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	June	July	Aug.	Sep.
1997–1998	27.03	18.50	10.13	17.48	25.75	31.26	30.93	31.03	136.67	181.34	54.94	29.30
1998–1999	26.03	24.13	16.10	18.74	12.06	13.00	20.30	85.30	140.86	66.14	26.71	18.03
1999–2000	17.49	3.79	1.82	16.39	15.28	15.97	31.10	82.41	108.45	41.39	24.23	14.87
2000–2001	17.00	20.67	17.23	15.65	13.86	16.03	24.00	94.53	34.63	21.94	10.88	9.89
2001–2002	16.98	21.43	13.68	12.45	15.36	16.52	33.37	61.58	99.12	38.61	18.00	12.01
2002–2003	15.35	24.04	17.29	20.03	18.46	19.29	19.60	74.65	139.98	49.45	17.97	14.20
2003–2004	18.59	24.13	23.58	18.88	21.55	34.13	46.13	70.78	80.99	39.23	16.71	10.27
2004–2005	12.45	26.03	24.90	22.03	19.53	22.56	29.15	114.52	167.77	142.34	42.29	23.83
2005–2006	25.55	34.00	23.71	23.35	22.07	22.55	30.23	123.64	257.23	144.75	56.29	35.10
2006–2007	39.42	27.08	39.00	25.45	12.00	22.10	28.61	70.94	47.57	24.91	9.28	8.47
2007–2008	17.77	15.04	10.05	11.84	11.37	13.43	23.33	76.92	95.50	43.55	13.52	14.21
2008–2009	12.71	13.58	17.03	10.87	12.04	14.55	30.23	106.23	89.83	52.68	24.78	20.92
2009–2010	26.18	17.32	17.03	16.42	13.36	15.55	20.80	41.91	164.93	112.96	29.81	24.43
2010–2011	35.07	37.20	44.42	29.30	18.46	17.03	51.77	80.26	190.39	204.97	116.61	63.30
2011–2012	41.48	16.70	7.31	3.74	4.09	3.79	27.36	65.61	40.57	22.10	14.68	11.33

Water Year	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	June	July	Aug.	Sep.
2012–2013	11.42	11.32	11.61	9.16	9.06	11.72	36.47	57.89	54.10	22.19	8.52	7.20
2013–2014	6.68	12.25	21.45	13.97	14.82	17.39	28.39	59.37	54.10	22.52	14.80	26.81
2014–2015	9.62	17.32	16.35	13.94	14.79	19.23	21.12	43.20	40.93	23.87	11.13	10.00
2015–2016	16.88	21.07	18.67	13.77	15.63	19.77	39.80	76.23	125.87	45.77	38.57	13.30
2016–2017	25.55	26.75	16.30	19.57	18.61	29.23	36.79	126.94	286.53	209.99	92.21	49.68
2017–2018	26.16	14.10	14.90	13.90	16.07	16.00	58.42	123.44	134.13	90.38	51.08	37.77
2018–2019	15.16	8.66	10.41	11.77	16.93	8.92	26.83	70.81	194.92	132.15	56.60	29.51
2019-2020	23.42	21.60	23.94	23.32	15.93	22.70	34.76	70.14	43.07	21.74	13.82	13.00
2020-2021	12.58	13.43	13.45	12.00	14.13	6.98	24.08	59.44	40.83	16.06	11.19	19.66
2021-2022	17.45	21.73	17.66	14.42	14.10	10.12	33.32	62.77	58.76	22.97	22.34	27.23
2022-2023	11.81	11.33	11.73	12.87	12.72	64.43	68.74	121.68	240.00	284.32	87.65	39.10
Mean	20.23	19.35	17.68	16.20	15.34	19.39	32.91	78.93	117.99	79.93	34.02	22.44
Maximum	134	67	171	74	52	145	159	244	423	407	163	100
Minimum	0	1	1.5	3.5	2.4	3.6	1.3	9.6	8.8	10	6.6	5.3

Source: USGS, 2023a and 2023b (USGS gage 10287762 and USGS gage 10287770)

Figure B-1 illustrates the historic trend for natural inflows into Lee Vining Creek from 1998 to 2023.

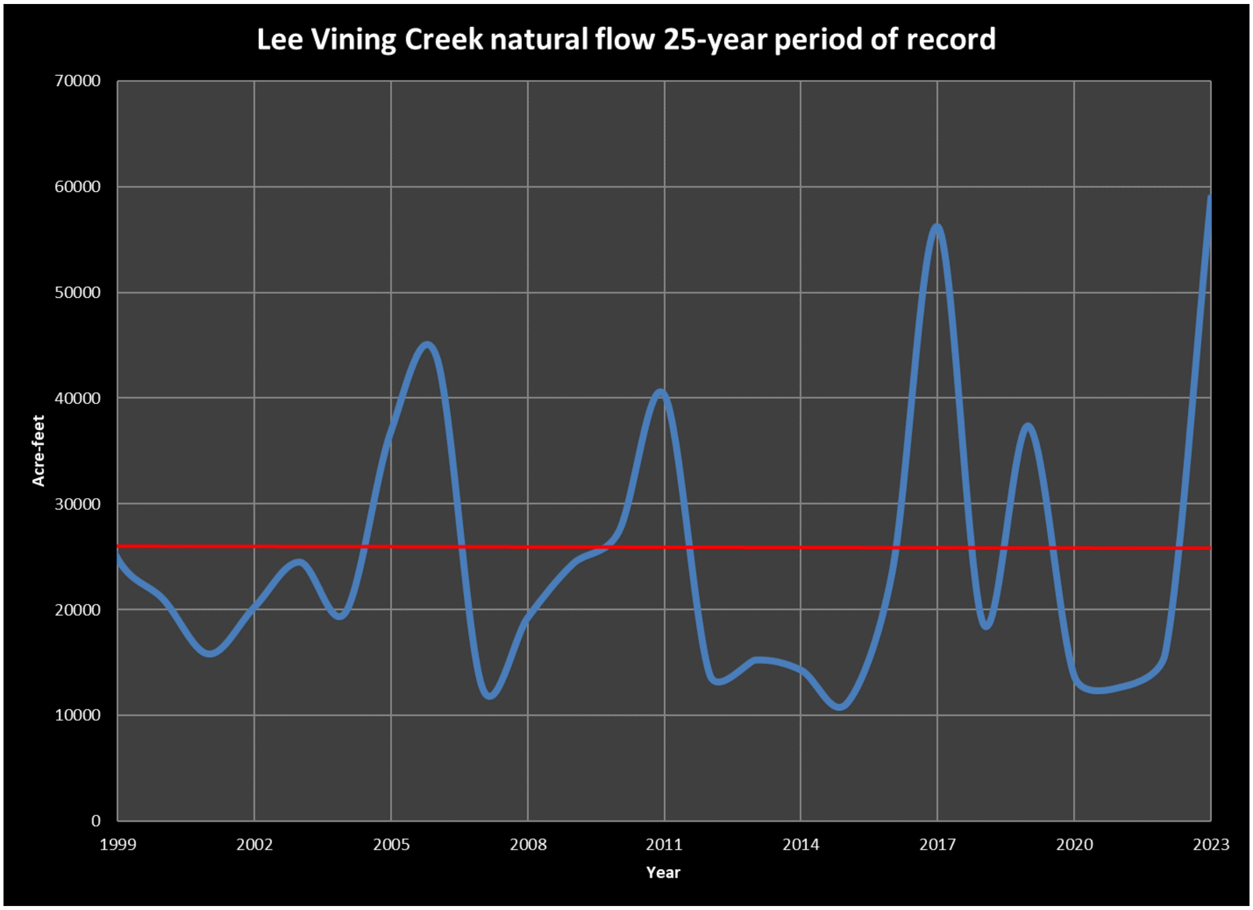

Figure B-1 Trend for Inflows—Lee Vining Creek (1999–2023)

Monthly precipitation observed at Ellery Lake Station for the last 10 years (2014 to 2023) is shown in Table B-3.

Table B-3 Monthly Precipitation Totals at Ellery Lake Station

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
2014	1.32	4.02	2.52	1.20	0.80	0.52	0.88	1.68	0.36	0.00	0.60	1.92	15.82
2015	0.28	2.12	0.52	1.24	3.12	1.16	2.92	0.48	0.36	1.68	2.16	3.42	19.46
2016	4.88	0.72	2.40	1.28	1.40	0.80	0.24	0.04	0.20	5.84	0.88	4.24	22.92
2017	11.34	7.98	1.56	2.60	0.56	0.16	0.00	0.76	0.80	0.20	3.02	0.12	29.1
2018	1.44	0.68	5.02	3.76	1.76	0.00	3.33	0.00	0.00	0.36	3.00	0.87	20.22
2019	3.42	6.16	3.40	0.84	1.40	0.20	0.68	0.16	0.00	0.00	0.00	3.86	20.12
2020	0.80	0.36	1.92	2.40	0.48	0.16	0.12	1.00	0.16	0.00	0.92	1.89	10.21
2021	2.51	1.00	1.76	0.28	0.63	0.64	2.12	0.00	0.04	4.93	0.52	6.04	20.47
2022	0.04	0.16	0.28	1.32	0.00	0.00	0.08	1.67	1.00	0.00	2.58	8.21	15.34
2023	14.30	13.60	3.90	0.08	0.87	1.60	0.04	1.86	1.26	0.64	1.50	1.18	40.83
2014–2023 (last 10 years)													
Maximum	14.3	13.6	5.02	3.76	3.12	1.16	3.33	1.86	1.26	5.84	3.02	8.21	40.83
Average	4.03	3.68	2.33	1.5	1.1	0.52	1.04	0.77	0.42	1.37	1.52	3.18	21.45
Minimum	.04	0.16	0.28	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	10.21
2019–2023 (last 5 years)													
Maximum	14.3	13.6	3.9	2.4	1.4	1.6	2.12	1.86	1.26	4.93	2.58	8.21	40.83
Average	4.21	4.26	2.25	0.98	0.68	0.52	0.61	0.94	0.49	1.11	1.1	4.24	21.39
Minimum	0.04	0.16	0.28	0.08	0.00	0.00	0.04	0.00	0.00	0.00	0.00	1.18	10.21

(ii) Impoundment Capacity

There are three reservoirs with storage capacity in the Project Area. Reservoir storage capacities and surface areas at normal full pond are shown in Table B-4.

Table B-4 Reservoir Capacities and Surface Areas

	Saddlebag Lake	Tioga Lake	Ellery Lake
Normal Full Pond Elevation	10,089.40 feet above sea level	9,650.28 feet above sea level	9,492.53 feet above sea level
Normal Maximum Surface Area	297 acres	73 acres	61 acres
Net Storage Capacity	9,765 acre-feet	1,254 acre-feet	493 acre-feet

Sources: SCE, 1997, 2018a, 2018b, 2019, 2020a, 2020b, 2023

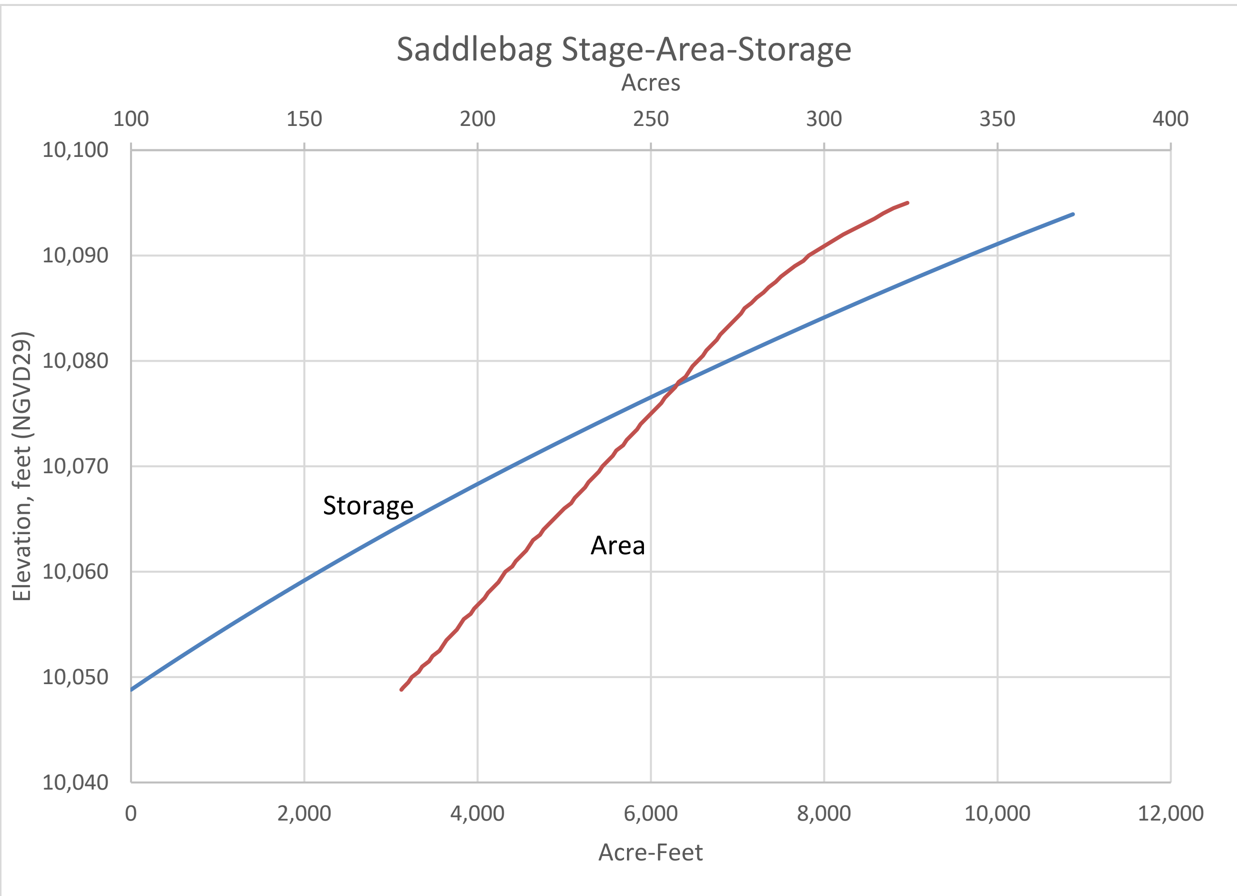

Figure B-2 Saddlebag Reservoir Storage and Area Curves.

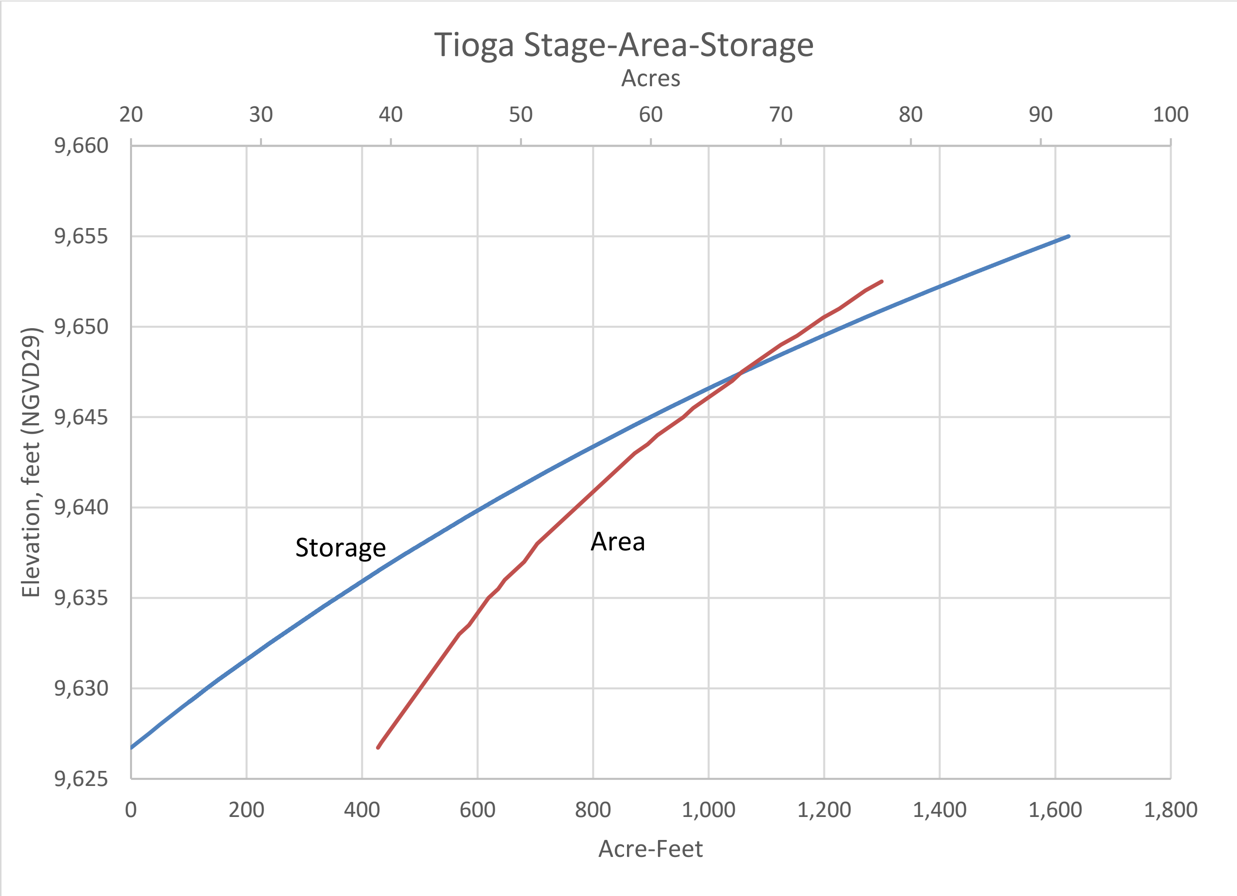

Figure B-3 Tioga Reservoir Storage and Area Curves.

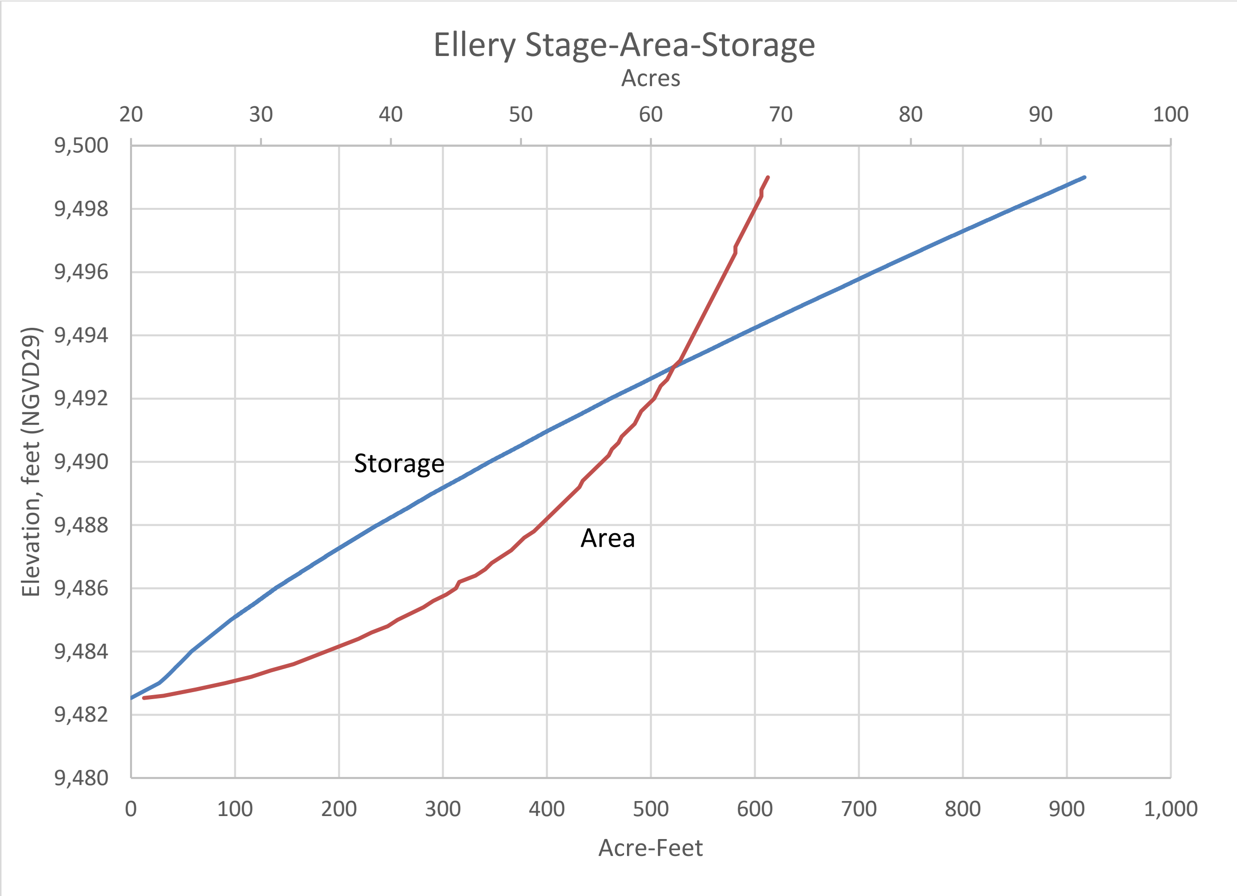

Figure B-4 Ellery Reservoir Storage and Area Curves.

(iii) Hydraulic Capacity

The single-unit powerhouse has a maximum hydraulic capacity of 105 cfs, and a minimum hydraulic capacity of approximately 6 cfs in dry periods but matches the natural inflow.

(iv) Tailwater Rating Curves

There is no tailwater curve for the Project. With a design head of 1,671 gross head (feet), reservoir fluctuation is insignificant at just 2 feet in the Ellery Reservoir. Similarly, tailwater increases do not affect Project capacity as the impulse-type turbine is set above tailwater elevation. Due to the lack of change in gross head associated with the small changes in intake reservoirs, a capacity versus head curve is not applicable.

(3) Use of Generated Energy

Power generated at the Project is utilized by SCE to meet demand for energy in its service area. A nominal portion of the output provides local power to operate Project facilities.

While meeting the Los Angeles Department of Water and Power Sales Agreement targets and the required FERC minimum flows, SCE also optimizes powerhouse generation to meet load requests from the California Independent System Operator. This process of delivering intraday load to satisfy demands is known as Hydro-resource Optimization. The Poole Powerhouse is typically activated during peak hours in response to grid demand. This operation leads to the release of flow into Lee Vining Creek below the Poole Powerhouse, with these instances generally lasting less than 8 hours.

(4) Plans for Future Development

SCE currently has no plans for further development of the Project operation or facilities.

References

SCE (Southern California Edison Company). 1997. Exhibit F Drawings from Lee Vining Project Final License Application.

SCE (Southern California Edison). 2015. *Southern California Edison Avian Protection Plan.*

SCE (Southern California Edison). 2016. *Nesting Bird Management Guidance for Small Projects*. April 2016.

SCE (Southern California Edison). 2017a. S*outhern California Edison Invasive Mussel Prevention Plan*. FERC Project No. 1388-CA. July 2017.

SCE (Southern California Edison). 2017b. *Southern California Edison Transmission and Distribution Vegetation Management Operations Manual (VMOM)*. 2017 Issue.

SCE (Southern California Edison). 2018a. *Supporting Technical Information Document, Saddlebag Lake Dam.* FERC Project No. 1388-CA. May 2018. Revised September 26, 2019.

SCE (Southern California Edison). 2018b. *Supporting Technical Information Document, Tioga Lake Dams*. FERC Project No. 1388-CA. May 2018.

SCE (Southern California Edison). 2019. *Supporting Technical Information Document, Rhinedollar Dam*. FERC Project No. 1388-CA. September 2019.

SCE (Southern California Edison). 2020a. *Supporting Technical Information Document, Rhinedollar Dam.* FERC Project No. 1388-CA. November 2020.

SCE (Southern California Edison). 2020b. *Supporting Technical Information Document, Saddlebag Lake Dam.* FERC Project No. 1388-CA. November 2020.

SCE (Southern California Edison). 2022. *Wildfire Mitigation Plan Update*.

SCE (Southern California Edison). 2023. *Supporting Technical Information Document, Tioga Lake Dams*. FERC Project No. 1388-CA. June 2023.

USGS (U.S. Geological Survey). 2023a. USGS 10287762 POOLE PP CONDUIT INTAKE NR LEE VINING CA. NWIS Site Information for USA: Site Inventory. U.S. Department of the Interior, U.S. Geological Survey, California Water Science Center. Accessed: May 9, 2024. Retrieved from: https://waterdata.usgs.gov/nwis/inventory?agency_code=USGS&site_no=10287762

USGS (U.S. Geological Survey). 2023b. USGS 10287770 LEE VINING C BL RHINEDOLLAR DAM NR LEE VINING CA. NWIS Site Information for USA: Site Inventory. U.S. Department of the Interior, U.S. Geological Survey, California Water Science Center. Accessed: May 9, 2024. Retrieved from: https://waterdata.usgs.gov/nwis/inventory?agency_code=USGS&site_no=10287770

White, D.R.M. 1990. *Management Plan for Historic and Archaeological Resources Associated with the Lee Vining Creek Hydroelectric Project (FERC Project No. 1388), Mono County, California*. Prepared for Southern California Edison Company, Rosemead, California. April.

SOUTHERN CALIFORNIA EDISON
LEE VINING HYDROELECTRIC PROJECT
(FERC PROJECT NO. 1388)

EXHIBIT C
DRAFT LICENSE APPLICATION

Energy for What's Ahead℠

September 2024

SOUTHERN CALIFORNIA EDISON

Lee Vining Hydroelectric Project
(FERC Project No. 1388)

Draft License Application
EXHIBIT C: Construction History and Proposed Construction Schedule

Southern California Edison
2244 Walnut Grove Ave
Rosemead, CA 91770

September 2024

Support from:

Kleinschmidt

Exhibit C: Construction History and Proposed Construction Schedule

Title 18 of the Code of Federal Regulations, Section 4.51 (License for Major Project—Existing Dam) includes a description of information that an applicant must include in Exhibit C of its license application.

Exhibit C is a construction history and proposed construction schedule for the project. The construction history and schedules must contain:

(1) If the application is for an initial license, a tabulated chronology of construction for the existing projects structures and facilities described under paragraph (b) of this section (Exhibit A), specifying for each structure or facility, to the extent possible, the actual or approximate dates (approximate dates must be identified as such) of:

- (i) Commencement and completion of construction or installation;
- (ii) Commencement of commercial operation; and
- (iii) Any additions or modifications other than routine maintenance; and

(2) If any new development is proposed, a proposed schedule describing the necessary work and specifying the intervals following issuance of a license when the work would be commenced and completed.

(1) Construction History

This application is not for an initial license. Therefore, a tabulated chronology of construction is not required. Refer to Exhibit H for a discussion of the history of the Lee Vining Hydroelectric Project and record of programs to upgrade the operation and maintenance of the Project (18 CFR § 4.51(d)(1)).

(2) New Development

The Project is an existing development, and no new construction or modification of any Project structures is proposed at this time.

SOUTHERN CALIFORNIA EDISON
LEE VINING HYDROELECTRIC PROJECT
(FERC PROJECT NO. 1388)

EXHIBIT D
DRAFT LICENSE APPLICATION

September 2024

SOUTHERN CALIFORNIA EDISON

Lee Vining Hydroelectric Project
(FERC Project No. 1388)

Draft License Application
EXHIBIT D: Project Costs and Financing

Southern California Edison
2244 Walnut Grove Avenue
Rosemead, CA 91770

September 2024

Support from:

Kleinschmidt

Exhibit D: Project Costs and Financing

Title 18 of the Code of Federal Regulations, Section 4.51 (License for Major Project—Existing Dam) includes a description of information that an applicant must include in Exhibit D of its license application.

Exhibit D is a statement of costs and financing. The statement must contain:

(1) If the application is for an initial license, a tabulated statement providing the actual or approximate original cost (approximate costs must be identified as such) of:

- (i) Any land or water right necessary to the existing project; and
- (ii) Each existing structure and facility described under paragraph (b) of this section (Exhibit A).

(2) If the Applicant is a licensee applying for a new license, and is not a municipality or a state, an estimate of the amount which would be payable if the project were to be taken over pursuant to section 14 of the Federal Power Act upon expiration of the license in effect [see 16 U.S.C. 807], including:

- (i) Fair value;
- (ii) Net investment; and
- (iii) Severance damages.

(3) If the application includes proposals for any new development, a statement of estimated costs, including:

- (i) The cost of any land or water rights necessary to the new development; and
- (ii) The cost of the new development work, with a specification of:
  - (A) Total cost of each major item;
  - (B) Indirect construction costs such as costs of construction equipment, camps, and commissaries;
  - (C) Interest during construction; and
  - (D) Overhead, construction, legal expenses, taxes, administrative and general expenses, and contingencies.

(4) A statement of the estimated average annual cost of the total project as proposed specifying any projected changes in the costs (life-cycle costs) over the estimated financing or licensing period if the applicant takes such changes into account, including:

- (i) Cost of capital (equity and debt);
- (ii) Local, state, and Federal taxes;
- (iii) Depreciation and amortization;
- (iv) Operation and maintenance expenses, including interim replacements, insurance, administrative and general expenses, and contingencies; and
- (v) The estimated capital cost and estimated annual operation and maintenance expense of each proposed environmental measure.

(5) A statement of the estimated annual value of project power, based on a showing of the contract price for sale of power or the estimated average annual cost of obtaining an equivalent amount of power (capacity and energy) from the lowest cost alternative source, specifying any projected changes in the cost of power from that source over the estimated financing or licensing period if the applicant takes such changes into account.

(6) A statement specifying the sources and extent of financing and annual revenues available to the applicant to meet the costs identified in paragraphs (e) (3) and (4) of this section.

(7) An estimate of the cost to develop the license application;

(8) The on-peak and off-peak values of project power, and the basis for estimating the values, for projects which are proposed to operate in a mode other than run-of-river; and

(9) The estimated average annual increase or decrease in project generation, and the estimated average annual increase or decrease of the value of project power, due to a change in project operations (i.e., minimum bypass flows; limits on reservoir fluctuations).

(1) Original Cost

This is not an application for an initial license. Therefore, a statement of the original cost of the Lee Vining Hydroelectric Project (Project) land or water rights, structures, or facilities is not applicable.

(2) Takeover Cost

It is the intent of Southern California Edison Company (SCE) to continue to operate the Project upon receipt of a new license. However, in the event the Project were to be taken over at the end of the license term, pursuant to Section 14 of the Federal Power Act, SCE would be entitled to receive their net investment plus severance damages. The amount payable to SCE in the event of a takeover, as provided in Section 14 of the Federal Power Act, includes the net investment, not to exceed fair value. Some of the principles bearing upon the final determination of fair value are yet to be ascertained. There are, however, some basic figures as to which there should be no substantial dispute. The net book value, which is the historical cost less accumulated depreciation, can be used as one proxy for fair value. SCE estimates the Project's total estimated net book value to be $14.6 million as of December 2023.

Pursuant to Section 14 of the Federal Power Act, SCE provides the following estimates in Table D-1.

Table D-1 Investment Estimates

Investment Type	Estimate
Fair Value	$14,584,424
Net Investment	$14,584,424
Severance Damages	$14,584,424

(3) Cost of New Development

SCE does not propose any new development as part of this application; therefore, a statement of the estimated cost of new development is not applicable.

(4) Cost of Financing

The annual costs for the Project include expenses for operation and maintenance (O&M) as well as capital improvement work.

(i) The current SCE Cost of Capital is listed in Table D-2.

Table D-2 Cost of Capital

Capital Type	Percentage
Long-Term Debt	1.89%
Preferred Equity	0.33%
Common Equity	5.23%
Total Cost of Capital	7.45%

(ii) Property taxes associated with the Project for 2023 were $249,326. State and federal income taxes are computed for all of the SCE Hydropower assets combined, and no amount is specifically designated for this individual Project.

(iii) Depreciation for the Project for 2023 was $780,353.

(iv) The average O&M expenses for the 5-year period (2019 to 2023) are $1,178,146. O&M expenses for 2023 totaled $1,336,175. Additional Administrative and General expenses totaled $386,438 in 2023.

(v) The estimated capital cost and estimated annual O&M expense of each proposed protection, mitigation, and enhancement will be provided for the Final License Application.

(5) <u>Value of Project Power</u>

The value of the Project power is quantified through three market products: energy value, capacity value, and renewable energy credits (RECs). Energy produced by the plant is valued based on California Independent System Operator wholesale market prices. Capacity value is based on expected future capacity prices. REC prices are based on the expected price to buy or sell RECs in the future.

The Project's projected value is determined by first estimating the production of the plants. The estimated annual amount of energy produced from the Project was derived from a 20-year annual average of historical production from 2004 to 2023.

The forecasted production (in megawatt hours [MWh]) for the Project was multiplied by the marginal energy cost forecast and the REC price forecast, and the expected capacity of the Project was multiplied by the marginal capacity cost forecast. The sum of the three products is the total value that SCE would expect from the power being provided by the Project.

SCE estimates the 2023 Energy Value to be $33.53 per MWh, the 2023 REC Value to be $30.30 per MWh, and the 2023 Capacity Value to be $172.44 per kilowatt year (refer to Exhibit E, Section 7.0, Developmental Analysis).

(6) Sources of Financing and Revenues

There is no new development planned for the Project, as such, special financing for any major capital work is not required.

SCE previously filed a General Rate Case with the California Public Utilities Commission, which was approved in August 2021. Included in that Rate Case filing were the generation-related O&M expenses as well as Administrative and General expenses. The General Rate Case filings included the expected costs for the years of 2021 to 2024, which are associated with the O&M of all the SCE Hydro assets, as well as the costs associated with any anticipated incremental capital additions. The capital and O&M expenses necessary for continued operation of the Project would be collected through those approved rates. Those approved rates would include costs associated with license condition requirements imposed upon the Project in the new license.

This Project is operated as a component of SCE's Hydro Generation Division, which is part of the Power Supply Department. Any financing charges required for individual projects would normally be included in the overall department budget and would not be directly attributable to the individual Project.

(7) License Application Development Cost

The cost of developing the license application will be provided with the Final License Application.

(8) Value of On-peak and Off-peak Project Power

SCE estimates the 2023 On-Peak Energy Value ($/MWh) to be $33.69 and the Off-Peak Energy Value to be $33.21. REC and Capacity values and prices are set and estimated in a monthly basis; therefore, On-Peak and Off-Peak values are not applicable.

(9) Effects of Change in Project Operations

The Proposed Action does not include changes to Project O&M activities; therefore, no changes are anticipated to Project Operations.

SOUTHERN CALIFORNIA EDISON
LEE VINING HYDROELECTRIC PROJECT
(FERC PROJECT NO. 1388)

EXHIBIT E
DRAFT LICENSE APPLICATION

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Lee Vining Hydroelectric Project
(FERC Project No. 1388)

Draft License Application
EXHIBIT E: Environmental Report

Southern California Edison
2244 Walnut Grove Avenue
Rosemead, CA 91770

September 2024

Support from:

Kleinschmidt

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List of Acronyms and Abbreviations

°C	degrees Celsius
°F	degrees Fahrenheit
µg/g	microgram per gram
µS/cm	microSiemens per centimeter
ABL	Aquatic Bioassessment Lab
ACHP	Advisory Council on Historic Preservation
ADA	Americans with Disabilities Act
AGOL	ArcGIS Online
amsl	above mean sea level
APE	Area of Potential Effects
AS	Above Saddlebag (site name)
ATL	Advisory Tissue Levels
Basin Plan	Water Quality Control Plan for the Lahontan Region
BCC	Birds of Conservation Concern
BE	built environment
BE	Below Ellery (site name)
BGEPA	Bald and Golden Eagle Protection Act
BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
BMI	benthic macroinvertebrate
BP	Before Present
BSO	Below Saddlebag (site name)
C.I.	Confidence Interval
CA	California
CAISO	California Independent System Operator
cal	calendar years
Cal-IPC	California Invasive Plant Council
CAL FIRE	California Department of Forestry and Fire Protection
CDFW	California Department of Fish and Wildlife
CEII	Critical Energy Infrastructure Information
CEQA	California Environmental Quality Act

CFGC	California Fish and Game Code
CFR	Code of Federal Regulations
cfs	cubic feet per second
cfu	colony forming units
CG	Campground
CMC	criterion maximum concentrations
COVID-19	coronavirus disease 2019
COMM	commercial or sport fishing
CRPR	California Rare Plant Rank
CSCI	California Stream Condition Index
CUL	Tribal Tradition and Culture
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
D_{50}	Particle Size Distribution D_{50}
DLA	Draft License Application
DO	dissolved oxygen
DPR	California Department of Parks and Recreation
DRI	Desert Research Institute
DSSMP	Dam Safety Surveillance and Monitoring Plan
DSSMR	Dam Safety Surveillance and Monitoring Report
EA	Environmental Assessment
EAP	Emergency Action Plan
EFH	Essential Fish Habitat
EI	Environmental Intelligence, LLC
EJ	environmental justice
EO	Executive Order
ESA	Endangered Species Act
FCE	Candidate as Federally Endangered
FCT	Candidate as Federally Threatened
FE	Federally Endangered
FERC	Federal Energy Regulatory Commission
FLA	Final License Application
FP	Fully Protected

FPA	Federal Power Act
fps	foot per second
ft^2	square feet
ft^3	cubic feet
FT	Federally Threatened
FW	Far Western Anthropological Research Group, Inc.
g/m^2	grams per square meter
GHG	greenhouse gas
GIS	geographic information system
GLO	General Land Office
gpd	gallons per day
GPS	Global Positioning System
H	Historic-period
HPMP	Historic Properties Management Plan
HRA	Historical Research Associates, Inc.
ID	identification
IRP	Integrated Resource Plan
ISO	[California] Independent System Operator
JAM	Joint Agency Meeting
ka	thousand years ago
KOP	Key Observation Point
kV	kilovolt
LADWP	Los Angeles Department of Water and Power
License Application	Application for a new license; submitted to FERC no less than 2 years in advance of expiration of an existing license
Licensee	Southern California Edison
LiDAR	Light Detection and Ranging imagery
LLV	Lower Lee Vining (site name)
LMP	Land Management Plan
LRWQCB	Lahontan Region Water Quality Control Board
LWCF	Land and Water Conservation Fund
LWD	large woody debris
m^2	square meters

M	Multicomponent
Magnuson-Stevens Act	Magnuson-Stevens Fishery Conservation and Management Act
MC	Mine Creek (site name)
mg	milligram
mg/L	microgram per liter
mg-N/L	milligrams nitrogen per liter
MIF	minimum instream flow
mL	milliliter
MLV	Middle Lee Vining (site name)
mm	millimeter
MPN	most probable number
MW	megawatt
MWh	megawatt-hour
N/A	data not available
NA	not applicable
n.d.	no date
NDVI	Normalized Difference Vegetation Index
NEPA	National Environmental Policy Act
NERC	North American Electric Reliability Corporation
NF	National Forest
NGO	non-governmental organization
NHPA	National Historic Preservation Act
NIR	near-infrared
NLCD	National Land Cover Database
NNIP	non-native invasive plant
NOI	Notice of Intent
NPPA	Native Plant Protection Act
NPS	National Park Service
NRCS	Natural Resources Conservation Services
NRHP	National Register of Historic Places
NTU	nephelometric turbidity unit
NV	Nevada

NVUM	National Visitor Use Monitoring [Program]
NWI	National Wetlands Inventory
O&M	operation and maintenance
OEHHA	Office of Environmental Health Hazard Assessment
P	Precontact
PAD	Pre-Application Document
PCT	Pacific Crest National Scenic Trail
pH	indicates acidity or alkalinity of a solution
PME	protection, mitigation, and enhancement
POD	Point of Diversion
ppt	parts per thousand
PQL	practical quantification limit
PQS	Professional Qualification Standards
Project	Lee Vining Hydroelectric Project (FERC Project No. 1388)
RCA	Riparian Conservation Area
Rd	Road
RG	Record Group
RMP	Risk Management Program
RPS	Renewables Portfolio Standard
RTE	rare, threatened, and endangered
RV	recreational vehicle
s.u.	standard unit
SB	Senate Bill
SCC	Species of Conservation Concern
SCE	Southern California Edison [Company]
SCORP	Statewide Comprehensive Outdoor Recreation Plan
SE	State Endangered
SGMC	State Geographic Map Compilation
SHPO	State Historic Preservation Office
SNARL	Sierra Nevada Aquatic Research Laboratory
SNC	Sierra Nevada College
SOI	Secretary of the Interior
SSC	Species of Special Concern

ST	State Threatened
SVOC	screening value
SWRCB	State Water Resources Control Board
TAN	total ammonia nitrogen
TCP	Traditional Cultural Property
TDS	total dissolved solids
TEAM	TEAM Environmental
TH	Trailhead
TLP	Traditional Licensing Process
TSS	total suspended solids
TWG	Technical Working Group
UCSB	University of California Santa Barbara
ULV	Upper Lee Vining (site name)
USC	Upper Slate Creek (site name)
USC	United States Code
USEPA	U.S. Environmental Protection Agency
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WECC	Western Electricity Coordinating Council
WILD	wildlife habitat
WPA	Works Progress Administration
WUA	weighted usable area
YOY	young-of-year

1.0 INTRODUCTION

Southern California Edison (SCE) Company is the Licensee, owner, and operator of the Lee Vining Hydroelectric Project (Project), Federal Energy Regulatory Commission (FERC) Project No. 1388 located on Lee Vining Creek near the community of Lee Vining in Inyo County, California. Lee Vining Project facilities are located within the Inyo National Forest (managed by the U.S. Forest Service [USFS]). The FERC Project Boundary includes some private lands owned by the Licensee. The Project consists of three dams and reservoirs, an auxiliary dam, a flowline consisting of a pipeline and penstock, and a powerhouse. SCE currently operates the Project under a 30-year license issued by FERC on February 4, 1997. The license will expire January 31, 2027. SCE is seeking a license renewal to continue its existing operation and maintenance (O&M) of the Project. Figure 1-1 provides an overview of the location and general layout of facilities relative to the FERC Project Boundary. SCE is not proposing any changes to Project O&M or any new construction.

The Project has an authorized capacity of 11.25 megawatts (MW) and an average annual energy production of 26,411 megawatt-hours (MWh). Under the proposed Project, the FERC Project Boundary includes 542.25 acres of land; of that, 535.99 acres (98.8 percent) of Project lands are federally owned and administered by the USFS and 6.26 acres (1.2 percent) are owned by SCE (Exhibit G, *Project Maps*).

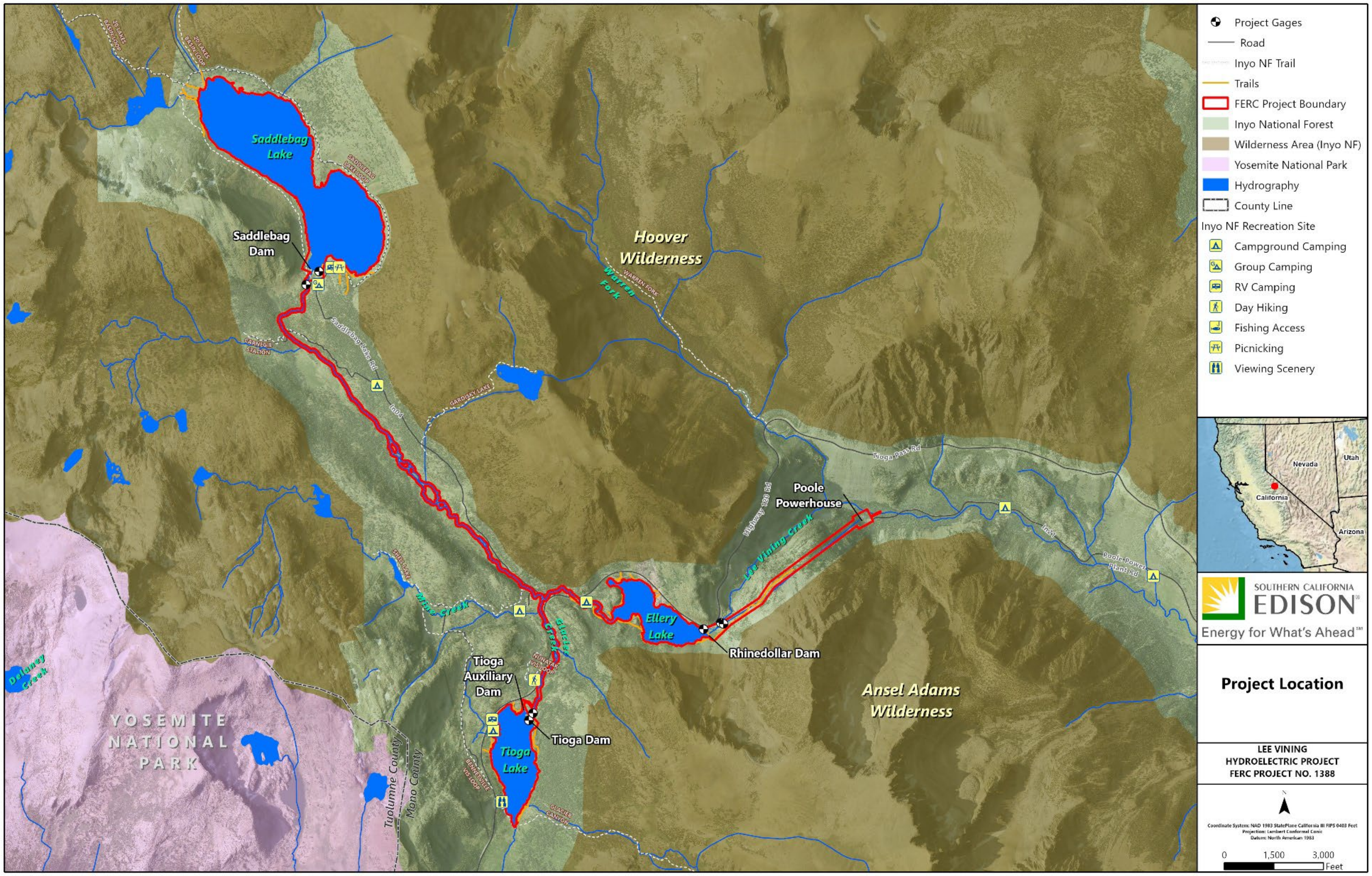


Figure 1-1. Project Location, Proposed FERC Project Boundary, and Facilities.

1.1. APPLICATION

SCE is applying to FERC for a new license for the existing Lee Vining Project. This draft Application for new license for Major Project—Existing Dam (License Application) was filed pursuant to FERC regulations in the Code of Federal Regulations, Title 18, Sections 4.32, 4.5, and 4.51 (18 CFR §§ 4.32, 4.5, and 4.51). This Exhibit E, *Environmental Report*, was prepared by SCE in support of the License Application. As approved by FERC on October 8, 2021, SCE is using the Traditional Licensing Process (TLP) to develop this License Application.

The Project is designated as FERC Project No. 1388 under a license issued on February 4, 1997, for 30 years, terminating on January 31, 2027. Through the filing of this License Application, SCE requests renewal of its license to continue O&M of the Project with a license term of 40 years.

1.2. PURPOSE AND NEED FOR POWER

1.2.1. PURPOSE OF ACTION

SCE proposes to continue Project O&M under a new license issued by FERC pursuant to the Federal Power Act (FPA). If FERC issues a new license, a key component is the conditions placed in the Project license to ensure compliance with the FPA and other applicable laws. In deciding whether to issue a 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 hydropower and other development 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.

The Draft License Application (DLA) was prepared in compliance with 18 CFR Part 4, which defines the form and content requirements of the document. The purpose of the DLA is to provide FERC, federal and state agencies, and other interested Stakeholders with information related to Project facilities as well as engineering, operational, economic, and environmental aspects of the Project. This License Application provides the information necessary for FERC to develop new license conditions for the Project. This exhibit presents a description and analysis of the environmental and economic effects of the No Action Alternative (No Action) and the Proposed Action Alternative (Proposed Action). Several other alternatives were considered but eliminated from detailed analysis because they were not considered reasonable, including federal government takeover, issuance of a non-power license, and retirement of the Project (refer to Section 5.0, *Other Alternatives*).

1.2.2. NEED FOR POWER

SCE is a public 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.

The Project would provide hydroelectric generation to meet part of SCE's power requirements, resource diversity, and capacity needs. The Project would have an installed capacity of 11.25 MW (10.9 MW estimated Dependable Capacity) and generate approximately 26,411 MWh (annual average from 1997 to 2022) per year.

The Poole 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 [kV] Casa Diablo line), the Poole 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 Poole Powerhouse provides a local source of backup 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 Poole 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 Poole 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 Poole Powerhouse to serve as backup power to local communities, there would be significant impacts to customers.

The Project uses water from Lee Vining Creek and its tributaries for water storage and power generation. Wintertime flows are regulated by the 1933 Sales Agreement (Sales Agreement) between Southern Sierras Power Company (predecessor to SCE) and the Los Angeles Department of Water and Power (LADWP).

1.2.2.1. Power Demand

The North American Electric Reliability Corporation (NERC) is a regulatory authority whose mission is to assure 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, 2024).

NERC monitors and enforces compliance with its reliability standards through six regional entities. 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, 2 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 16.8 percent from 2023 to 2033 (WECC, 2023). 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 surrounds projections of future energy demand and planned capacity 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.

1.2.2.2. California Legislation

Regulation of greenhouse gas (GHG) emissions in the United States and California is relatively recent, beginning early in the 2000s. In the absence of major federal efforts, former California governor Arnold Schwarzenegger and the state legislature took the initiative to establish goals for reductions of GHG emissions in California and to prescribe a regulatory approach to ensure that the goals would be achieved. The federal government, primarily through actions of the U.S. Environmental Protection Agency (USEPA), also regulates GHG emissions, although not as comprehensively.

California has continued to pursue extensive climate change policies. On September 8, 2016, former Governor Jerry Brown signed Senate Bill (SB) 32, which extends the state's target to reduce GHG emissions. The SB mandates a 40 percent reduction in GHG emissions below 1990 levels by 2030 and essentially builds 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 emissions vehicles on California's roadways, and curb emissions from key industries (Berkeley Law, 2024). By 2017, California's emissions were already below the 2020 target; however, the rate of reductions must continue to decrease to reach the SB 32 target by 2030 (Petek, 2020).

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, 2023). 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, 2023). California's long-term goal is to become carbon neutral by 2045, following Executive Order (EO) B-55-18 by Governor Gavin Newsom and the passage of SB 100 (CARB, 2023). 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, *Description of Project Management and Need for Project Power*).

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. Displacing the operation of fossil-fueled facilities may avoid some power plant emissions and creates an environmental benefit.

2.0 STATUTORY, REGULATORY REQUIREMENTS, AND APPLICABLE LAWS

SCE, as Licensee for the Project, is subject to the requirements of the FPA and other applicable statutes. The FPA gives FERC legal authority to issue licenses to non-federal hydropower projects. Major regulatory and statutory requirements are summarized below.

2.1. 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.

2.1.1. 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 proposed Project occupies approximately 536 acres of federally owned lands within Inyo National Forest. FERC will solicit FPA Section 4(e) conditions from USFS after the Final License Application (FLA) is filed.

2.1.2. SECTION 10(J) RECOMMENDATIONS

Under Section 10(j) of the FPA, each license issued by FERC shall include conditions based on recommendations provided by federal and state fish and wildlife agencies for the protection, mitigation, or 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 laws. 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. FERC will solicit FPA Section 10(j) recommendations after the FLA is filed.

2.1.3. SECTION 18 FISHWAY PRESCRIPTIONS

Section 18 of the FPA states that 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. FERC will solicit FPA Section 18 prescriptions after the FLA is filed in 2025.

2.2. 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 (SWRCB) was designated by the USEPA as the water pollution control agency with authority to implement the CWA in California.

In accordance with 18 CFR § 5.23, 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.

2.3. ENDANGERED SPECIES ACT

Section 7 of the federal 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.

FERC initiated informal consultation with the U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service under Section 7 of the ESA on October 8, 2021, and on that same date designated SCE as FERC's non-federal representative for informal consultation under Section 7. Since this designation, SCE has held workshops and conference calls with agencies responsible for implementing ESA consultation to better evaluate possible effects to those species potentially impacted by the Proposed Action.

Discussion of the Project's potential effects on threatened and endangered species are provided in Section 6.9, *Rare, Threatened, and Endangered Species*.

2.4. MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT

The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) requires federal agencies to consult with National Marine Fisheries Service on all actions that may adversely affect Essential Fish Habitat (EFH).

On October 8, 2021, FERC designated SCE as the non-federal representative for execution of informal consultation under Section 305(b) of the Magnuson-Stevens Act. SCE reviewed EFH designations for the west coast (NOAA, 2023) and determined that relicensing the Project, as proposed by SCE, will not adversely affect designated EFH.

2.5. 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 included 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 management program review, and no consistency certification is needed for the action. By letter dated May 11, 2022, the California Coastal Commission concurred (see *Consultation Log*, which is included in Volume II of this DLA).

2.6. NATIONAL HISTORIC PRESERVATION ACT

Section 106 of the National Historic Preservation Act (NHPA; 16 United States Code [USC] § 470f) and its implementing regulations in 36 CFR Part 800 requires that federal agencies take into account their undertakings on historic properties. The NHPA (54 USC § 300308) defines an historic property or historic resource as any "prehistoric [pre-contact] or historic district, site, building, structure, or object included in, or eligible for inclusion on, the National Register of Historic Places (NRHP), including artifacts, records, and material remains related to such a property or resource."

FERC initiated informal consultation with the California State Historic Preservation Office (SHPO) under Section 106 on October 8, 2021, and on that same date designated SCE as FERC's non-federal representative for informal consultation under Section 106 and its implementing regulations. In a letter dated January 11, 2022, SCE on behalf of FERC initiated consultation with the SHPO and requested concurrence on the Area of Potential Effects (APE). By letter dated March 23, 2022, the SHPO pursuant to 36 CFR § 800.4(a)(1), found the APE as defined to be sufficient for the undertaking.

Discussion of potential Project effects on historic properties is provided in Section 6.13, *Cultural Resources*, and Section 6.14, *Tribal Resources*, of this Exhibit E. SCE anticipates that to meet the requirements of Section 106, FERC will execute a Programmatic Agreement for the protection of historic properties from the effects of the ongoing O&M of the Project under a new license issued by FERC. SCE intends to file an Historic Properties Management Plan (HPMP) concurrent with its filing of the FLA. A record of non-confidential consultation is included in the *Consultation Log* (Volume II of this DLA).

2.7. WILD AND SCENIC RIVERS ACT AND WILDERNESS ACT

Section 7(a) of the Wild and Scenic Rivers Act requires federal agencies to make a determination as to whether the operation of the Project under a new license would invade the area or unreasonably diminish the scenic, recreational, and fish and wildlife values present in the designated river corridor.

Lee Vining Creek and its tributaries are not designated by Congress as Wild and Scenic Rivers; however, the 2019 Inyo National Forest Land Management Plan (LMP) (USFS, 2019) identified over 75 miles of river in the Mono Basin as eligible for inclusion in the National Wild and Scenic Rivers System, including all of Lee Vining Creek. While the LMP does not designate Lee Vining Creek as part of the National Wild and Scenic Rivers System, it recognizes it as eligible for future designation due to its outstanding natural, cultural, or recreational values. Wild and Scenic River eligibility affects future management decisions on the Inyo National Forest, and it opens the possibility for future designation by Congress (USFS, 2019). In accordance with the 2012 Planning Rule,[1] the USFS 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.

Section 4(c) of the Wilderness Act of 1964, 16 USC 1133(c) prohibits any commercial enterprise, structure, or installation within designated wilderness areas, except for existing private rights or activities authorized by the President of the United States. The Project does not occupy any land within a Congressionally designated wilderness area (USFS, 2023).

2.8. Public Review and Consultation

FERC's regulations (18 CFR § 16.8) require that applicants consult with appropriate resource agencies, Tribes, and other entities before filing an application for a new license. A complete log of communications with Stakeholders is included in the *Consultation Log* (see Volume II of this DLA). A list of names and addresses of federal, state, and interstate resource agencies, Native American Tribes, non-governmental organizations (NGOs), and individual, unaffiliated members of the public with which SCE consulted in preparation of this document is provided in the Distribution List included with the Cover Letter to this DLA filing.

2.8.1. Scoping of Initial Issues

Prior to the filing of the Pre-Application Document (PAD), SCE formed Technical Working Groups (TWGs) with representatives from federal and state agencies, Tribes, NGOs, and interested members of the public. Four TWGs were created including the Aquatics and Hydrology TWG, Terrestrial and Botanical TWG, Recreation and Land Use TWG, and Cultural and Tribal TWG. These groups met to identify and discuss resource issues and develop recommendations for addressing and resolving them (TWG meeting notes are included as part of the *Consultation Log* [Volume II of this DLA] and available on the Project website). SCE developed Draft Technical Study Plans (Study Plans), which were filed with the PAD.

2.8.2. First Stage Consultation

The Notice of Intent (NOI), PAD, and draft Study Plans for the Project were filed with FERC on August 12, 2021. SCE published public notices of the filing in the *Sheet News* on August 7, 2021, and the *Mammoth Times* on September 1, 2021. FERC approved the use of the TLP on October 8, 2021. SCE conducted a site visit and Joint Agency Meeting (JAM) on September 28 and November 16, 2021, respectively. The site visit and JAM were held separately in an effort to avoid any potential weather-related access concerns. Comments on the PAD were due to FERC on January 24, 2022. SCE reviewed all comments received and drafted revised Study Plans that were distributed to the TWGs on February 18, 2022, for another round of review. Stakeholder comments on the revised Study Plans were reviewed and incorporated as appropriate to the Final Study Plans filed

[1] 36 CFR 219.7(c)(2)(vi)

with FERC on April 25, 2022. A response to comment matrix was included in each Final Study Plan. Table 2.8-1 provides a summary of consultation correspondence over the course of the relicensing process to date, including development and filing of the draft and revised Study Plans, Final Technical Reports (included in Volume III of this DLA), and associated agency meeting summaries.

Table 2.8-1. Select Project Consultation 2020–Present

Year	Summary
2020	• May: Early Stakeholder engagement • October 6: Public Project kickoff meetings • November 17: Initial TWG meeting
2021	• January, February, March, and May: Resource group-specific TWG meetings • February: Study requests received from Stakeholders • August 12: NOI and PAD filed with FERC • September 28: Site Visit • October 8: FERC approved TLP • November 16: JAM
2022	• February 18: Revised Study Plans distributed to TWGs • March 28: Study Plan meeting • April 25: Final Study Plans filed with FERC
2023	• January 23: Distributed Technical Study Plan memorandums to TWGs • February 1: Progress Report meeting • March and April: Recreation and Land Use TWGs • April 19: Cultural and Tribal TWG • May 18: Aquatics and Hydrology TWG • September 13: Distributed three 2022 Draft Technical Reports to TWGs—Stream and Reservoir Water Quality (WQ-1), Reservoir Fish Populations (AQ-1), Stream Fish Populations (AQ-2), and General Botanical Resources Survey (TERR-1) for 60-day review period
2024	• February 28: Recreation and Land Use TWG • April 16: Distributed all remaining Draft Technical Reports to TWGs for 60-day review period • May 6: Cultural Section of DLA provided to Tribes for review • May 14: Technical Report and Effects Stakeholder Meeting • June 11: PME Meeting 1 • June 27: PME Meeting 2 • August 1: PME Meeting 3 • August 15: PME Meeting 4

FERC = Federal Energy Regulatory Commission; JAM = Joint Agency Meeting; NOI = Notice of Intent; PAD = Pre-Application Document; PME = protection, mitigation, and enhancement; TLP = Traditional Licensing Process; TWG = Technical Working Group

2.8.3. SECOND STAGE CONSULTATION

Resource studies were performed in 2022, 2023, and 2024 in accordance with the Final Technical Study Plans. A Progress Report including Technical Memos was distributed to TWGs in January 2023. Draft Technical Reports for completed studies were distributed to Stakeholders as specified in the Study Plans in April 2024 for a 60-day review period. Draft Technical Reports and initial study results were discussed at the May 14, 2024, Technical Report and Effects Stakeholder Meeting, which took place in Lee Vining, California. Table 2.8-2 includes a list of studies completed for the Project and the section of this Exhibit E in which they are discussed. Comments received on the memos and reports have been incorporated, as appropriate, into the Final Technical Reports, which are filed as Volume III of this DLA.

Table 2.8-2. Study Implementation Status for the Project

Study	Status / Exhibit E Section
Reservoir Fish Populations (AQ-1)	Completed in 2022 / Section 6.5
Stream Fish Populations (AQ-2)	Completed in 2022 / Section 6.5
Stream and Reservoir Water Quality (WQ-1)	Completed in 2023 / Section 6.4
General Botanical Resources Survey (TERR-1)	Completed in 2023 / Section 6.7
Operations Model (AQ-5)	Completed in 2024 / Section 6.4
Aquatic Habitat Mapping and Sediment Characterization (AQ-3)	Completed in 2023 / Section 6.5
Aquatic Invasive Plants (AQ-4)	Completed in 2023 / Section 6.5
Lower Lee Vining Creek Channel Morphology (AQ-6)	Completed in 2023 / Section 6.3
General Wildlife Resources Survey (TERR-2)	Completed in 2023 / Section 6.6
Recreation Use Assessment (REC-1) [a]	In progress in 2024 / Section 6.10
Existing Recreation Facilities Condition Assessment (REC-2)	Completed in 2023 / Section 6.10
Project Lands and Roads (LAND-1)	Completed in 2024 / Section 6.11
Visual Resource Assessment (LAND-2)	Completed in 2023 / Section 6.12
Cultural Resource (CUL-1)	Completed in 2023 & 2024 / Section 6.13
Tribal Resource (TRI-1)	In progress in 2024 / Section 6.14

[a] This study is ongoing as of the filing of the DLA. A draft report will be filed with the FLA.

As previously noted, the DLA, which includes this Exhibit E, is being submitted to consulting parties for review; comments on the DLA are due within 90 days of the date of this filing (by November 25, 2024).

2.8.4. THIRD STAGE CONSULTATION

SCE plans to file an FLA with FERC no later than January 31, 2025. The FLA will incorporate or discuss any comments submitted in response to this DLA by Stakeholders.

3.0 NO ACTION

The No Action is the baseline from which to compare the Proposed Action and all action alternatives that are assessed within this document. Under the No Action for relicenses, the Project would continue to operate under the terms and conditions of the current license.

The Project is more thoroughly described in Exhibit A, *Description of the Project*, and Exhibit B, *Statement of Operation and Resource Utilization*, of this DLA. However, a brief description of the Project and facilities is provided below as a reference for later discussions.

3.1. EXISTING PROJECT FACILITIES

The 11.25-megawatt Project consists of three dams and reservoirs, an auxiliary dam, a flowline consisting of a pipeline and penstock, and the Poole Powerhouse. Project facilities are described in greater detail in Exhibit A. A list of Project facilities is included in Table 3.1-1.

Table 3.1-1. List of Facilities Used for Hydroelectric Generation

General Location	Facility/Structure
Saddlebag Lake	Saddlebag Lake
	Saddlebag Dam and spillway
	Saddlebag valve house
	Saddlebag gate valve and steel pipe
	Access roads at Saddlebag Dam
Tioga Lake	Tioga Lake
	Tioga Dam and spillway
	Tioga Auxiliary Dam
	Tioga valve house
	Tioga gate valve, steel pipe, trashracks
	Access road at Tioga Dam and Auxiliary Dam
Ellery Lake / Rhinedollar Dam	Ellery Lake
	Rhinedollar Dam and spillway with radial gates
	Rhinedollar valve house
	Tunnel intake with trashracks
	Rhinedollar gate valve, Pelton butterfly valve, trashracks

General Location	Facility/Structure
Powerhouse	Poole Powerhouse
	Turbine
	Motor-operated gate valve and bypass
	Tailrace
	Switchyard
	Historic housing apartment complex
	Equipment garage
	Shop/storage garage
Other Project Works	Flowline (pipeline and penstock)
	Seven SCE/USGS Gaging stations
	Non-Project Transmission Facilities—None, transmission line was removed from license in 2001
	Fiber optic line to Poole Powerhouse for remote operation

SCE = Southern California Edison; USGS = U.S. Geological Survey

3.1.1. Powerhouse

The Poole Powerhouse is a reinforced concrete building constructed in the 1920s. It is located on Lee Vining Creek east (downstream) of Ellery Lake. The building is 68 feet long, 38 feet wide, 43 feet high, and has a substructure that is 18 feet deep. The powerhouse control panel is located on the ground floor. The powerhouse contains a restroom, storage room, battery room, operator’s desk, and a five-panel switchboard.

The powerhouse contains one General Electric generating unit with a nameplate capacity of 11.25 MW. The Project has one Pelton single-overhung, horizontal-impulse turbine with a design capacity of 17,910 horsepower with a hydraulic capacity of 105 cubic feet per second (cfs).

There is a turbine shutoff valve to isolate the unit. The powerhouse is unmanned but is continuously monitored at the Bishop Control Center via the supervisory control and data acquisition system.

The switchyard is located immediately north of the powerhouse and contains the main power transformers. Galvanized structural steel switchracks support the switchgear, busses, and related equipment. The generator is connected to the transformer bank through a 7 kV, 1,200-amp circuit breaker.

3.1.2. Reservoirs

3.1.2.1. Saddlebag Lake

Saddlebag Lake is in the headwaters of Lee Vining Creek. It is the lake farthest north of the Project and highest in elevation. The drainage area is approximately 4.5 square miles. Saddlebag Lake is generally drawn down in the winter to allow storage capacity for spring run-off. Saddlebag Lake is 297 acres, which has a net storage capacity of 9,765 acre-feet (SCE, 2020b). Saddlebag Lake previously had a storage capacity of 9,789 acre-feet at normal maximum reservoir level (elevation 10,090.4 feet); however, in 2013, the spillway crest elevation was lowered to 10,089.4 feet, resulting in the current reservoir net storage capacity of 9,765 acre-feet (SCE, 2020b).

3.1.2.2. Tioga Lake

Tioga Lake is in the headwaters of Glacier Creek, which then drains into Lee Vining Creek. It is the lake farthest south in the Project. The drainage area is approximately 4.03 square miles (SCE, 2018). Tioga Lake is generally drawn down in the winter to allow storage capacity for spring run-off. Tioga Lake has two dams: the main Tioga Dam and the Tioga Auxiliary Dam. Tioga Lake is 73 acres, which has a gross storage capacity of 2,175 acre-feet (SCE, 2018). The net storage capacity is 1,254 acre-feet (SCE, 2023).

3.1.2.3. Ellery Lake

Ellery Lake is on Lee Vining Creek downstream of the confluence with Glacier Creek; both Saddlebag and Tioga Lakes drain to Ellery Lake. Ellery Lake is the smallest and farthest east of the three Project lakes; however, the drainage area is the largest at 16.7 square miles (USGS, 2020). Ellery Lake is the forebay for the Poole Powerhouse, and its storage level is not varied as much as either Saddlebag or Tioga Lakes. Ellery Lake is 61 acres, which has a gross storage capacity of 493 acre-feet (SCE, 2020a).

3.1.3. Diversions and Dams

3.1.3.1. Saddlebag Dam

Saddlebag Dam is located on Saddlebag Lake in the headwaters of Lee Vining Creek. The dam is 45 feet high and 600 feet long, geomembrane-lined, redwood-faced, and composed of rockfill (SCE, 2020b). The dam impounds the 297-acre Saddlebag Lake.

3.1.3.2. Tioga Dam and Auxiliary Dam

Tioga Dam and the Tioga Auxiliary Dam are located on Tioga Lake in the headwaters of Glacier Creek, which then drains into Lee Vining Creek. Tioga Dam is a 27-foot-high, 270-foot-long, redwood-faced, rockfill dam (SCE, 2023). Tioga Auxiliary Dam is a 19-foot-high, 50-foot-long, constant radius concrete-arch dam (only the top 5 feet are visible due to backfill; SCE, 2023). These dams together impound the 73-acre Tioga Lake.

3.1.3.3. Rhinedollar Dam

Rhinedollar Dam is located on Ellery Lake, on Lee Vining Creek, downstream of the confluence with Glacier Creek; both Saddlebag and Tioga Lakes drain into Ellery Lake. The Rhinedollar Dam is an 18.5-foot-high (17 feet with a 1.5-foot concrete parapet), 437-foot-long rockfill dam that impounds the 61-acre Ellery Lake (SCE, 2020a). Releases from the reservoir flow down Lee Vining Creek (via the spillway or side outlet flow) or is diverted via the penstock to the Poole Powerhouse (SCE, 2020a).

3.1.4. Flowline/Penstock/Conveyance System

The Project's 6,271-foot-long flowline consists of a pipeline and a penstock; water is conveyed from Ellery Lake to the Poole Powerhouse though the penstock. The pipeline is 2,530 feet long and 48 inches in diameter (SCE, 2020b); it is composed of double riveted lap joint steel pipe. The Project's penstock is 3,741 feet long and 28 to 44 inches in diameter (SCE, 2020b); it is composed of lap welded steel and has a maximum flow of 110 cfs (SCE, 2020b). The flowline features are below ground in a tunnel extending from Rhinedollar Dam to Poole Powerhouse.

3.1.5. Intakes

3.1.5.1. Saddlebag Dam

Water is released to the downstream channel via the low-level outlets. The intake is a fully submerged, ungated, concrete intake box at the upstream toe of the dam (SCE, 2020b). The intake elevation is 10,048.8 feet (FERC, 1997).

3.1.5.2. Tioga Dam

As there are no power generation facilities associated with the dams, there is no intake at Tioga Dam or the auxiliary dam (SCE, 2023). The invert elevation of the outlet pipe at the upstream side is 9,626 feet (SCE, 2023).

3.1.5.3. Rhinedollar Dam

The Project's reinforced concrete intake structure is located at Rhinedollar Dam. It is protected by a single set of trash racks. Water flows under the dam through a 48-inch steel pipe encased in 8 inches of concrete (SCE, 2020a).

3.1.6. Transmission Lines

The primary transmission line runs between Poole Powerhouse and the switchyard and is approximately 50-feet long.

A single-line diagram shows the transfer of electricity from the Project to the transmission grid (*Single-Line Diagram*, filed as Critical Energy Infrastructure Information [CEII] in Volume IV of this DLA).

3.1.7. Gages

There are Project-associated stream gages immediately downstream of Saddlebag Dam and Tioga Dam, in stream. These gages continuously collect streamflow data, which is monitored and recorded at the Bishop Control Center.

There are seven SCE owned and operated stream gages located in the Project Area that are actively recording data. The U.S. Geological Survey (USGS) maintains a contract with SCE to review and publish the streamflow records at these gages to satisfy the existing FERC license requirements. The seven gages in the Project Area are shown in Table 3.1-2.

Table 3.1-2. SCE Gaging Stations

SCE Gage No.	USGS Gage No.	Location
353	10287770	In stream, Lee Vining Creek below Ellery Lake
354	10287655	In stream, Lee Vining Creek below Saddlebag Lake
356	10287760	In reservoir, Ellery Lake (Rhinedollar Reservoir)
360	10287650	In reservoir, Saddlebag Lake
361	10287700	In reservoir, Tioga Lake
363	10287762	In stream, Poole Powerhouse Use (acoustic velocity meter)
368	10287720	In stream, Glacier Creek below Tioga Lake

SCE = Southern California Edison; USGS = U.S. Geological Survey

3.1.8. Access Roads and Trails

No access roads or trails are part of the No Action for the Project.

3.1.9. Ancillary and Support Facilities

The Poole Powerhouse facility includes three detached ancillary buildings. One adjacent structure was historically a three-family construction and operators housing apartment complex. Two smaller buildings are a garage for storing equipment and materials and a shop/storage garage that has parts and other materials.

A fiber optic line that runs to Poole Powerhouse allows remote operation and is controlled at the Bishop Control Center.

3.2. FERC Project Boundary

The FERC Project Boundary includes facilities and lands necessary for Project O&M, as described above in Section 3.1, *Existing Project Facilities*.

Under the No Action, the FERC Project Boundary encompasses 615.47 acres, including 595.35 acres (97 percent) of public lands administered by the USFS and 20.12 acres (3 percent) of SCE-owned land. No Tribal lands are within the FERC Project Boundary.

3.3. PROJECT OPERATIONS

The Project is operated in compliance with existing regulatory requirements, agreements, and water rights to generate power. The following subsections describe operational constraints (regulatory requirements and operating agreements) associated with the Project, followed by a description of water rights associated with the Project.

3.3.1. REGULATORY REQUIREMENTS

3.3.1.1. FERC License

FERC issued the current Project license to SCE on February 4, 1997. FERC has issued various administrative Orders approving management and monitoring plans, as well as design drawings that were required as part of the current license. The license has subsequently been amended by FERC at various times that include revisions to License Articles and deletions of License Articles. License conditions and management plans related to current Project O&M are summarized below in Section 3.5, *Existing Environmental Measures*.

The Project is also subject to Articles 1–23 of the FERC's standard terms and conditions set forth in Form L-1 (October 1975), entitled *Terms and Conditions of License for Constructed Major Project Affecting the Lands of the United States*, 54 Federal Power Commission 1792, 1799.

3.3.1.2. Water Rights

In 1989, SCE worked with FERC to obtain archive records showing that they possessed sufficient pre-1914 water rights for Lee Vining. SCE's pre-1914 water right on Lee Vining Creek is based on two court cases: *Mono County v. Adam Farrington, et al.*; and *Cain Irrigation v. J.S. Cain*. The Hancock (presiding judge) decision awarded water and storage rights on Lee Vining Creek to Mono County Irrigation Company.

SCE's water rights for power consumption are documented in the Electronic Water Rights Information Management System (SWRCB, 2024) and are included in Table 3.3-1.

Table 3.3-1. SCE Water Rights for Power Consumption

Application Number	Permit ID	License ID	Status	Status Date	cfs
A026538	020892	--	Permitted	09/24/1980	60
A026539B	020894	--	Permitted	01/22/1997	50
A026537	020891	--	Permitted	09/24/1980	30
A000051	000081	000622	Licensed	06/03/1915	40

Application Number	Permit ID	License ID	Status	Status Date	cfs
A005068	002620	000623	Licensed	06/22/1926	30

Source: SWRCB, 2024

cfs = cubic feet per second

3.3.2. Water Management

SCE manages the Project in accordance with the Sales Agreement, FERC License Conditions, including minimum instream flow (MIF) requirements, and existing water rights.

3.3.2.1. Water Surface Elevation and Gross Storage Capacity

Table 3.3-2 provides reservoir elevations and capacities for the reservoirs.

Table 3.3-2. Reservoir Elevations and Capacities

Dimension	Saddlebag Lake	Tioga Lake	Ellery Lake
Normal Maximum Surface Area	297 acres	73 acres	61 acres
Normal Full Pond Elevation	10,089.40 feet above sea level	9,650.28 feet above sea level	9,492.53 feet above sea level
Net Storage Capacity	9,765 acre-feet	1,254 acre-feet	493 acre-feet

3.3.2.2. Hydraulic Capacity of Turbines and Generators

The powerhouse contains one air-cooled General Electric direct-connect type AT1 generating unit with a nameplate capacity of 11.25 MW and Dependable Capacity of 10.9 MW. The generator is rated at 11,250 kilowatts, 0.9 power factor, 7.5 kV, three-phase, 60 hertz.

The Project has one Pelton single jet, single-overhung, horizontal-impulse turbine with a rated design capacity of 17,910 horsepower, design head 1,550 feet, rated at 1,531 feet, 360 rotations per minute, with a hydraulic capacity of 105 cfs.

3.3.2.3. Estimate of Dependable Capacity

SCE defines Maximum Dependable Capacity to be the maximum load-carrying capacity of the generating unit based upon single unit load tests during unrestricted conditions of maximum reservoir and/or forebay head and maximum manufacturer-rated capabilities of the turbines, generators, and other powerhouse components. Based on this approach, Lee Vining has a Dependable Capacity of 10.9 MW.

3.4. PROJECT GENERATION AND OUTFLOW RECORDS

Outflow data and average monthly energy production for current operations of the Project (2018 to 2023) are summarized in Table 3.4-1 and Table 3.4-2, respectively. During this period, annual generation ranged from 13,927 MWh to 35,703 MWh.

Per FERC requirements, a summary of Project generation and outflow records for operations (annually and quarterly) for the 5 years preceding filing the DLA (2018 to 2023) is included in Table 3.4-2.

Table 3.4-1. Average Annual and Monthly MWh Generation (2018–2023)

Year	Jan	Feb	Mar	April	May	June	Jul	Aug	Sept	Oct	Nov	Dec	Annual Total
2018	-22	-20	-24	685	1,163	4,794	7,052	4,211	3,109	1,042	420	577	22,986
2019	671	1,028	440	596	167	7,699	7,728	4,500	2,039	236	-24	957	26,036
2020	1,481	634	750	2,284	3,517	1,773	1,389	534	-6	-18	770	818	13,927
2021	721	781	294	1,529	3,338	2,850	1,017	623	1,168	950	1,481	1,093	15,846
2022	908	792	560	2,265	-24	3,790	1,566	1,362	1,767	684	609	655	14,633
2023	703	669	259	561	5,900	7,724	8,133	5,075	2,280	1,434	1,545	1,419	35,703
2018–2023 Average (MWh)	745	647	380	1,320	2,343	4,721	4,481	2,718	1,726	721	800	920	21,522

MWh = megawatt-hour
A negative value indicates that the market conditions were in "negative pricing" and therefore the Project is consuming rather than producing power.

Table 3.4-2. Summary of Project Generation and Outflows (2018–2023)

<table>
<tr><th>Year</th><th>Quarter</th><th>Average Quarterly Flow (cfs)</th><th>Total Generation (MWh)</th></tr>
<tr><td rowspan="4">2018</td><td>1</td><td>0</td><td>-67</td></tr>
<tr><td>2</td><td>42.5</td><td>6,641</td></tr>
<tr><td>3</td><td>58.5</td><td>14,373</td></tr>
<tr><td>4</td><td>11.4</td><td>2,039</td></tr>
<tr><td colspan="2">2018 Annual</td><td>Average: 32.3</td><td>Total: 22,986</td></tr>
<tr><td rowspan="4">2019</td><td>1</td><td>12.4</td><td>2,139</td></tr>
<tr><td>2</td><td>44.0</td><td>8,461</td></tr>
<tr><td>3</td><td>63.7</td><td>14,267</td></tr>
<tr><td>4</td><td>8.6</td><td>1,169</td></tr>
<tr><td colspan="2">2019 Annual</td><td>Average:22.4</td><td>Total: 26,036</td></tr>
<tr><td>2020</td><td>1</td><td>20.6</td><td>2,865</td></tr>
</table>

Year	Quarter	Average Quarterly Flow (cfs)	Total Generation (MWh)
	2	49.5	7,574
	3	11.0	1,918
	4	8.7	1,570
2020 Annual		Average: 20.5	Total: 13,927
2021	1	10.9	1,797
	2	37.8	7,717
	3	15.6	2,808
	4	17.6	3,524
2021 Annual		Average: 19.0	Total: 15,846
2022	1	12.8	2,260
	2	27.4	5,731
	3	24.1	4,695
	4	11.6	1,948
2022 Annual		Average: 51.2	Total: 14,633
2023	1	11.1	1,630
	2	68.3	14,186
	3	73.6	15,488

cfs = cubic feet per second; MWh = megawatt-hour

3.5. Existing Environmental Measures

The current and ongoing License Articles related to Project O&M and environmental resources management included in the FERC Order issuing new license, including amendments, are briefly described below.

3.5.1. Minimum Instream Flow Requirements

Existing MIF requirements are outlined in USFS 4(e) Condition No. 4 and summarized in Table 3.5-1.

Table 3.5-1. Minimum Flow Requirements by Location

Location	Water Year Type	Minimum Flow (cfs)	Duration
Below Saddlebag Dam [a]	Wet	14	Year-round
	Normal	9	Year-round
	Dry	6	Year-round

Location	Water Year Type	Minimum Flow (cfs)	Duration
Below Tioga Dam	Wet or Normal	If inflow is <2 cfs, the flow must be equal to the inflow and cannot exceed 2 cfs. If the inflow is >2 cfs, the flow must be 2 cfs until the lake water surface elevation is within 2 feet of the main spillway crest; the flow then changes to greater than 60% of the inflow.	May through September
	Dry	If the inflow is <2 cfs, the flow must be equal to the inflow and cannot exceed 2 cfs. If the inflow is >2 cfs, the flow must be 2 cfs until the lake water surface elevation is within 2 feet of the main spillway crest; the flow then changes to the natural inflow.	May through September
	All	2 cfs or the natural inflow	October and November
	All	Equal to the natural flow	December through April
Below Poole Powerhouse [b]	All	27 cfs or the natural flow, whichever is less	August through May
	All	89 cfs or the natural flow, whichever is less	June and July

cfs = cubic feet per second
[a] Annual consultation with USFS no later than May 1 of each calendar year. If no agreement is reached, minimum flows are as such.
[b] Flows here are measured by acoustic velocity meter.

3.5.2. Reservoir Level Requirements for Recreation

The Project is required by USFS 4(e) Condition No. 6 to maintain stable lake levels at Tioga and Ellery Lakes to allow for recreational usage (Table 3.5-2).

Table 3.5-2. Reservoir Level Requirements

Location	Water Year Type	Lake Elevation and Duration
Tioga Lake [a]	Wet or normal	• As of May 1, when the natural inflow increases to 2 cfs or more, flows from the outlet valve of 2 cfs will continue until the water level of Tioga Lake rises to within 2 feet of the elevation of the top of the spillway. • After that date and through September 30, the water level of Tioga Lake will be maintained within 2 feet of the crest of the spillway. This will be maintained as a continuous, minimum flow below the dam that is not less than 60% of the natural inflow.

Location	Water Year Type	Lake Elevation and Duration
	Dry	• As of May 1, when the natural inflow is 2 cfs or less, outlet flows at Tioga Lake cannot be less than the natural inflow and does not exceed 2 cfs. • When the natural inflow into Tioga Lake is greater than 2 cfs, a continuous flow of 2 cfs will be released from the outlet valve. This will continue until the lake level rises to within 2 feet of the crest of the Tioga Lake Dam spillway or, in very dry years, reaches its peak for the year at some point below that level. • From May 1 through September 30, a continuous flow will be released from the outlet valve equal to the natural inflow into Tioga Lake.
Ellery Lake	Any	• Ellery Lake will be managed to be full (within 2 feet of its spillway elevation) during the annual recreation season (defined as the Friday preceding Memorial Day through the end of September). • Ellery Lake may be drawn down to a level that is more than within 2 feet of the spillway elevation, but only for short periods of time if needed to meet emergency maintenance needs or with prior written approval from USFS.

cfs = cubic feet per second; USFS = U.S. Forest Service
[a] Annual consultation with USFS to occur no later than May 1 of each calendar year. If no agreement is reached, target lake levels are as such.

3.5.3. Erosion Control Plan

USFS 4(e) Condition No. 9 requires development and implementation of an Erosion Control Plan. In general, the Project is not known to have an adverse effect on erosion within Lee Vining Creek. The Erosion Control Plan includes measures for soil stabilization, erosion protection, sediment reduction, and dust control (SCE, 1997a). The plan was developed to provide the basis for the formulation of specific measures, which are addressed on a case-by-case basis with USFS to cover accidental occurrences such as a pipeline rupture.

3.5.4. Spoil Disposal Plan

USFS 4(e) Condition No. 10 requires a Plan for Storage and/or Disposal of Excess Construction/Tunnel Spoils and Slide Material. Measures for spoil disposal are determined on a case-by-case basis, and consultation with USFS occurs as needed for these events (SCE, 1997b). No large-scale tunneling or excavation activities related to the Project are underway or proposed.

3.5.5. Hazardous Substances Plan

USFS 4(e) Condition No. 8 requires the development and implementation of a *Plan for Oil and Hazardous Waste Storage and Spill Prevention and Cleanup* (SCE, 1997c). The plan requires SCE to (1) maintain in the Project Area a cache of spill cleanup equipment suitable for any spill from the Project; (2) periodically inform USFS of the location of the spill cleanup equipment on USFS lands and of the location, type, and quantity of oil and hazardous substances stored in the Project Area; and (3) inform USFS immediately of the nature, time, date, location, and action taken for any spill. Additionally, the plan describes approximate quantities of hazardous materials stored within the Project Area, storage procedures, spill prevention measures, and cleanup measures.

3.5.6. Historic Properties Management Plan

In 1990, SCE developed an HPMP in compliance with NHPA Article 106 (White, 1990) and USFS 4(e) Condition No. 13. The HPMP required archaeological and historic inventory of the Project Area and development of appropriate management measures. Fourteen archaeological sites were identified, along with numerous historic structures and facilities associated with hydroelectric development. Evaluation of these resources, in consultation with the Inyo National Forest and SHPO led to determination that three archaeological sites and one historic structure were eligible for listing on the NRHP. The HPMP developed management strategies to avoid effects to archaeological sites and for a data recovery program at the one site in which effects could not be avoided (White, 1990).

According to SCE's 1990 HPMP, the general management measure for known NRHP eligible sites is avoidance of effect. Most features identified were not being affected by normal Project operations at the time of the 1990 report. Nonetheless, SCE used internal communication to share the vicinities of avoidable NRHP eligible sites by marking "Environmental Sensitivity Areas" on Project maps and providing copies to powerhouse managers. In addition, the SCE's Hydro Generation Department notifies SCE's Environmental Department in advance of any ground-disturbing activities planned in an Environmentally Sensitive Area. Upon investigation, SCE Environmental Affairs Division will initiate consultation with the Inyo National Forest and/or SHPO, if warranted (White, 1990).

3.5.7. Riparian Monitoring Program

USFS 4(e) Condition No. 7 requires development of a monitoring program for riparian conditions in addition to fish and aquatic habitat within the FERC Project Boundary. The program included both vegetation and geomorphic parameters. Surveys were conducted in 1999, 2000, 2001, 2006, 2011, 2016, and 2021 at three sites along Lee Vining Creek.

3.5.8. Threatened, Endangered, and Sensitive Species Plan

The Project has an existing *Threatened, Endangered, and Sensitive Species Management Plan* (SCE, 1997d) as required by USFS 4(e) Condition No. 12. The plan identifies sensitive, threatened, or endangered species known for the region; and covers measures to avoid or mitigate any effects to sensitive, threatened, or endangered species or species proposed for special status as a result of ongoing Project operation and addresses generic measures to cover O&M activities on a case-by-case basis as the activities are identified.

3.5.9. Visual Resource Protection Plan

No new facilities are proposed for construction at the Project, nor are any facilities proposed for modification at this time. The Project has an existing *Plan for the Design* *and Construction of Project Facilities in Order to Preserve or Enhance Visual Quality* (SCE, 1997e), as required by USFS 4(e) Condition No. 11. The plan considers facility configurations and alignments, building materials, color, conservation of vegetation, landscaping, and screening.

3.6. 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.

3.6.1. 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 protects life, property, lifelines, and the environment by ensuring the safety of dams. SCE conducts an annual internal review of the Owner's Dam Safety Program in addition to an external 5-year audit.

3.6.2. DAM INSPECTIONS AND REPORTING

Dam inspections and reporting are conducted for the Project as described in Section 3.6.2.1, *FERC Inspections*, below. The Project dams are unattended facilities. The reservoir level and flows in Lee Vining 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.

3.6.2.1. 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. FERC's most recent Dam Safety Inspection Report was filed on December 14, 2023.

3.6.2.2. Independent Consultant Safety Inspections

An independent consultant under contract with SCE inspects Project dams every 5 years in compliance with 18 CFR Part 12 Subpart D—*Review, Inspection, and Assessment by Independent Consultant.* The Subpart D 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. 18 CFR Part 12 Subpart D inspections took place for the Project in 2023.

3.6.2.3. Dam Safety Surveillance and Monitoring Program

SCE files Dam Safety Surveillance and Monitoring Plans (DSSMPs) and Dam Safety Surveillance and Monitoring Reports (DSSMRs) for Project dams. The 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 7, 2024, SCE filed its 2024 DSSMP and 2023 DSSMR for the Project dams.

3.6.3. Emergency Action Plans

Pursuant to 18 CFR § 12.20(a), SCE maintains an individual EAP for the Project dams 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, as well as define 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 their annual EAP update on April 26, 2024.

3.6.4. 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., powerhouse, switchyard, 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 restricted areas;
    - Trash racks on dam intakes structures; and
    - Boat barriers along dam spillways.

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

4.0 PROPOSED ACTION

The Proposed Action represents SCE's proposal for continued Project O&M under a new license issued by FERC, including new environmental measures and plans.

The current license for the Project expires on January 31, 2027.

Using the No Action described in Section 3.0, *No Action*, as a baseline, this section identifies modifications that would occur to the Project under the Proposed Action, including:

- Modification to the existing FERC Project Boundary; and
- New or modified environmental measures and plans to protect, maintain, avoid, or minimize adverse effects or enhance environmental and cultural resources during routine O&M activities.

4.1. FERC PROJECT BOUNDARY MODIFICATIONS

Pursuant to 18 CFR § 4.41, the FERC Project Boundary must encompass all lands necessary for Project purposes, including Project O&M over the term of the FERC license. SCE has reviewed the existing FERC Project Boundary and identified locations where lands should be added or removed. Results of SCE's review are summarized in the LAND-1 Final Technical Report (included in Volume III of this DLA). Proposed modifications include the following:

- Encompassing all lands necessary for Project O&M activities;
- Removal of areas that are not necessary for O&M activities;
- Slight adjustments where the existing FERC Project Boundary imperfectly captures the Project activity or facility (e.g., alignment with current Lee Vining Creek centerline); and
- Correction of mapping errors arising from updated spatial data and tools.

SCE's proposed FERC Project Boundary modifications described above would result in the land ownership within the FERC Project Boundary as described in Table 6.11-8 (Section 6.11, *Land Use*, of this Exhibit E). Land ownership of all parcels will be verified for the FLA.

4.2. PROJECT FACILITIES

SCE is not proposing changes in Project facilities as part of the new license.

4.3. PROJECT OPERATIONS AND GENERATION

SCE is not proposing changes to generation under the existing license. The Project will continue to be operated in compliance with regulatory requirements, agreements, and water rights to generate power. Operations and generation measures are described more in the proposed Resource Management Plan, which is attached to Appendix E.1, *Protection, Mitigation, and Enhancement Measures* (Volume II of this DLA).

4.4. PROJECT MAINTENANCE

SCE is not proposing changes in Project maintenance as part of the new license. The Proposed Action includes routine maintenance to mechanical and structural elements, such as low-level-outlets, gates, and intakes. To the extent that these maintenance activities may mobilize sediment or have other potential environmental consequences, they are implemented in compliance with existing best management practices and SCE-wide practices. Proposed O&M activities are described in detail in the proposed Lee Vining Resource Management Plan (see Appendix E.1, *Protection, Mitigation, and Enhancement Measures*, in Volume II of this DLA).

4.5. NEW OR MODIFIED ENVIRONMENTAL MEASURES, MANAGEMENT AND MONITORING PLANS, AND PROGRAMS

Table 4.5-1 summarizes environmental measures and plans that will be implemented under the Proposed Action. These measures and plans are designed to protect, maintain, or enhance environmental and cultural resources of the term of the new license. SCE is proposing several modifications to existing management plans and some additional or new environmental measures, management or plans or monitoring programs. Appendix E.1, *Protection, Mitigation, and Enhancement Measures*, of this DLA (Volume II) provides additional information regarding each of these proposed measures.

Table 4.5-1. Summary of Environmental Measures and Plans Under the Proposed Action

Measure Number / Plan Title	Resource Area
PME-1 MIF Requirements	Water
PME-2 Reservoir Level Requirements	Water and Recreation
PME-3 Fish Stocking in Ellery Lake	Fish and Aquatics
PME-4 Resource Management Plan	Operations and Maintenance, Botanical, Wildlife, Rare, Threatened and Endangered species, Aesthetics
PME-5 Historic Properties Management Plan	Cultural and Tribal
Wildfire Mitigation Plan	Botanical
Avian Protection Plan	Wildlife
Nesting Bird Guidance for Small Projects	Wildlife
Spoils Disposal Plan	Operations and Maintenance
Erosion Control Plan	Operations and Maintenance
Hazardous Substances Plan	Operations and Maintenance
Invasive Mussel Prevention Plan	Aquatic
Vegetation Management Program Guide	Botanical

MIF = minimum instream flow; PME = protection, mitigation, and enhancement

5.0 OTHER ALTERNATIVES

5.1. Alternatives Considered but Eliminated from Detailed Study

5.1.1. Federal Government Takeover

SCE does not consider federal takeover to be a reasonable alternative. 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 evidence to indicate that federal takeover should be recommended to Congress. No party has suggested that federal takeover would be appropriate, and no federal agency has expressed an interest in operating the Project.

5.1.2. Issuing a Non-Power License

A non-power license is a temporary license that FERC will terminate when it determines that another governmental agency will assume regulatory authority and supervision over the lands and facilities covered under the non-power license. At this point, no agency has suggested a willingness or ability to do so. No party has sought a non-power license, and SCE has no basis for concluding that the Project should no longer be used. Thus, SCE does not consider issuing a non-power license a realistic alternative to relicensing in this circumstance.

5.1.3. Retirement of the Project

Project retirement could be accomplished with or without dam removal. Either alternative would involve denial of the relicense application and surrender or termination of the existing license with appropriate conditions. 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. As such, there is no reason to include decommissioning as a reasonable alternative to be evaluated and studied. The Project provides a viable, safe, and clean renewable source of power to the region and if decommissioned, the Project would no longer be authorized to generate power.

As of this DLA, no party has suggested that Project decommissioning would be appropriate.

6.0 ENVIRONMENTAL ANALYSIS

6.1. INTRODUCTION

SCE began early engagement with Stakeholders, agencies, and interested parties in October 2020 and formed TWGs shortly after. The intent of this early outreach and the TWGs was to identify potential resource issues or potential Project-related effects resulting from Project O&M to analyze and study as part of the relicensing effort. TWGs resulted in study requests from Stakeholders to address questions regarding potential effects to resources. Potential issues identified by Stakeholders, the Study Plans developed to address them, and the DLA section where that issue is discussed are identified in Table 6.1-1.

The following resource sections examine the affected environment of the Project Area, those potential issues identified above, and any protection, mitigation, and enhancement (PME) measures proposed to avoid or minimize potential effects. Unless otherwise noted in each resource section, the Project Area includes the FERC Project Boundary, as described in Section 3.2, *FERC Project Boundary*, and shown in Figure 1-1.

Table 6.1-1. Potential Issues Identified by Technical Working Groups for the Project

Resource Area	Potential Issue	Study Title	Location in DLA, Exhibit E
Geology and Soils	Project O&M have the potential to affect channel morphology and fluvial processes	Lower Lee Vining Creek Channel Morphology (AQ-6)	Section 6.3.2.1, *Effects of Project Operations and Maintenance on Channel Morphology and Fluvial Processes*
Water and Aquatic Resources	Effects of continued Project operation and facilities on water quality in Project reservoirs and Project-affected stream reaches	Stream and Reservoir Water Quality (WQ-1)	Section 6.4.2.1, *Effects of Project Operations and Maintenance on Water Quality in Project Reservoirs and Project-affected Stream Reaches*
Water and Aquatic Resources	Project reservoirs have the potential to methylate mercury that can bioaccumulate in fish and pose health risks to humans that consume them	Stream and Reservoir Water Quality (WQ-1)	Section 6.4.2.2, *Bioaccumulation of Mercury in Fish Tissue and Potential Consumption Guidelines to Avoid Human Health Risks in Project Reservoirs*
Fish and Aquatic Resources	Project operations have the potential to affect quantity and quality of aquatic habitat for fish populations within Project-affected stream reaches	Aquatic Habitat Mapping and Sediment Characterization (AQ-3)	Section 6.5.2.1, *Effects of Project Operations on Quantity and Quality of Aquatic Habitat for Fish Populations within Project-Affected Stream Reaches*
Fish and Aquatic Resources	Project operations have the potential to affect populations of invasive aquatic algae in Project-affected stream reaches	Stream Fish Populations (AQ-2)	Section 6.5.2.2, *Effects of Project Operations on Populations of Invasive Aquatic Algae in Project-Affected Stream Reaches*
Fish and Aquatic Resources	Project operations have the potential to affect the condition of recreational fisheries within Project reservoirs	Reservoir Fish Populations (AQ-1)	Section 6.5.2.3, *Effects of Project Operations on the Condition of Recreational Fisheries within Project Reservoirs*
Fish and Aquatic Resources	Project operations have the potential to affect benthic macroinvertebrate communities, which are often used as indicators of water quality and overall aquatic ecosystem health	Aquatic Habitat Mapping and Sediment Characterization (AQ-3)	Section 6.5.2.4, *Effects of Project Operations on Benthic Macroinvertebrate Communities, Indicators of Water Quality and Overall Aquatic Ecosystem Health*
Terrestrial Wildlife Resources	Project O&M have the potential to affect terrestrial wildlife resources	General Wildlife Resources Survey (TERR-2)	Section 6.6.2.1, *Effects of Project Operations and Maintenance on Terrestrial Wildlife Resources*
Terrestrial Wildlife Resources	Dispersed-use recreational activities have the potential to affect terrestrial wildlife resources	General Wildlife Resources Survey (TERR-2)	Section 6.6.2.2, *Effects of Dispersed-Use Recreational Activities on Terrestrial Wildlife Resources*

Resource Area	Potential Issue	Study Title	Location in DLA, Exhibit E
Terrestrial Wildlife Resources	Project O&M have the potential to affect migratory birds and raptors	General Wildlife Resources Survey (TERR-2)	Section 6.6.2.3, *Effects of Project Operations and Maintenance on Migratory Birds and Raptors*
Botanical Resources	Continued Project O&M has the potential to affect vegetation communities within the Project Area	General Botanical Resources Survey (TERR-1)	Section 6.7.2.1, *Effects of Continued Project Operations and Maintenance on Vegetation Communities Within the Project Area*
Botanical Resources	Continued Project O&M has the potential to affect special-status plant species within the Project Area	General Botanical Resources Survey (TERR-1)	Section 6.7.2.2, *Effects of Continued Project Operations and Maintenance Activities on Special-Status Plant Species Within the Project Area*
Botanical Resources	Continued Project O&M has the potential to affect NNIPs within the Project Area	General Botanical Resources Survey (TERR-1)	Section 6.7.2.3, *Effects of Continued Project Operations and Maintenance Activities on Non-Native Invasive Plants Within the Project Area*
Wetland, Riparian, and Littoral Resources	Project O&M have the potential to affect wetland, riparian, and littoral resources	General Botanical Resources Survey (TERR-1)	Section 6.8.2.1, *Effects of Project Operations and Maintenance on Wetland, Riparian, and Littoral Resources*
Rare, Threatened, and Endangered Species	Project O&M have the potential to affect RTE plant resources within the Project Area	General Botanical Resources Survey (TERR-1)	Section 6.9.2.1, *Effects of Project Operations and Maintenance on Rare, Threatened, and Endangered Plant Resources Within the Project Area*
Rare, Threatened, and Endangered Species	Project O&M activities have the potential to affect threatened and endangered terrestrial wildlife resources	General Wildlife Resources Survey (TERR-2)	Section 6.9.2.2, *Effects of Project Operations and Maintenance Activities on Threatened and Endangered Terrestrial Wildlife Resources*
Rare, Threatened, and Endangered Species	Dispersed-use recreational activities have the potential to affect Yosemite toad and habitat	General Wildlife Resources Survey (TERR-2)	Section 6.9.2.3, E*ffects of Dispersed-Use Recreational Activities on Yosemite Toad and Habitat*
Rare, Threatened, and Endangered Species	Project O&M activities have the potential to affect Sierra Nevada bighorn Sheep and habitat	General Wildlife Resources Survey (TERR-2)	Section 6.9.2.4, *Effects of Project Operations and Maintenance Activities on Bighorn Sheep and Habitat*

Resource Area	Potential Issue	Study Title	Location in DLA, Exhibit E
Recreation	Project O&M activities have the potential to affect recreation use in the Project Area	Recreation Use Assessment (REC-1)	Section 6.10.1.1, *Recreation in the Project Area* [a]
Recreation	Project O&M activities have the potential to affect recreation use in the Project Area	Existing Recreation Facilities Condition Assessment (REC-2)	Section 6.10.1.2, *Recreation Facilities Assessment* [a]
Land Use	Evaluation of the accuracy of the existing FERC Project Boundary and whether lands should be added or removed from the FERC Project Boundary	Project Lands and Roads (LAND-1)	Section 6.11.2.1, *Evaluation of the Accuracy of the Existing FERC Project Boundary and Whether Lands Should be Added or Removed from the FERC Project Boundary*
Aesthetic Resources	Project O&M activities have the potential to affect scenic resources	Visual Resource Assessment (LAND-2)	Section 6.12.3.1, *Effects of Project Operations and Maintenance Activities on Scenic Resources*
Cultural Resources	Project O&M activities could potentially affect cultural and Tribal resources, TCPs, and other resources of traditional, cultural, or religious importance to the Native American community	Cultural Resource (CUL-1)	Section 6.13.8.2, *Current Potential Adverse Effects and Issues on Cultural Resources*
Tribal Resources	Project O&M activities could potentially affect cultural and Tribal resources, TCPs, and other resources of traditional, cultural, or religious importance to the Native American community	Tribal Resource (TRI-1)	Section 6.14.8.2, *Current Potential Adverse Effects and Issues on Tribal Resources*

O&M = operation and maintenance; NNIP = non=native invasive plant; RTE = rare, threatened, and endangered; TCP = Traditional Cultural Property

[a] The REC-1 Study is ongoing as of the filing of this DLA, and there are no FERC-approved recreation facilities associated with the Project. Draft potential effects, if any will be evaluated in the FLA.

6.2. GENERAL DESCRIPTION OF THE RIVER BASIN

The Lee Vining Creek is within the Mono Lake watershed and all water in the Project Vicinity historically flowed into Mono Lake. The Mono Lake watershed (Figure 6.2-1) has a total drainage area of approximately 750 square miles (LADWP, 1987). Roughly half of the Mono Lake watershed is hills and mountains (365 square miles), and the other half is valley fill areas and Mono Lake itself (385 square miles) (LADWP, 1987). Elevations in the watershed range from 6,400 feet above mean sea level (amsl) to over 13,000 feet amsl (LADWP, 1987).

Lee Vining Creek flows southeastward approximately 15 miles from its headwaters just above Saddlebag Lake to Mono Lake east of the town of Lee Vining (SCE, 2020). Glacier Creek (a major tributary to Lee Vining Creek) flows into Tioga Lake northwest of Dana Lake and Mount Dana for approximately 1.83 miles to its confluence with Lee Vining Creek (estimated using Google Earth imagery), which then flows east into Ellery Lake. Lee Vining Creek continues from the outlet of the Rhinedollar Dam and flows generally east and north to the town of Lee Vining and on to Mono Lake. The drainage area of the Project at Rhinedollar Dam is approximately 17 square miles (SCE, 2020). Both Lee Vining Creek and Glacier Creek originate in snowpack from glacially carved terrain in the Sierra Nevada (SCE, 2020 and 2023). Below the Project, several other tributaries contribute to Lee Vining Creek as it flows to Mono Lake, such as Warren Fork, Gibbs Lake/Creek, Mine Creek, and Beartrack Creek.

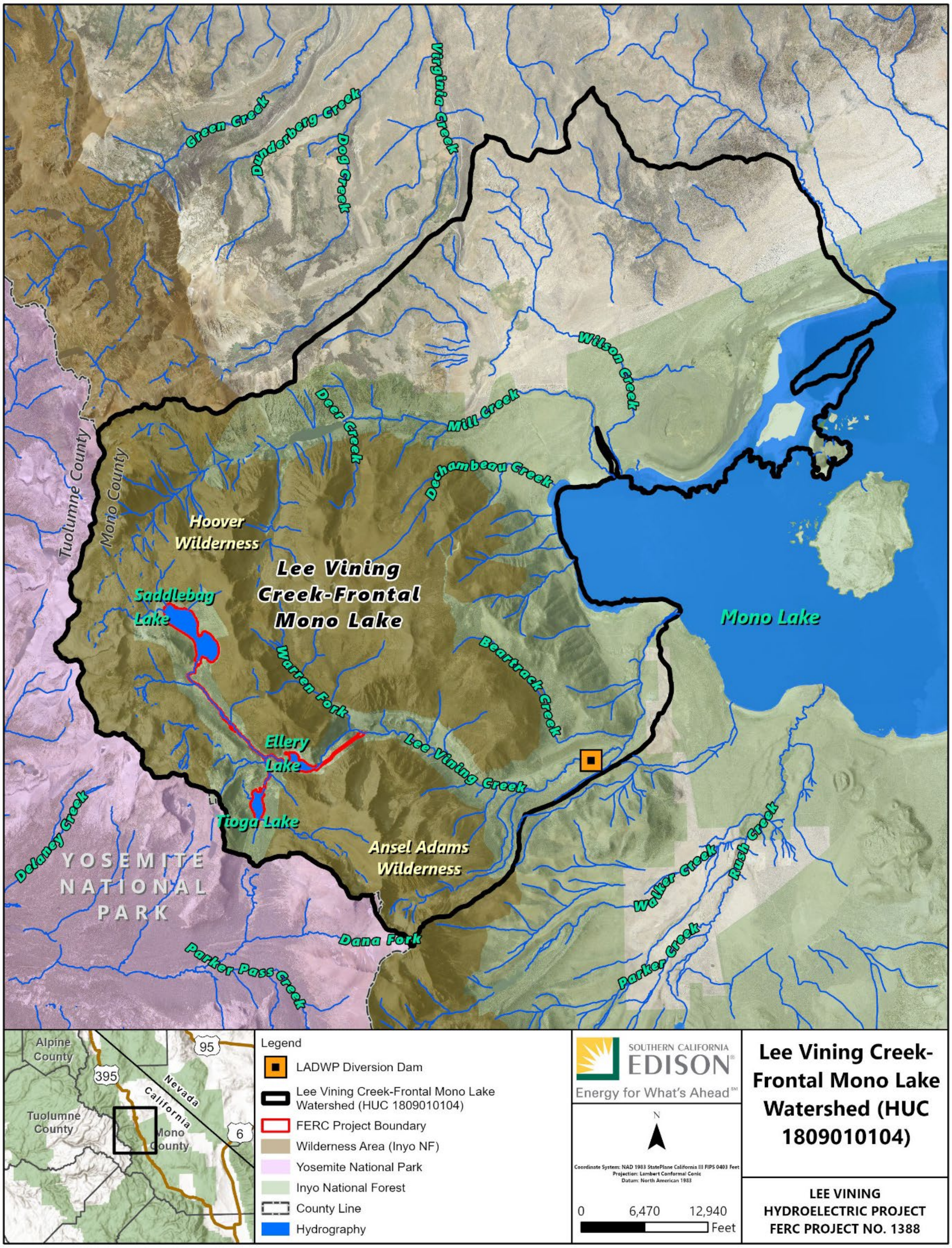


Figure 6.2-1. Lee Vining Creek–Frontal Mono Lake (Hydraulic Unit Code 1809010104).

6.2.1. Topography

The Project Area is characterized by significant topographic relief with elevations ranging from over 13,000 feet to 7,000 feet below amsl (Millar and Woolfenden, 1999; Vorster, 1985).

The uppermost reservoir, Saddlebag Lake, lies within a glacially carved U-shaped valley. Steep, 1,200-foot ridges bound the lake on the east and west sides, and talus slopes form most of the rock shoreline. Saddlebag Dam is in a narrow channel between rock outcrops (FERC, 1992). Tioga Lake lies in a valley on glacial till with a scattering of rounded rock outcrops. The two Tioga dams, comprising a small concrete arch auxiliary dam and a main dam, lie within the rock outcrops (FERC, 1992). Ellery Lake, impounded by Rhinedollar Dam, has a rocky shoreline with several areas of talus slopes entering the lake from the steep terrain along the southern margin.

6.2.2. Climate and Precipitation

Precipitation amounts vary greatly in the Mono Lake watershed. The California Department of Water Resources gage at Ellery Lake (maintained by SCE) has an average annual precipitation of 20.03 inches (CDEC, 2023). Since 2013, the average annual precipitation has been 21.10 inches. There are arctic-like winters in the high mountains and dry, warm summer conditions in Mono Basin (LADWP, 1987). Average air temperature at Ellery Lake is 33 degrees Fahrenheit (°F), and 26 °F at Dana Meadows (CDEC, 2023).

The town of Lee Vining has an average annual high temperature of 61 °F, an average annual low temperature of 35 °F, and receives an average of 15.67 inches of precipitation annually (U.S. Climate Data, 2023).

6.2.3. Major Land Uses

A more detailed discussion of land use can be found in Section 6.11, *Land Use*.

The Project is located primarily on federal land within the Inyo National Forest. The nearest community is the unincorporated town of Lee Vining, approximately 5.25 miles east of the Poole Powerhouse.

The surrounding area has almost no development aside from the roads in the Project Vicinity. Based on 2021 data from the National Land Cover Database (NLCD), the predominant land cover types in the Lee Vining Creek–Frontal Mono Lake subwatershed are as follows (MRLC Consortium, 2021) (see Figure 6.11-2 and Table 6.11-2 in Section 6.11, *Land Use*):

- Evergreen forest
- Shrub/scrub
- Barren

- Grassland/herbaceous
- Open water
- Perennial ice/snow
- Emergent herbaceous wetlands
- Woody wetlands
- Developed open/low/medium intensity

The Inyo National Forest LMP (USFS, 2019) manages the forest for a variety of land uses, including recreation, wilderness use, maintenance and improvement of habitat, rangeland, timber production, and the exploration and development of mineral resources, particularly energy resources. Land use in the immediate area otherwise consists of recreational uses such as hiking, camping, fishing, and sightseeing.

The Inyo National Forest LMP (USFS, 2019) identifies the Project Area as being included in the plan's conservation watershed management area, specifically under the Mono Lake Headwaters designation. Conservation watershed management areas are a network of watersheds that: (1) have been determined to have a functioning or functioning-at-risk rating based on the Watershed Condition Framework; (2) provide for connectivity of species of conservation concern; and (3) provide high quality water for beneficial uses downstream. The management emphasis for conservation watersheds is to maintain or improve, where possible, the functional rating of these systems for the long-term and to provide for the persistence of species of conservation concern by maintaining connectivity and refugia for these species.

6.2.4. Major Water Uses

The primary uses of water within the Lee Vining Creek watershed are power generation by SCE and recreation such as fishing and boating. Downstream of the Project, much of the flow is diverted by LADWP (FERC, 1992). As described in Section 6.4, *Water Resources*, the allocation of water between LADWP and Mono Lake is now governed by minimum flow requirements in Lee Vining Creek regulated by the SWRCB.

Water resources are discussed in Section 6.4; recreation is discussed in Section 6.10, *Recreation*.

6.2.5. Diversion Structures

There are two dams on Lee Vining Creek (Saddlebag Dam and Rhinedollar Dam) and two dams on Glacier Creek (Tioga Dam and Tioga Auxiliary Dam) associated with the Project. A description of each is provided in Exhibit A of this License Application.

One other dam, owned and operated by the LADWP, is located on Lee Vining Creek, approximately 5 miles downstream of the Poole Powerhouse: the LADWP Diversion Dam.

There, the water is diverted to the Los Angeles Aqueduct System via the Lee Vining Conduit (LADWP, 1987). LADWP has been diverting water from Lee Vining Creek at this location since 1941 (LADWP, 1987).

No other diversions or hydropower projects are located on Lee Vining Creek or its tributaries.

6.2.6. Scope of Cumulative Effects Analysis

According to the Council on Environmental Quality regulations for implementing National Environmental Policy Act (NEPA) (40 CFR § 1508.7), a cumulative effect is an effect on the environment that results from the incremental effect 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 time, including hydropower and other land and water development activities.

Cumulative effects will be fully described in the FLA.

6.3. GEOLOGY AND SOILS

This section describes geology and soils within and in the Project Vicinity. The discussion provided here is intended to inform an evaluation of potential issues relating to the Proposed Action and how the completed studies inform the understanding of Project effects.

6.3.1. AFFECTED ENVIRONMENT

The Project is located in the Cascade-Sierra Mountains physiographic province (Figure 6.3-1). Mono Lake, east of the Project Area, is situated in the Basin and Range physiographic province. The region has a rich tectonic, volcanic, and glacial history. The Project Area was sculpted by glaciers and is characterized by rounded granite outcrops, U-shaped valleys, glacial lakes within glacial till deposits, and talus slopes as shown on Figure 6.3-2 (FERC, 1992). Within Mono Basin, elevations range from over 13,000 feet amsl along the Sierra Nevada peaks to approximately 6,400 feet at the shoreline of Mono Lake (Millar and Woolfenden, 1999), with the basin floor generally below 7,000 feet (Vorster, 1985).

Saddlebag Lake, Tioga Lake, and Ellery Lake lie within glacially carved valleys with talus slopes on the rocky shorelines (FERC, 1992). Steep, 1,200-foot ridges bound the lake on the east and west sides, and talus slopes form most of the rock shoreline. The uppermost reservoir, Saddlebag Lake, lies within a glacially carved U-shaped valley. The area is characterized by significant topographic relief with elevations ranging from over 13,000 feet to 7,000 feet below mean sea level (Millar and Woolfenden, 1999; Vorster, 1985). Saddlebag Dam is in a narrow channel between rock outcrops (FERC, 1992). Tioga Lake lies in a valley on glacial till with a scattering of rounded rock outcrops. Tioga Dam, comprising a small concrete arch dam and a main dam, lies within the rock outcrops (FERC, 1992). Ellery Lake, impounded by Rhinedollar Dam, has a rocky shoreline with several areas of talus slopes entering the lake from the steep terrain along the southern margin. Rhinedollar Dam is anchored in rock at the left abutment, whereas the right abutment is within a talus slope (FERC, 1992).

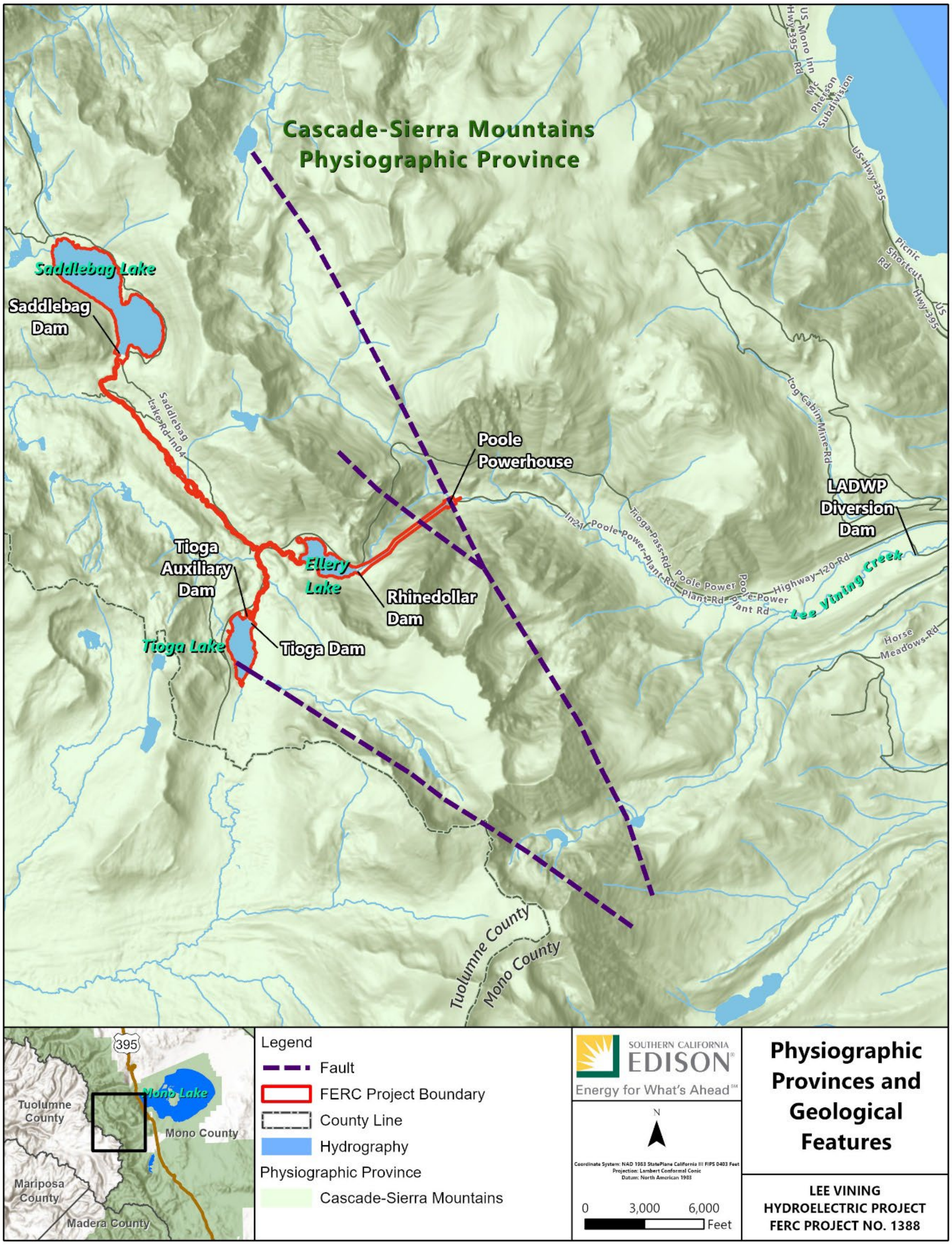


Figure 6.3-1. Physiographic Provinces and Geological Features.

The Project is primarily in the Western Metamorphic Rocks group, including metasedimentary rock (Late Paleozoic) and metavolcanic rock (Triassic, Jurassic, Cretaceous), with surficial deposits including Holocene talus and alluvium (Huber et al., 1989). The Scheelite Intrusive Suite, one of the largest Mesozoic intrusive suites in the Sierra Nevada, also lies within the Project Area and includes the granite of Lee Vining Canyon (Bateman, 1992; Barth et al., 2011). Within the Project Area, metamorphosed volcanic rocks unconformably overlie Paleozoic metasediments (Barth et al., 2011), which include volcanic sandstone, thinly bedded calc-silicate rock, and thin interbeds of ash-flow tuff. The Saddlebag Lake Pendant includes all rocks that stratigraphically overlie the Scheelite Intrusive Suite. The pendant exposes rocks of both the Sonoma and Antler orogenic belts from west-central Nevada, which date to the Paleozoic Era (Schweickert and Lahren, 1987). Rocks within the Antler orogenic belt typically include chert, shale, siltstone, and argillite with minor lenses of quartzite, calcarenite, and basalt. Rocks of the Sonoma orogenic belt typically include metagabbro and other ultramafic rocks, chert-argillite breccia, siltstone, sandstone, and conglomerate (Lahren, 1989).

6.3.1.1. Mineral Resources

There is history of gold, silver, and tungsten mining in the Lee Vining Creek watershed (Bateman, 1965); however, the USGS Mineral Resources Data System does not provide detailed information about the current status of these historical mines (USGS, 2018).

6.3.1.2. Soils

Soils within and surrounding the FERC Project Boundary are generally thin as shown on Figure 6.3-2. At high elevations, soil development has been limited by the harsh climate and recent glaciations that left behind steep bedrock and colluvium-covered slopes (Vorster, 1985). Soils within and surrounding the FERC Project Boundary are generally described as coarse-textured, well-drained, and low in organic matter (Vaughn, 1983). Within the FERC Project Boundary, a sparse, thin soil stabilized by grasses has formed along the northern portion of Saddlebag Lake. At Tioga Lake, thin soils have developed over the bedrock and till. Soils are undeveloped along a portion of the perimeter of Ellery Lake (FERC, 1992). Saline-alkaline soils with high water tables and salt crusts occur downstream at Mono Lake outside of the FERC Project Boundary (Vorster, 1985).

Soils are generally thin within the Project Vicinity. At high elevations, soil development has been limited by the harsh climate and recent glaciations that left behind steep bedrock and colluvium-covered slopes (Vorster, 1985). Soils in the Project Vicinity are generally described as coarse-textured, well-drained, and low in organic matter (Vaughn, 1983). Within the Project Area, a sparse, thin soil stabilized by grasses has formed along the northern portion of Saddlebag Lake. At Tioga Lake, thin soils have developed over the bedrock and till. Soils are undeveloped along a portion of the perimeter of Ellery Lake (FERC, 1992). Downstream at Mono Lake outside of the Project Area, saline-alkaline soils with high water tables and salt crusts occur (Vorster, 1985).

The soil units in the Project Vicinity are shown on Figure 6.3-2 and include the following U.S. Department of Agriculture National Cooperative Soil Survey data units mapped by the University of California Davis and University of California Agriculture and National Resources (USDA, 2020):

- “Rock outcrop-Rubble land complex” [117], which comprises 60 percent rock outcrop and 20 percent rubble land. This unit extends around most of the perimeter of Saddlebag Lake and along the northeastern slope above Lee Vining Creek to the outlet of Ellery Lake and between Ellery and Tioga Lakes and west of Tioga Lake.

- “Rock outcrop-Rubble land-Canisrocks association, 0 to 80 percent slopes,” cirqued mountainflanks, cryic [219yp], which comprises 40 percent rock outcrop, 25 percent rubble land, 15 percent Canisrocks, 10 percent lithic Cryorthents, 7 percent Humic Lithic Dystrocryepts, 2 percent water, and 1 percent Histosols. Canisrocks are of the Entisols order. This unit extends along the western and southern slopes above Saddlebag Lake and Lee Vining Creek.

- “Stecum-Charcol families-Rock outcrop complex, 30 to 70 percent slopes” [158]. This unit comprises 35 percent Stecum family, 25 percent Charcol family, 15 percent rock outcrop, 10 percent lithic Cryorthents, 10 percent Aquic Cryoborolls, and 5 percent unnamed. The Stecum family is of the Entisols order and the Charcol family is of the Mollisols order. This unit encompasses Lee Vining Creek and its margins from Saddlebag Lake to Ellery Lake.

- “Stecum-Guiser families-Rock outcrop complex, 15 to 60 percent slopes” [157]. This unit comprises 40 percent Stecum family, 20 percent Guiser family, 15 percent rock outcrop, 10 percent lithic Cryorthents, 5 percent Aquic Cryoborolls, 5 percent Charcol family, 5 percent Cowood family. The Guiser family is of the Alfisols order. This unit extends around the eastern and southern margins of Tioga Lake.

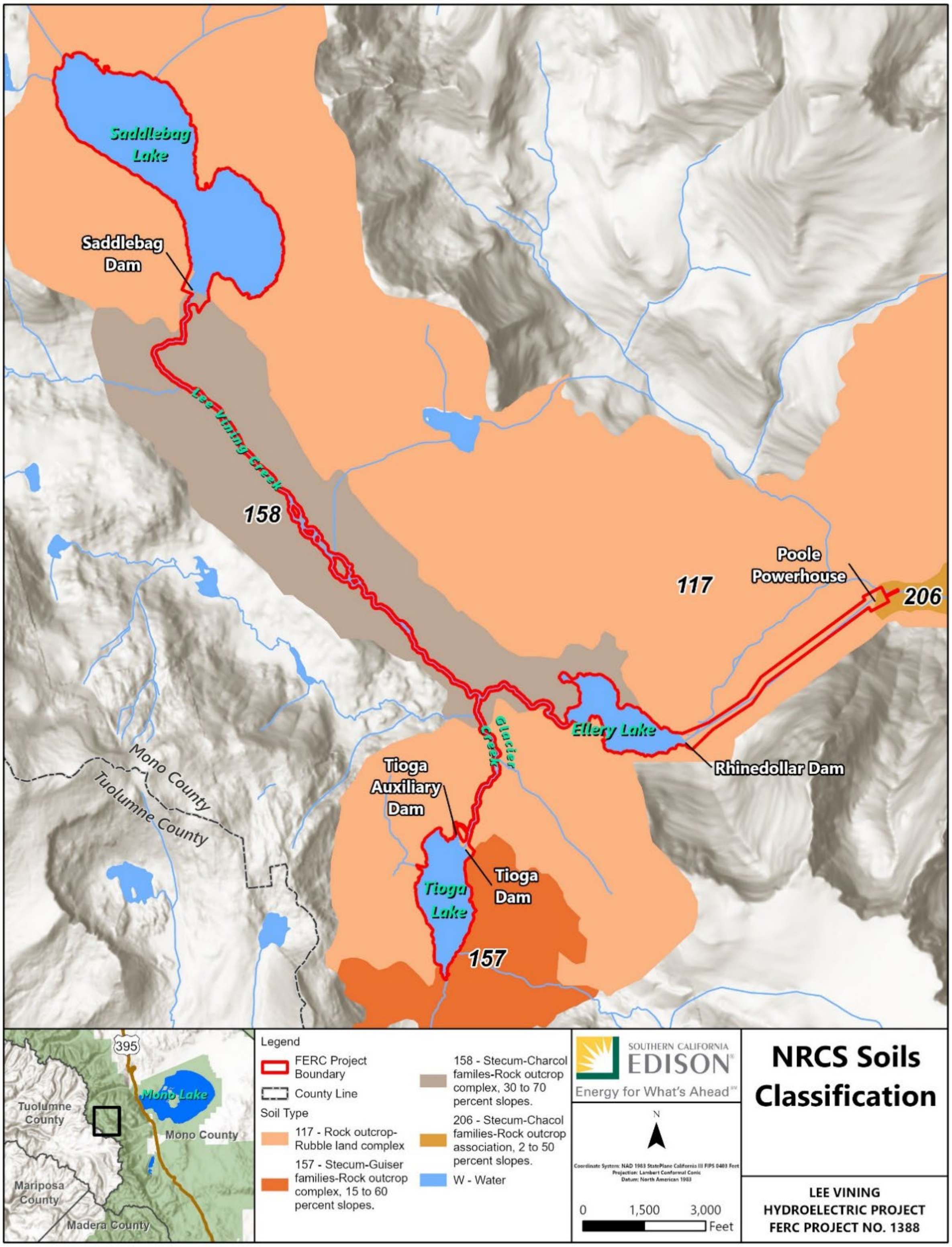


Figure 6.3-2. NRCS Soils Classifications.

6.3.1.3. Tectonic History

The Sierra Nevada frontal fault zone extends approximately 373 miles (600 kilometers) along the eastern escarpment of the Sierra Nevada from near the Garlock fault to the Oregon Cascade Range and defines the western boundary of the Eastern California Shear Zone and Basin and Range physiographic province. Surrounding the FERC Project Boundary, the Sierra Nevada frontal fault zone occurs as a series of left-stepping, north-north-west striking, and east-facing escarpments formed in Quaternary alluvial deposits (alluvial fan and glacial deposits) and rockslides (Le et al., 2007). The Sierra Nevada frontal fault zone has remained tectonically active throughout the Quaternary. Since 1978, earthquakes have been concentrated in a portion of the Eastern California Shear Zone referred to as the Walker Lane Belt.

6.3.1.4. Glacial Features

The Sierra Nevada eastern escarpment is characterized by steep, granitic mountain slopes. Most sedimentary rocks in the Mono Basin are not older than the Quaternary (i.e., 2.6 million years ago to present; LADWP, 1987). The Quaternary glacial record on the eastern side of the Sierra Nevada includes eight named Pleistocene glaciations and stadials, in order of decreasing age: McGee (Pliocene-Pleistocene), Sherwin (800 thousand years ago [ka]), Casa Diablo, Mono Basin, Tahoe (150 ka), Tenaya, Tioga (Late Wisconsin to Last Glacial Maximum), and Recess Peak (14 to 12.5 ka), as well as the Neoglacial Matthes (Little Ice Age) advance; although there is evidence of several more (unnamed) advances and retreats (Gillespie and Zehfuss, 2004; Gillespie and Clark, 2011). During the Last Glacial Maximum (21 to 18 ka maximum), the Sierra Nevada in California was covered by a 20,000-square-kilometer glacier ice cap complex (Phillips, 2017). Glacial debris from multiple Pleistocene glaciations formed many moraines, ridges, and coarse-grained alluvial deposits that cover a broad piedmont slope of glacial till at the base of the Sierra Nevada, as well as sculpting depressions that are now alpine lakes (Jones & Stokes Associates, 1993). Several terminal and lateral glacial moraines are present along the Sierra Nevada escarpment between Bishop and Lee Vining (Vaughn, 1983). Aeolian erosion and redeposition, rockfalls, small debris flows, and slides shape the slopes of the moraines; the Mono Basin moraines are covered with grus (angular, coarse-grained fragments of crystalline rock), which suggests that as these processes become less active. In addition, creep is the primary means of moraine degradation (Bursik, 1991).

The three reservoirs within the FERC Project Boundary (Saddlebag, Tioga, Ellery) were glacially scoured natural lakes prior to dam construction for hydropower storage in the 1920s (Jones & Stokes Associates, 1993). Today, there are two extant glaciers in the Lee Vining Creek watershed—the Conness Glacier and the Dana Glacier—as well as several rock glaciers. The extent to which natural ice processes currently contribute to erosion in the FERC Project Boundary is unknown.

6.3.1.5. Reservoir Shoreline and Streambank Conditions

Bathymetry of Project reservoirs is shown on Figures 6.3-3 to 6.3-5. The occurrence and potential for shoreline erosion around the perimeter of Saddlebag Lake, Tioga Lake, and Ellery Lake was assessed using Unmanned Aircraft Systems imagery (CASC Engineering and Consulting, 2020) and aerial photography available on Google Earth. Shoreline conditions at each lake are described below.

Variable water levels within Saddlebag Lake create a ring of predominantly unvegetated rock and soil surrounding the reservoir. Reservoir shorelines are typically underlain by bedrock and other resistant materials associated with coarse-grained talus and rockfall. Less frequently occurring areas underlain by finer-grained materials show some terracing from wind wave erosion, particularly along the north shore where slopes are more gradual. Soil has been removed from these areas, but otherwise there is little evidence of active surface erosion, mass wasting, or erosion due to the tractive force of wind waves.

Tioga Lake maintains a more stable water level with highly vegetated shorelines occupied by stable large woody debris (LWD). There were no signs of shoreline retreat in vegetated areas due to wind wave erosion. Shorelines at the southern end of the reservoir near the tributary inlet are underlain by finer-grained materials, but shoreline erosion was not apparent in this area. Surface erosion (e.g., rilling) was observed on the shoulders of Tioga Road along shorelines at the northern end of the lake.

Much like Tioga Lake, Ellery Lake maintains a relatively stable water level that limits wind wave erosion within the zone of fluctuation. Much of the shoreline is underlain by resistant material (e.g., talus, rockfall, coarse-grained alluvial fans, and bedrock). Shorelines are typically highly vegetated at and above the waterline and do not show evidence of wind wave erosion. Highly vegetated islands within the reservoir also show little to no evidence of erosion.

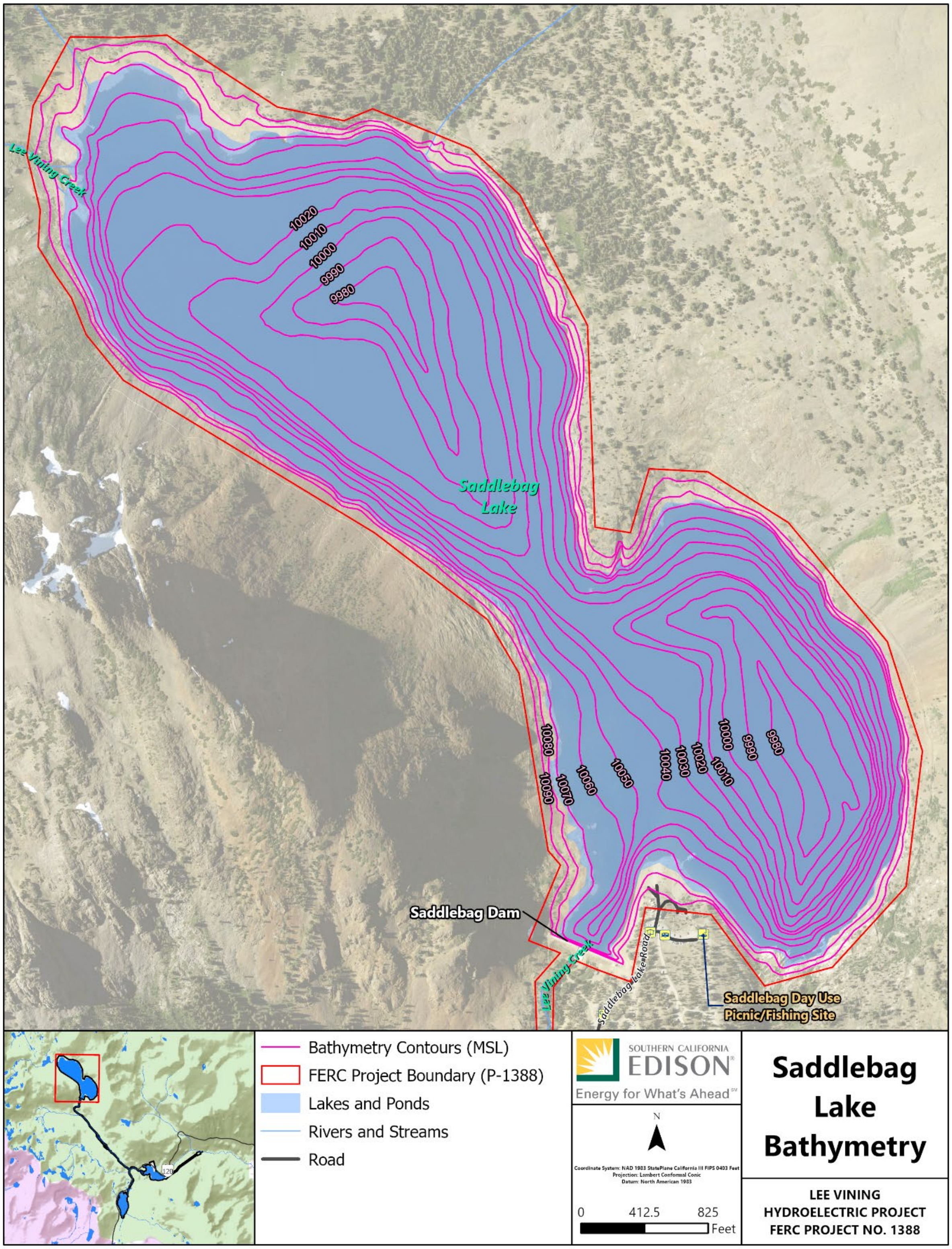


Figure 6.3-3. Bathymetry of Saddlebag Lake.

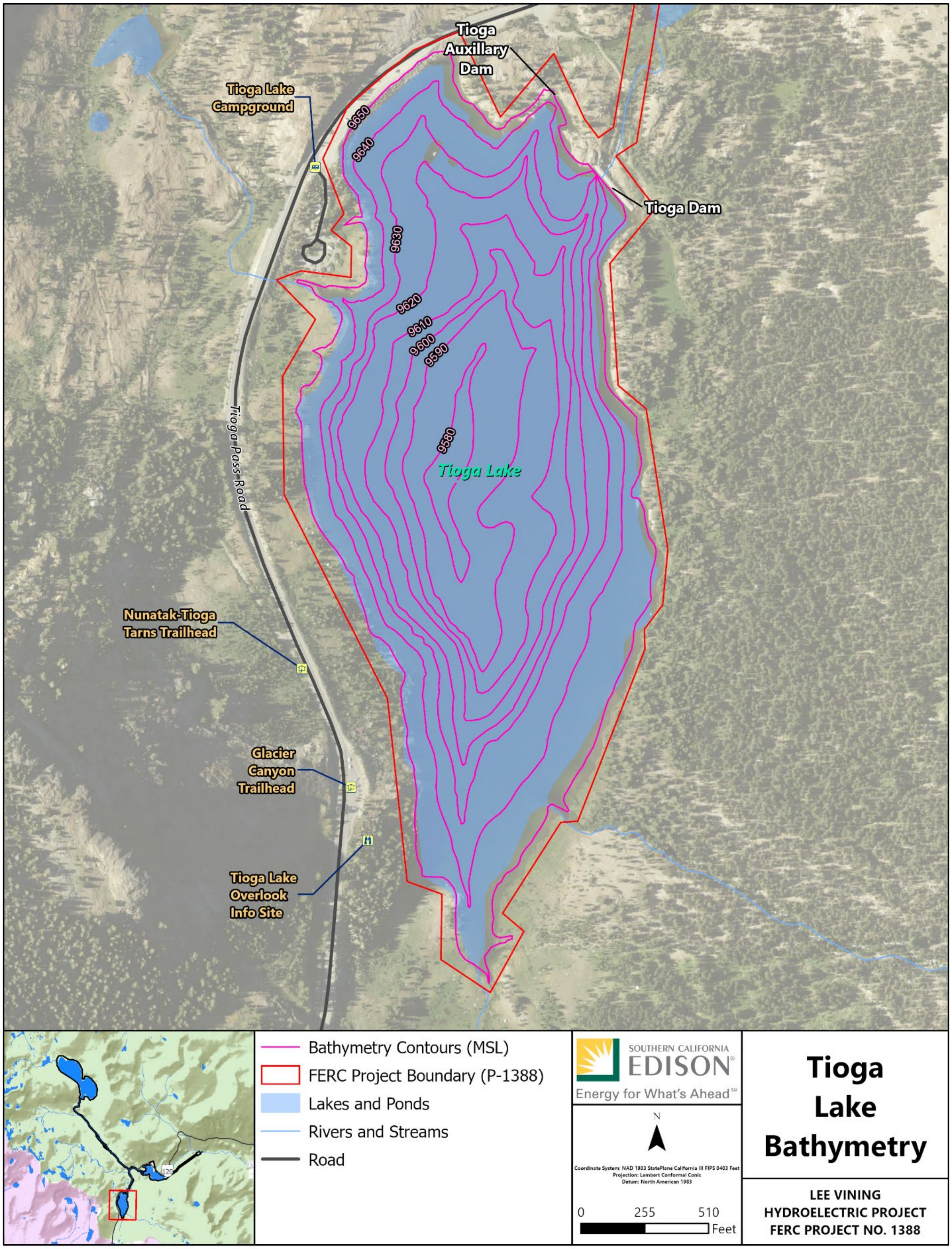


Figure 6.3-4. Bathymetry of Tioga Lake.

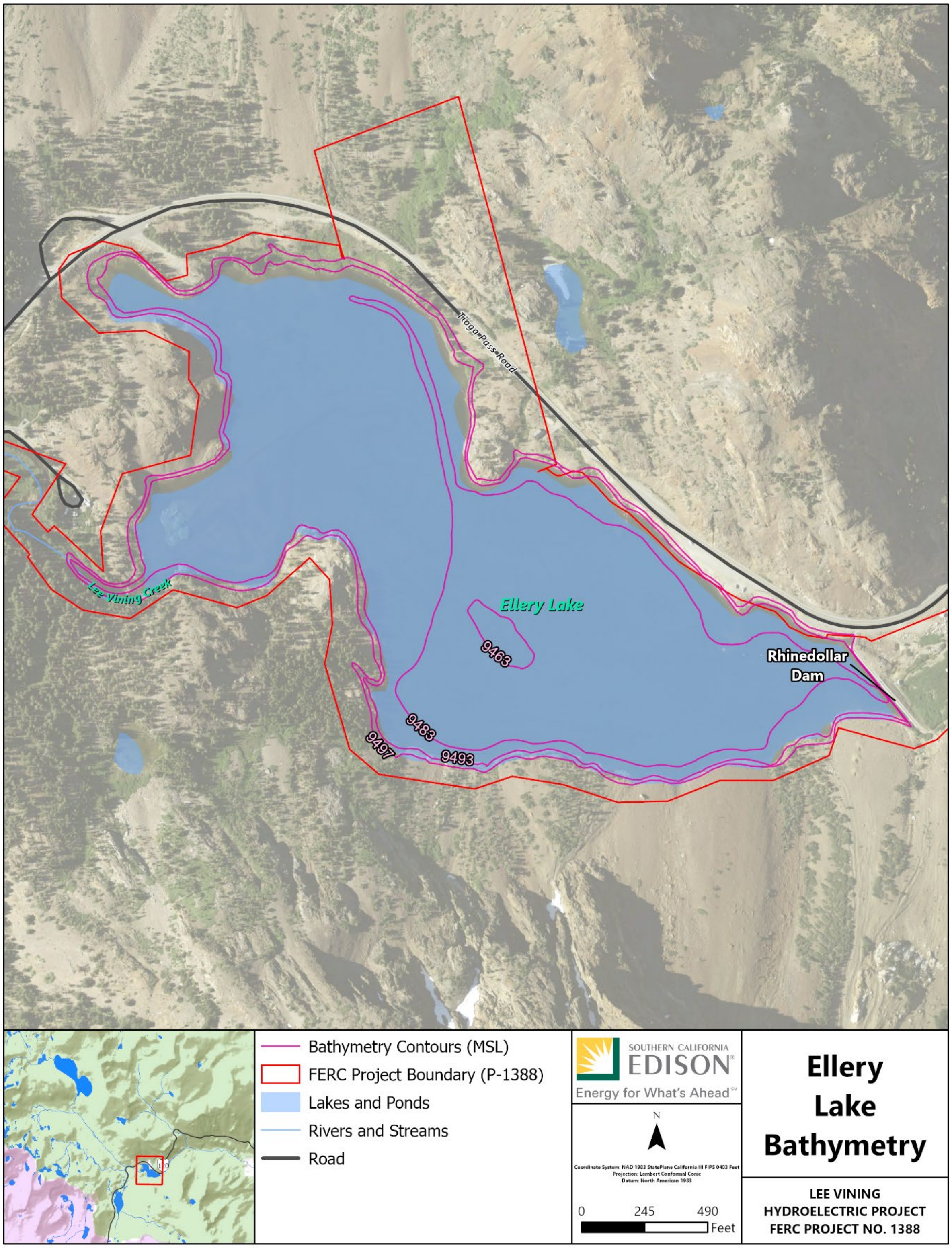


Figure 6.3-5. Bathymetry of Ellery Lake.

Project reservoirs have surface areas spanning from 297 acres in Saddlebag Lake to 61 acres at Ellery Lake. The annual drawdown over winter to support storage during spring run-off produces variable water levels within Saddlebag Lake leading to a ring of predominantly unvegetated rock and soil surrounding the reservoir (Figure 6.3-6). Reservoir shorelines are typically underlain by bedrock and other resistant materials associated with coarse-grained talus and rockfall. Less frequently occurring areas underlain by finer-grained materials show some terracing from wind wave erosion, particularly along the north shore where slopes are more gradual. Soil has been removed from these areas, but otherwise there is little evidence of active surface erosion, mass wasting, or erosion due to the tractive force of wind waves.

Figure 6.3-6. Shoreline Along Lee Vining Creek and Saddlebag Lake.

Tioga Lake maintains highly vegetated shorelines occupied by stable LWD. There were no signs of shoreline retreat in vegetated areas. Shorelines at the southern end of the reservoir near the tributary inlet are underlain by finer-grained materials, but shoreline erosion was not apparent in this area. Surface erosion (e.g., rilling) was observed on the shoulders of Tioga Road along shorelines at the northern end of the lake.

Much like Tioga Lake, Ellery Lake maintains a relatively stable water level that limits wind wave erosion within the zone of fluctuation. Much of the shoreline is underlain by resistant material (e.g., talus, rockfall, coarse-grained alluvial fans, and bedrock). Shorelines are typically highly vegetated at and above the waterline and do not show evidence of wind wave erosion. Highly vegetated islands within the reservoir also show little to no evidence of erosion.

6.3.1.6. Erosion and Sedimentation

The surficial geology of the Project Vicinity is shown on Figure 6.3-7. California Geological Survey (CGS, 2015) has not mapped landslides or other mass movements within the Project Area. Nearby studies (e.g., Wieczorek and Jäger, 1996), along with the need for remediation management of slope failures in the Project Area (SCE, 1997), provide some indication of potential for mass wasting; however, there is no information to reasonably determine the extent that mass wasting or hillslope erosion occur in the Project Vicinity.

As part of the 1992 EA (FERC, 1992) and Condition 9 of the current license (FERC, 1997), an Erosion Control Plan based on site geological, soil, and groundwater conditions was required. The FERC-approved Erosion Control Plan (SCE, 1997) states that because there were no major changes to Project facilities or maintenance, soil erosion would be related to minor construction activities associated with access road repairs, bridge repairs, maintenance of dams and diversion structures, repair of flowlines, replacements and repairs of buildings and facilities, repairs of transmission facilities, and other channel maintenance and facility modifications as required by FERC as a result of periodic inspections. The Erosion Control Plan (SCE, 1997) requires consultation with the USFS in relation to specific erosion control measures, as well as with the Lahontan Regional Water Quality Control Board and California Department of Fish and Wildlife (CDFW) when appropriate.

The following measures required in the Erosion Control Plan (SCE, 1997) to reduce erosion and sedimentation are currently part of ongoing Project O&M.

- Grading and contouring—after ground-disturbing activities and retaining original drainage patterns.
- Construction of erosion control structures—in areas prone to significant flows and/or erosion, structures such as riprap, rock gabions, or small concrete retaining structures may be necessary. Temporary sedimentation basins may be utilized for work within or adjacent to streams, followed by revegetation.
- Water bars, sediment fences etc.—where needed, water bars (earth, concrete, or sandbags) placed at 30 degrees will be used on slopes to dissipate energy of flowing water and reduce soil erosion. Where needed, sediment fences may be used near streams and in areas of high run-off to trap sediments. Straw bales may also be used to reduce sedimentation in and adjacent to streams.
- Slope stabilization—straw and/or jute matting may be used in the stabilization of slopes prior to revegetation and plants establishing.
- Revegetation—revegetation methods and plant palettes are site-specific and would require a revegetation plan and where feasible a revegetation monitoring program. Areas of disturbance may be required to be periodically monitored, and noxious weeds will be eradicated as appropriate.
- Wind erosion—wind erosion may be reduced through revegetation, intermittent use of dust palliative chemicals, lath fences, or earthen berms. Water trucks may be required to be used to control dust during construction.
- Monitoring—the effectiveness of erosion and sedimentation control measures may be required to be monitored during and after storm events. Erosion control structures will be repaired, and erosion damage remediated.

Sediment removal at Project impoundments is conducted on an as-needed basis.

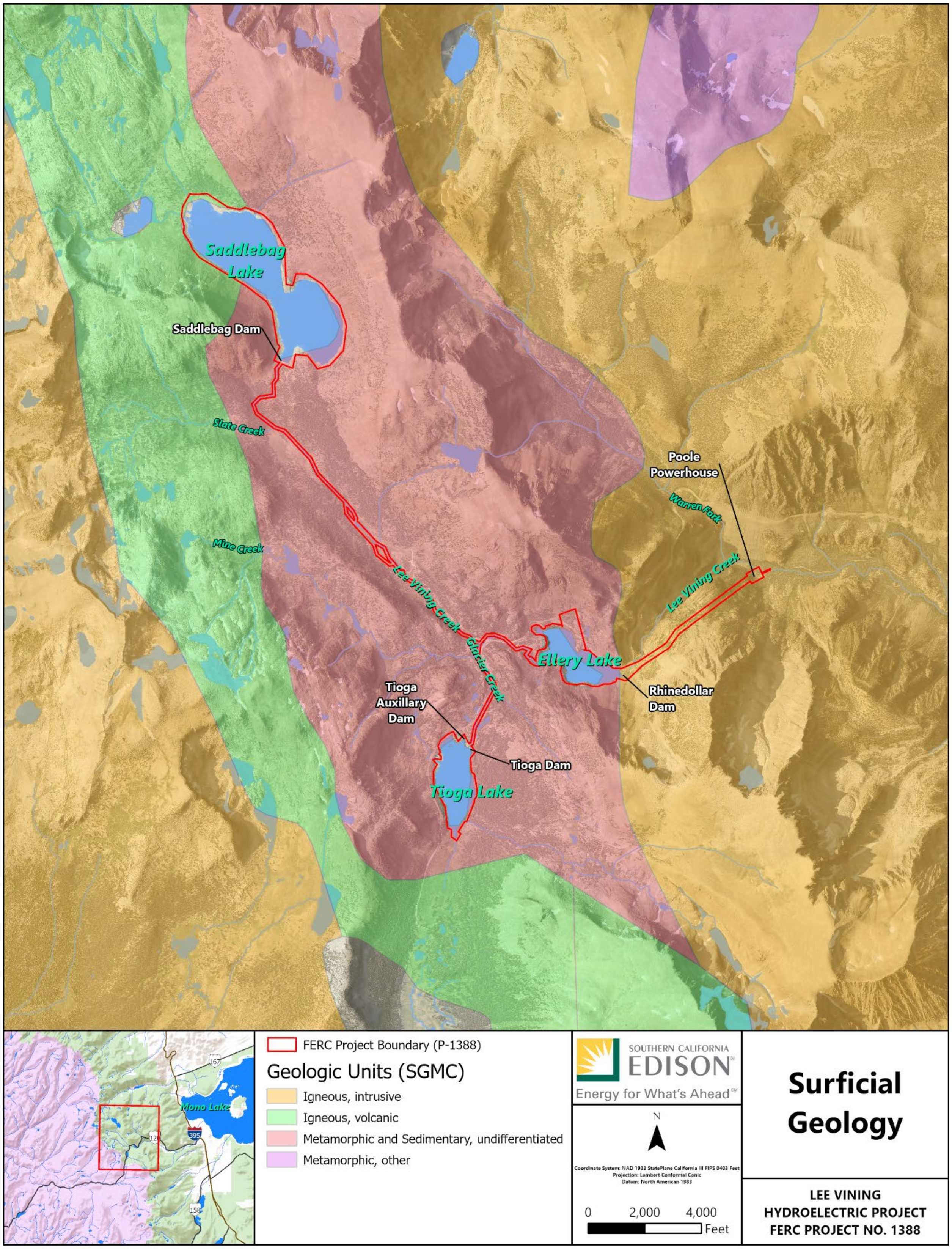


Figure 6.3-7. Surficial Geology.

6.3.1.7. Fluvial Geomorphology

Lee Vining Creek between Saddlebag Dam and Ellery Lake has three distinct stream reaches differentiated by habitat and channel morphology (Figure 6.3-8).

1. Lee Vining Creek from Saddlebag Dam to the confluence of Slate Creek (an unimpaired tributary to Lee Vining Creek)—this reach is 1,258 feet long and as of 1992 reportedly comprised moderate gradient riffles of various widths and a small amount of cascade habitat (approximately 85 percent riffle, approximately 10 percent cascade).

2. Lee Vining Creek from the confluence of Slate Creek to the confluence of Glacier Creek—this reach is 10,750 feet long and as of 1992 reportedly comprised two low-gradient meadow sections, totaling 7,880 feet in stream length, separated by a steeper gradient canyon of 2,870 feet stream length.

3. Lee Vining Creek from the confluence of Glacier Creek to Ellery Lake—this reach is 2,406 feet long, is wide and relatively shallow, and as of 1992 reportedly comprised riffle, run, and cascade habitat with cobble and gravel substrate.

SCE conducts regular riparian and aquatic monitoring as part of the existing license beginning with baseline surveys conducted 1999 through 2001 and monitoring surveys every 5 years beginning in 2006 and most recently in 2021. Three study sites were established on Lee Vining Creek for the ongoing riparian monitoring between Saddlebag Lake and the confluence of Slate Creek. Geomorphology parameters have been collected at all three sites throughout the monitoring program. No significant changes to channel width, depth, or sinuosity have been observed over the years as part of the monitoring (Read, 2022).

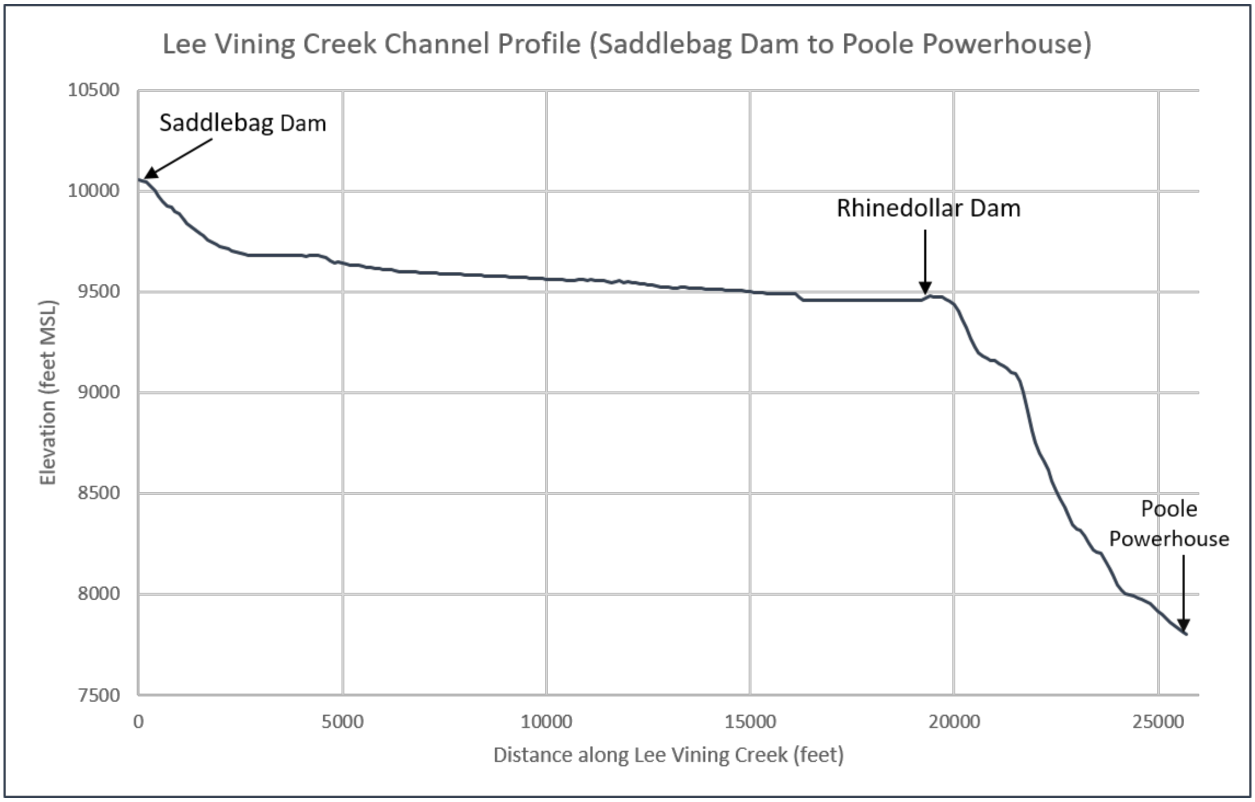


Figure 6.3-8. Channel Profile of Lee Vining Creek.

Lee Vining Creek below Poole Powerhouse alternates between step pool, cascade, and pool-riffle channel morphology (Table 6.3-1). Channel substrates are dominated by large boulder and cobbles mixed with sand and gravel deposits. The Lower Lee Vining Creek Channel Morphology (AQ-6) Study was conducted between Poole Powerhouse and LADWP Diversion Dam during summer and fall of 2022 and the fall of 2023 (see the AQ-6 Final Technical Report, which is included in Volume III of this DLA). Five reaches were identified in lower Lee Vining Creek that typically have gradients ranging from approximately 1 percent to 4 percent (Table 6.3-1). A channel profile of Lee Vining Creek between Poole Powerhouse and LADWP Diversion Dam is shown on Figure 6.3-9. Large wood throughout lower Lee Vining Creek is locally sourced from streamside slopes and is comprised of relatively stable and persistent wood pieces greater than 30 inches in diameter (see the AQ-6 Final Technical Report [Volume III of this DLA]). Large wood jams trap large sediment wedges and provide significant influence on channel morphology and sediment dynamics in the reach.

Table 6.3-1. Lower Lee Vining Creek Channel Morphology

Name	Morphology	Gradient (percent)	Length (feet)
Reach 1—Poole Powerhouse to Big Bend Campground	plane bed and pool-riffle	2.1	4,020
Reach 2—Big Bend Campground to near Aspen Campground	cascade and step pool	3.7	6,230

Name	Morphology	Gradient (percent)	Length (feet)
Reach 3—near Aspen Campground to large meadow complex	pool-riffle	0.2	3,840
Reach 4—Large meadow complex to Lower Lee Vining Creek Campground	plane bed	1.4	8,568
Reach 5—Lower Lee Vining Creek Campground to LADWP Diversion Dam	plane bed and pool-riffle	1.4	9,447

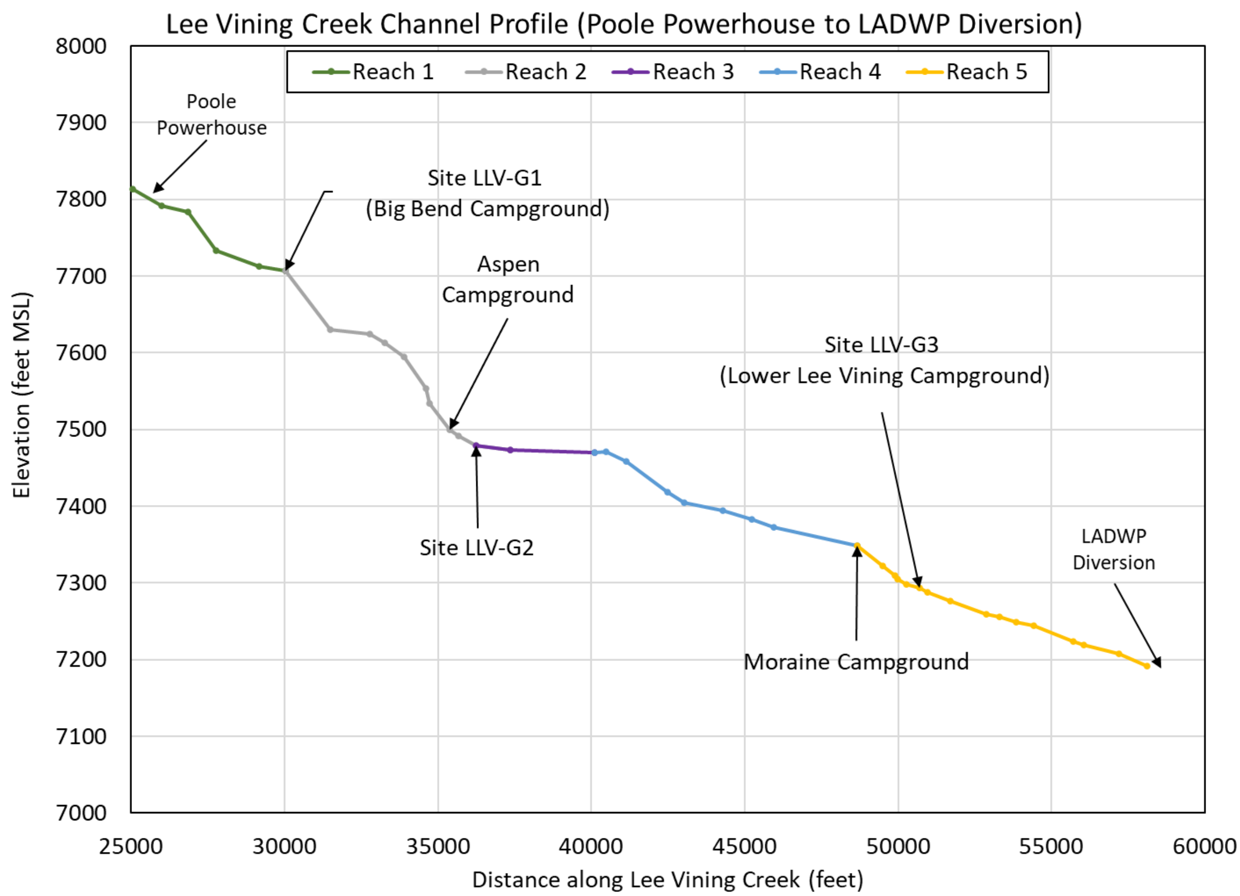


Figure 6.3-9. Longitudinal Profile of Lower Lee Vining Creek.

Information available downstream of the Project suggests average annual sediment yield at the LADWP diversion structure was approximately 28,000 tons per year in 2000 (R2, 2002). At that time, Lee Vining Creek above the diversion structure was a cobble bed stream with a gradient of 1.6 percent and a bankfull top-width of approximately 35 feet (R2, 2002). R2 (2002) conceptualized that (1) during flood/rising flows, fine sediment is transported over the armor layer from upstream sources; (2) when flows are high enough to break up the armor layer, large quantities of sands and fine gravels become available for transport; and (3) supply of the fine fraction is depleted if flows remain high over an extended period, resulting in higher sediment transport on the rising limb of the hydrograph. During the 28-year historical flow record (water years

1990 to 2017) 20 to 45 percent of bedload on Lee Vining Creek was transported during the summer of 2017 (LAWDP, 2021). Hydraulic modelling and sediment transport calculations conducted by Stillwater Sciences indicated the threshold for initiation of motion for gravel- and cobble-dominant sediment textural patches occurs at approximately 200 to 250 cfs. This agrees with R2's estimate that the initial breakup of the armor layer in Lee Vining Creek occurs at approximately 250 cfs (R2, 2000 as cited in R2, 2002). R2 (2002) suggests that the LADWP diversion structure traps the majority of the coarse sediment fraction (coarse sands, gravels, and cobbles) but passes the majority of the fine sediment fraction (clays, silts, and very fine sands). The diversion structure was estimated by R2 (2002) to trap 320 tons per year of sediment—primarily sand—on an annual basis.

6.3.2. Potential Adverse Effects and Issues

Saddlebag Lake, Ellery Lake, and Tioga Lake are naturally occurring lakes that existed prior to construction of the Project. All three lakes have historically trapped coarse sediment delivered from upstream source areas, and the fluvial processes of Lee Vining and Glacier Creeks have naturally adjusted to this. Downstream of the dams, post-glacial topography and sediment enters the system via hill slopes and unimpaired tributaries (e.g., Slate Creek, Warren Fork). Because peak stream flows are allowed to pass Project dams in some water years, potential Project-related changes in sediment supply and transport are concentrated to lower Lee Vining Creek downstream of Rhinedollar Dam to the LADWP Lee Vining Creek Diversion Dam.

The Project has implemented an Erosion Control Plan to limit erosion during any Project-related maintenance (SCE, 1997). There is no evidence that erosion and sedimentation is being increased by Project O&M.

6.3.2.1. Effects of Project Operations and Maintenance on Channel Morphology and Fluvial Processes

Dams can affect channel morphology and fluvial processes by reducing wood and sediment supply to downstream reaches and decreasing sediment transport by decreasing peak flow magnitude and frequency. This can lead to channel incision, bed coarsening, and reduced wood loading.

Operations have the potential to winnow sand and finer gravels from the channel bed by increasing flows above the threshold of motion, particularly during late summer and fall after the snowmelt peak has decreased. Since 2015, hydro-resource optimization occurs in all water year types but is most frequent in normal years; seasonally it is more frequent in fall and winter. Hydro-resource optimization events at Poole Powerhouse result in flow fluctuations on the order of 60 to 70 cfs (see the *Operations Model (AQ-5) Final Technical Report*, which is included in Volume III of this DLA).

Channel morphology surveys conducted from June 2022 to October 2023 show a functional channel with active sediment transport and floodplain connectivity during high flows (see the AQ-6 Final Technical Report [Volume III of this DLA]). At the study sites, the channel supported abundant wood accumulations promoting floodplain connection with the stream channel during common floods (i.e., 1.5- to 3-year flood events), and showed little evidence of channel incision. Tracer rock studies coupled with bed grain size assessment suggest that gravel is mobile and abundant in lower Lee Vining Creek. None of the observed channel characteristics suggest the channel morphology in lower Lee Vining Creek is being altered by Project operations.

NO ACTION

Under the No Action, SCE will continue O&M of the Project in accordance with the terms and conditions of the existing FERC license.

PROPOSED ACTION

With no change in O&M activities proposed as part of the Proposed Action, potential Project effects are expected to be the same as those described for the No Action above. There are no unavoidable adverse effects to geology and soils from the continued operation and maintenance of the Project under the Proposed Action.

6.3.2.2. Consistency with Current Resource Management Objectives (Forest Plans, Basin Plan, etc.)

SCE has reviewed the desired conditions in the *Land Management Plan for the Inyo National Forest* (USFS, 2019) to assess whether the Project is consistent with management objectives. The desired conditions relating to geology and soils, with which the Project is consistent, include:

- WTR-FW-DC 03: Watersheds are fully functioning or trending toward fully functioning and resilient; recover from natural and human disturbances at a rate appropriate with the capability of the site; and have a high degree of hydrologic connectivity laterally across the floodplain and valley bottom and vertically between surface and subsurface flows. Physical (geomorphic, hydrologic) connectivity and associated surface processes (such as run-off, flooding, in-stream flow regime, erosion, and sedimentation) are maintained and restored. Watersheds provide important ecosystem services such as high-quality water, recharge of streams and shallow groundwater, and maintenance of riparian communities. Watersheds sustain long-term soil productivity.

- WTR-FW-DC 06: The sediment regime within waterbodies is within the natural range of variation. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport.

Results from the AQ-6 Study suggest that these management objectives are being met from a geomorphological perspective. The channel bed is relatively mobile, there is no evidence of systematic aggradation or incision, and the channels are not incised, providing connection with the floodplain during floods.

6.3.2.3. Proposed Mitigation and Enhancement Measures

SCE is not proposing to change operations of the Project and has not identified any effects to geology and soils resulting from O&M activities. SCE is proposing to continue implementation of Erosion Control Plan as part of PME-4, Resource Management Plan (see Appendix E.1, *Protection, Mitigation, and Enhancement Measures*).

6.4. WATER RESOURCES

The information presented in this section describes the water and hydrological resources on and in the vicinity of the Project. The area assessed for water resources includes the Project reservoirs (Saddlebag Lake, Tioga Lake, and Ellery Lake), Project-affiliated stream reaches (upper Lee Vining Creek and lower Lee Vining Creek), and Glacier Creek between Tioga Dam and its confluence with Lee Vining Creek.

In 2022 and 2023, a Stream and Reservoir Water Quality (WQ-1) Study was conducted as part of the relicensing effort. The WQ-1 Final Technical Report is included in Volume III of this DLA.

6.4.1. AFFECTED ENVIRONMENT

Lee Vining Creek drains the eastern Sierra Nevada crest. Glacier Creek is a tributary that flows from Tioga Lake (Figure 6.4-1). Mount Dana (13,053 feet amsl), the highest peak in Mono Basin, and several other peaks above 12,000 feet amsl rim the watershed boundary (Jones & Stokes Associates, 1993). Lee Vining Creek drops precipitously down the eastern Sierra escarpment from Ellery Lake at 9,500 feet amsl to Poole Powerhouse at 7,825 feet amsl (Jones & Stokes Associates, 1993).

In order to describe the affected environment for water resources, SCE implemented two studies: the WQ-1 Study and the Operations Modeling (AQ-5) Study. The following sections describe the results of these studies. The WQ-1 and AQ-5 Final Technical Reports are included in Volume III of this DLA.

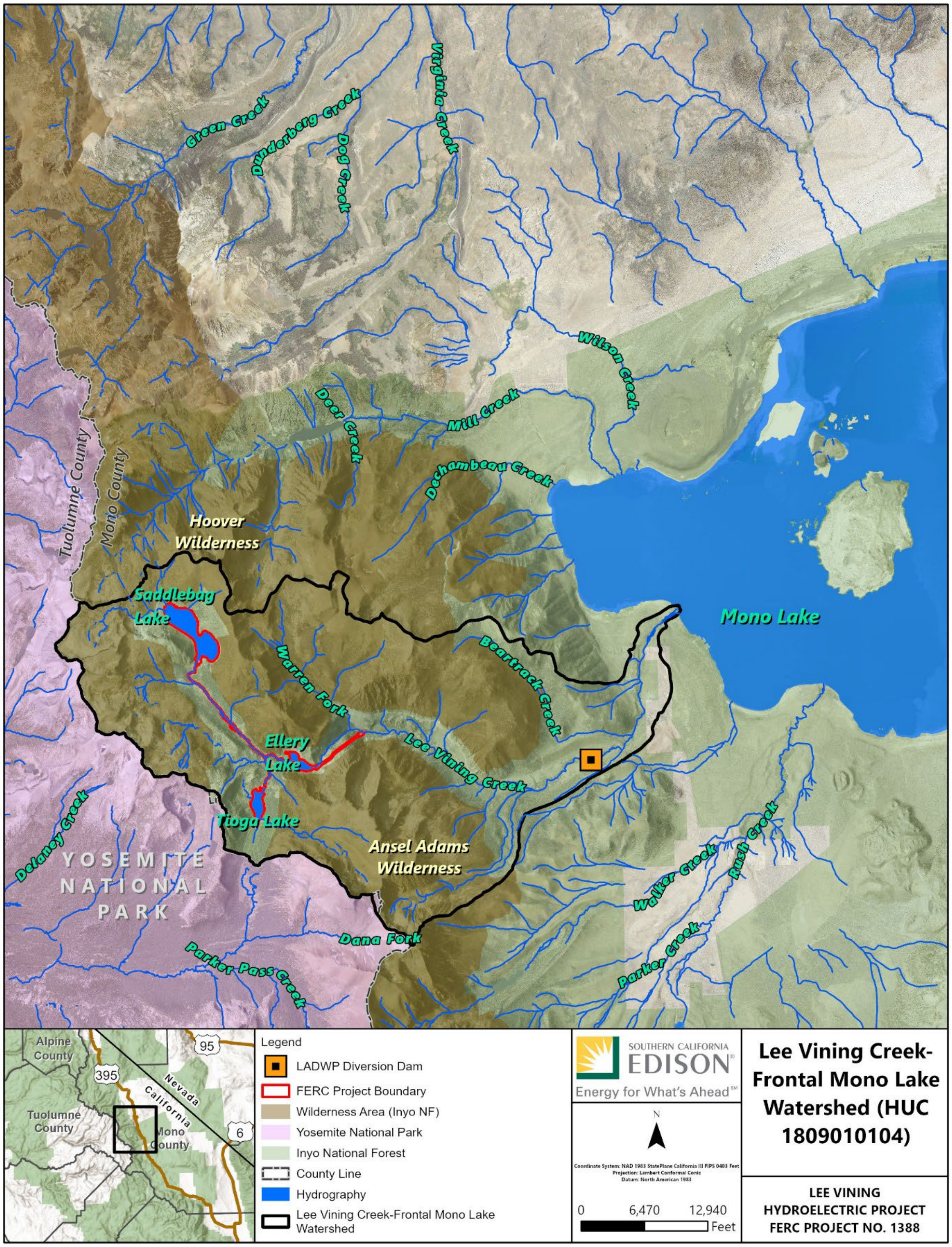


Figure 6.4-1. Lee Vining Creek—Frontal Mono Lake Watershed.

6.4.1.1. Water Use in the Project Area

Three storage reservoirs are in the Lee Vining Creek watershed: Saddlebag Lake, Tioga Lake, and Ellery Lake. Saddlebag Lake and Tioga Lake drain into Ellery Lake. Saddlebag Dam, in the headwaters of Lee Vining Creek, impounds Saddlebag Lake. Minimum flow requirements are determined annually for Saddlebag Dam in consultation with the USFS. Minimum flow requirements below Tioga Dam depend on water year, inflow, and month. Ellery Lake, impounded by Rhinedollar Dam, serves as the regulating reservoir for the Poole Powerhouse, and is fed by flows from both Saddlebag Dam and Tioga Dam. Minimum flow requirements below Poole Powerhouse depend on the time of year (Table 6.4-1). See Section 3.5.1, *Minimum Instream Flow Requirements*, for additional details.

Table 6.4-1. Minimum Flow Requirements by Location

Location	Water Year Type	Minimum Flow (cfs)	Duration
Below Saddlebag Dam [a]	Wet	14	Year-round
	Normal	9	Year-round
	Dry	6	Year-round
Below Tioga Dam	Wet or Normal	If inflow is <2 cfs, the flow must be equal to the inflow and cannot exceed 2 cfs. If the inflow is >2 cfs, the flow must be 2 cfs until the lake water surface elevation is within 2 feet of the main spillway crest; the flow then changes to greater than 60% of the inflow.	May through September
	Dry	If the inflow is <2 cfs, the flow must be equal to the inflow and cannot exceed 2 cfs. If the inflow is >2 cfs, the flow must be 2 cfs until the lake water surface elevation is within 2 feet of the main spillway crest; the flow then changes to the natural inflow.	May through September
	All	2 cfs or the natural inflow	October and November
	All	Equal to the natural inflow	December through April
Below Poole Powerhouse [b]	All	27 cfs or the natural flow, whichever is less	August through May
	All	89 cfs or the natural flow, whichever is less	June and July

cfs = cubic feet per second
[a] Annual consultation with USFS no later than May 1 of each calendar year. If no agreement is reached, minimum flows are as such.
[b] Flows here are measured by acoustic velocity meter.

SCE stores water in the Project reservoirs and releases it for power generation, which is the primary, non-consumptive use of water within the Lee Vining Creek watershed. SCE's storage and use of the water is prescribed by the existing FERC license, consistent with the 1933 Sales Agreement between the Southern Sierra Power Company (predecessor to SCE) and the LADWP. As described below, once water has left the Project Area, SCE has no control over downstream diversions. The Poole Powerhouse is operated at a flow consistent with the available water supply. During periods of high streamflow, the Project is operated at capacity (105 cfs); during periods of low flow, water is diverted conservatively to assure a continuous water supply through the season.

Recreation is a secondary use of water within the Lee Vining Creek watershed; maintaining reservoir levels for recreation is identified as an operational condition in the FERC license.

Approximately 5 miles downstream of the Project, much of the flow is diverted into the Los Angeles Aqueduct System by the LADWP (FERC, 1992; SWRCB, 1994; Figure 6.4-1). LADWP oversees water management at the LADWP diversion and manages minimum flows into Mono Lake in accordance with their license.

While meeting the LADWP Sales Agreement targets and the required FERC minimum flows (Table 6.4-1), SCE also optimizes powerhouse generation to meet load requests from the California ISO. This process of delivering intraday load to satisfy demands, known as Hydro-resource Optimization. The Poole Powerhouse is typically activated during peak hours in response to grid demand. This operation leads to the release of flow into Lee Vining Creek below the Poole Powerhouse, with these instances generally lasting less than 8 hours. SCE is not proposing any changes to the way the Project is operated or maintained.

6.4.1.2. Flow Statistics

To estimate flow statistics at pertinent locations within the Lee Vining watershed, the existing USGS gage data were prorated based on drainage areas. The drainage areas of Lee Vining Creek and Glacier Creek at their confluence and the drainage area of Lee Vining Creek below Rhinedollar Dam were determined using the USEPA Waters Watershed Delineation tool from the Google Earth application (USEPA, 2020), specifically:

- USGS No. 10287655 (Lee Vining Creek below Saddlebag Lake) was adjusted by a factor of 2.14 to obtain the flows of Lee Vining Creek at the confluence with Glacier Creek.
- USGS No. 10287720 (Glacier Creek below Tioga Lake) was adjusted by a factor of 1.69 to obtain the flows of Glacier Creek at the confluence with Lee Vining Creek.
- The two prorated datasets at the confluence with Lee Vining Creek were summed and adjusted by a factor of 1.05 to obtain the flows of Lee Vining Creek below Rhinedollar Dam.

The mean annual flow at Lee Vining Creek below Rhinedollar Dam is approximately 22.44 cfs, and monthly mean flows range between 15.34 and 117.99 cfs. Annual results are shown in Table 6.4-2.

Table 6.4-2. Monthly Mean, Minimum, and Maximum Flows (cfs) for Lee Vining Creek, Outlet from Ellery Lake, Sum of Rhinedollar Spill and Poole Powerhouse Flow

Water Year	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	June	July	Aug.	Sep.
1997–1998	27.03	18.50	10.13	17.48	25.75	31.26	30.93	31.03	136.67	181.34	54.94	29.30
1998–1999	26.03	24.13	16.10	18.74	12.06	13.00	20.30	85.30	140.86	66.14	26.71	18.03
1999–2000	17.49	3.79	1.82	16.39	15.28	15.97	31.10	82.41	108.45	41.39	24.23	14.87
2000–2001	17.00	20.67	17.23	15.65	13.86	16.03	24.00	94.53	34.63	21.94	10.88	9.89
2001–2002	16.98	21.43	13.68	12.45	15.36	16.52	33.37	61.58	99.12	38.61	18.00	12.01
2002–2003	15.35	24.04	17.29	20.03	18.46	19.29	19.60	74.65	139.98	49.45	17.97	14.20
2003–2004	18.59	24.13	23.58	18.88	21.55	34.13	46.13	70.78	80.99	39.23	16.71	10.27
2004–2005	12.45	26.03	24.90	22.03	19.53	22.56	29.15	114.52	167.77	142.34	42.29	23.83
2005–2006	25.55	34.00	23.71	23.35	22.07	22.55	30.23	123.64	257.23	144.75	56.29	35.10
2006–2007	39.42	27.08	39.00	25.45	12.00	22.10	28.61	70.94	47.57	24.91	9.28	8.47
2007–2008	17.77	15.04	10.05	11.84	11.37	13.43	23.33	76.92	95.50	43.55	13.52	14.21
2008–2009	12.71	13.58	17.03	10.87	12.04	14.55	30.23	106.23	89.83	52.68	24.78	20.92
2009–2010	26.18	17.32	17.03	16.42	13.36	15.55	20.80	41.91	164.93	112.96	29.81	24.43
2010–2011	35.07	37.20	44.42	29.30	18.46	17.03	51.77	80.26	190.39	204.97	116.61	63.30
2011–2012	41.48	16.70	7.31	3.74	4.09	3.79	27.36	65.61	40.57	22.10	14.68	11.33
2012–2013	11.42	11.32	11.61	9.16	9.06	11.72	36.47	57.89	54.10	22.19	8.52	7.20
2013–2014	6.68	12.25	21.45	13.97	14.82	17.39	28.39	59.37	54.10	22.52	14.80	26.81
2014–2015	9.62	17.32	16.35	13.94	14.79	19.23	21.12	43.20	40.93	23.87	11.13	10.00
2015–2016	16.88	21.07	18.67	13.77	15.63	19.77	39.80	76.23	125.87	45.77	38.57	13.30
2016–2017	25.55	26.75	16.30	19.57	18.61	29.23	36.79	126.94	286.53	209.99	92.21	49.68
2017–2018	26.16	14.10	14.90	13.90	16.07	16.00	58.42	123.44	134.13	90.38	51.08	37.77
2018–2019	15.16	8.66	10.41	11.77	16.93	8.92	26.83	70.81	194.92	132.15	56.60	29.51
2019–2020	23.42	21.60	23.94	23.32	15.93	22.70	34.76	70.14	43.07	21.74	13.82	13.00
2020–2021	12.58	13.43	13.45	12.00	14.13	6.98	24.08	59.44	40.83	16.06	11.19	19.66
2021–2022	17.45	21.73	17.66	14.42	14.10	10.12	33.32	62.77	58.76	22.97	22.34	27.23
2022–2023	11.81	11.33	11.73	12.87	12.72	64.43	68.74	121.68	240.00	284.32	87.65	39.10

Water Year	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	June	July	Aug.	Sep.
Mean	20.23	19.35	17.68	16.20	15.34	19.39	32.91	78.93	117.99	79.93	34.02	22.44
Maximum	134	67	171	74	52	145	159	244	423	407	163	100
Minimum	0	1	1.5	3.5	2.4	3.6	1.3	9.6	8.8	10	6.6	5.3

cfs = cubic feet per second
Gaps in prorated combined data are due to months with missing data from USGS No. 10287720 (Glacier Creek below Tioga Lake).

Figure 6.4-2 below illustrates the trend for natural inflows into Lee Vining Creek from 1998 to 2023.

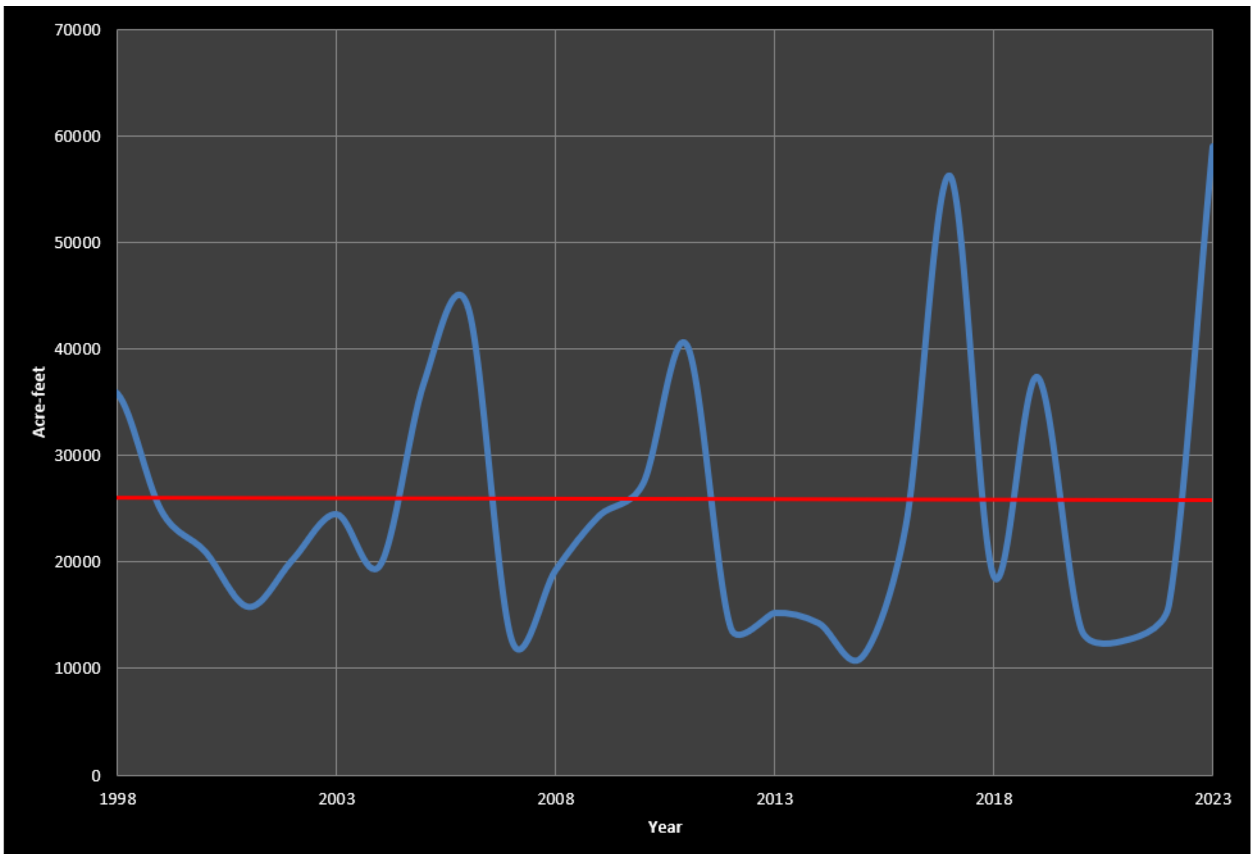


Figure 6.4-2. Trend for Inflows—Lee Vining Creek (1998–2023).

6.4.1.3. Intraday Releases and Hydraulic Modeling

In accordance with the AQ-5 Study, an intraday model was developed to quantify the frequency, magnitude, duration, and seasonality of intraday releases from Poole Powerhouse in response to Hydro-resource Optimization needs. This model was developed using Python code in a Jupyter Notebook. Additionally, a hydraulic model was developed using the HEC-RAS Version 6.3.1 to describe the stage-discharge relationship at Poole Powerhouse and in the downstream channel.

Table 6.4-3 shows the duration, magnitude, and frequency of Hydro-resource Optimization events at the Project by season, recorded from 2015 to 2023. Average duration of Hydro-resource Optimization events have been about 3 to 5.5 hours. Magnitudes have ranged from approximately 60 to 67 cfs. The average number of events per season ranged from about 18 to 38.

Table 6.4-3. Duration, Magnitude, and Frequency of Hydro-resource Optimization Events by Season (2015–2023)

Season	Duration (hours)	Average Magnitude (cfs)	Frequency (average number)
Fall	3.71	67.42	28.13
Winter	2.99	60.80	37.78
Spring	4.03	65.49	21.89
Summer	5.49	66.82	18.78

cfs = cubic feet per second

Table 6.4-4 shows the water year type of each year. Table 6.4-5 shows the duration, magnitude, and frequency of Hydro-resource Optimization events at the Project by water year type, recorded from 2015 to 2021. Average duration of Hydro-resource Optimization events have been about 4 hours. Magnitudes have ranged from approximately 56 to 65 cfs. The most events occurred during normal water type years with 153 events; the fewest events occurred during wet years with 67 events.

Table 6.4-4. Distribution of Water Year Type

Dry Years	Normal Years	Wet Years
2015	2016	2017
2020	2018	2019
2021	--	--

-- = no data/not applicable

Table 6.4-5. Duration, Magnitude, and Frequency of Hydro-resource Optimization Events by Water Year Type (2015–2021)

Water Year Type	Duration (hours)	Average Magnitude (cfs)	Frequency (average number)
Dry	4.32	61.43	79.33
Normal	3.91	65.20	153.5
Wet	4.06	56.81	67

cfs = cubic feet per second

To help interpret the results from the intraday statistical model, a one-dimensional hydraulic model was developed to quantify effects on depths and velocities in the Lee Vining Creek downstream of Poole Powerhouse. The hydraulic model was built in HEC-RAS Version 6.3.1 and used a combination of surveyed cross sections collected by Stillwater Sciences in 2022 and a Light Detection and Ranging imagery (LiDAR) digital elevation model from a previous flood study by HDR.

The AQ-5 Final Technical Report is included in Volume III of this DLA.

6.4.1.4. Monthly Flow Duration Curves

Monthly flow duration curves were developed using HEC-DSSVue Version 2.6 software with the prorated data discussed above. Flow duration curves are included in DLA Appendix E.2.

6.4.1.5. Water Rights

There has been minimal development within the Lee Vining Creek drainage area following Project construction. SCE has inherited water rights from previous owners starting from 1915 for diversion and storage (Diamond and Hicks, 1988). There are no existing or proposed consumptive uses of the water upstream of the Project, but LADWP uses water downstream of the Project for public water supply (SWRCB, 1989). Although water is stored in upstream reservoirs for power generation at Poole Powerhouse, there is no long-term net loss of water to downstream areas. Many water rights have been filed with the state; Table 6.4-6 provides a summary of the known water rights within the Project Area.

Table 6.4-6. Summary of Active Existing Water Rights in the Lee Vining Creek Watershed in the Project Area

POD ID	Applicant ID	Name	Diversion Value	Map ID
8222	S007775	Southern California Edison Company	110 cfs	8222
11270	A026539A	Southern California Edison Company	935 gpd	11270
11791	A005068	Southern California Edison Company	30 cfs	11791
20017	A000051	Southern California Edison Company	40 cfs	20017
21926	S007777	Southern California Edison Company	0 gpd	21926
22483	A026539B	Southern California Edison Company	50 cfs	22483
33298	F010218S	U.S. Inyo National Forest	6,240 gpd	33298
44976	F007808S	U.S. Inyo National Forest	325 gpd	44976

POD ID	Applicant ID	Name	Diversion Value	Map ID
7298	A026537	Southern California Edison Company	30 cfs	7298

Source: SWRCB, 2018

cfs = cubic feet per second; gpd = gallons per day; ID = identification number; POD = Point of Diversion

Water rights below the Project on Lee Vining Creek belong to LADWP (Water Right Licenses 10191 and 10192) (SWRCB, 1994). LADWP diverts water into the Los Angeles Aqueduct System via the Mono Basin Extension at an impoundment approximately 5 miles downstream of the Poole Powerhouse (LADWP, 1987). The LADWP Diversion Dam location is shown on Figure 6.4-1.

6.4.1.6. Water Quality Standards and Objectives

Federal water quality standards required by the Clean Water Act of 1970 are implemented under the authority of the State Water Resources Control Board (SWRCB) and Lahontan Regional Water Quality Control Board (LRWQCB). Every water body within the LRWQCB jurisdiction is designated a set of beneficial uses that are protected by appropriate water quality objectives as described in the Water Quality Control Plan for the Lahontan Region (Basin Plan) (LRWQCB, 2019).

The Basin Plan was revised in 2019 and sets forth water quality standards for waterbodies in the region including Lee Vining Creek and Ellery, Saddlebag, and Tioga Lakes (LRWQCB, 2019). No site-specific water quality standards are listed in the Basin Plan for Glacier Creek. Basin Plan water quality standards address existing and potential beneficial uses and water quality objectives. Beneficial uses established by the Basin Plan for Project waters relevant to water quality include municipal and domestic supply; water contact recreation; hydropower generation; navigation; water non-contact recreation; cold freshwater habitat; commercial and sportfishing; wildlife habitat; and spawning, reproduction, and/or early development. Additional beneficial uses listed in the Basin Plan include groundwater recharge and freshwater replenishment.

For smaller tributary streams in which beneficial uses are not specifically designated, they are granted with the same beneficial uses as the streams, lakes, or reservoirs to which they are a tributary. The Basin Plan defines the beneficial use abbreviations as the following:

- **Municipal and Domestic Supply (MUN)**—Uses of water for community, military, or individual water supply systems including, but not limited to, drinking water supply.
- **Agricultural Supply (AGR)**—Beneficial uses of waters used for farming, horticulture, or ranching, including, but not limited to, irrigation, stock watering, and support of vegetation for range grazing.
- **Industrial Process Supply (PRO)**—Uses of water for industrial activities that depend primarily on water quality.

- **Industrial Service Supply (IND)**—Uses of water for industrial activities that do not depend primarily on water quality including, but not limited to, mining, cooling water supply, geothermal energy production, hydraulic conveyance, gravel washing, fire protection, or oil well repressurization.
- **Ground Water Recharge (GWR)**—Beneficial uses of waters used for natural or artificial recharge of ground water for purposes of future extraction, maintenance of water quality, or halting of saltwater intrusion into freshwater aquifers.
- **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)**—Uses of water for hydroelectric power generation.
- **Water Contact Recreation (REC-1)**—Uses of water 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, whitewater activities, fishing, or use of natural hot springs.
- **Non-Contact Water Recreation (REC-2)**—Uses of water 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, tide pool 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.
- **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.
- **Wildlife Habitat (WILD)**—Uses of water that support terrestrial or wetland ecosystems including, but not limited to, preservation and enhancement of terrestrial habitats or wetlands, vegetation, wildlife (e.g., mammals, birds, reptiles, amphibians, invertebrates), or wildlife water and food sources.
- **Preservation of Biological Habitats of Special Significance (BIOL)**—Beneficial uses of waters that support designated areas or habitats, such as established refuges, parks, sanctuaries, ecological reserves, and Areas of Special Biological Significance, where the preservation and enhancement of natural resources requires special protection.
- **Spawning, Reproduction, and/or Early Development (SPWN)**—Uses of water that support high-quality aquatic habitats suitable for reproduction and early development of fish.

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 protected.

Basin Plan objectives are listed in Table 6.4-7. Additionally, under the State of California Antidegradation Policy, whenever the existing water quality is better than the water quality established in the Basin Plan (both narrative and numerical), such existing quality must be maintained unless appropriate findings are made under the policy. Some increase in pollutant level may be appropriate, if (1) a reduction in water quality would not seriously harm any species found in the water; (2) lower water quality is necessary to accommodate important economic or social development in the area in which the waters are located, and existing beneficial uses are protected; and (3) long-term or permanent water quality in Outstanding Natural Resource Waters (including Mono Lake) is not reduced.

Table 6.4-7. Basin Plan Water Quality Objectives

Objective	**Criteria**
Ammonia	1-hour and 4-day unionized ammonia criteria are temperature- and pH-dependent.
Bacteria [a]	The statewide numerical water quality objective for bacteria is a 6-week rolling geometric mean of *Escherichia coli* less than 100 colony forming units (cfu) per 100 milliliters (mL), calculated weekly, and a Statistical Threshold Value of 320 cfu/100 mL not to be exceeded by more than 10% of the samples collected in a calendar month, calculated in a static manner.
Biostimulatory substances	Shall not contain biostimulatory substances in concentrations that promote aquatic growths to the extent that such growths cause nuisance or adversely affect the water for beneficial uses.
Chemical constituents	Waters designated as MUN shall not contain concentrations of chemical constituents in excess of Maximum Contaminant Level or Secondary Maximum Contaminant Level based upon the California Code of Regulations, Title 22; and shall not contain concentrations of chemical constituents in amounts that adversely affect beneficial uses.
Chlorine	Shall not exceed either a median of 0.002 mg/L or maximum of 0.003 mg/L.
Color	Shall be free of coloration that causes nuisance or adversely affects the water for beneficial uses.
Dissolved oxygen	Concentration as percent saturation shall not be depressed by more than 10%, nor shall the minimum DO concentration be less than 80% of saturation; DO concentrations in waters with the beneficial uses COLD and SPWN shall not be less than 9.5 mg/L over a 7-day mean, nor less than 8 mg/L in 1 day.
Floating materials	For natural high-quality waters, concentrations of floating material shall not be altered to the extent that such alterations are discernable at the 10% significance level.

Objective	Criteria
Oil and grease	For natural high-quality waters, the concentration of oils, greases, or other film- or coat-generating substances shall not be altered.
Non-degradation of aquatic communities and populations	All wetlands shall be free from substances attributable to wastewater or other discharges that produce adverse physiological responses in humans, animals, or plants, or that lead to the presence of undesirable or nuisance aquatic life.
pH	In freshwaters with designated beneficial uses of COLD or WARM, changes in normal ambient pH levels shall not exceed 0.5 pH units.
Radioactivity	Radionuclides shall not be present in concentrations that are deleterious to human, plant, animal, or aquatic life, or that result in the accumulation of radionuclides in the food web to an extent that presents a hazard to human, plant, animal, or aquatic life. Waters designated as MUN shall not contain concentrations of radionuclides in excess of the limits specified in Table 4 of the California Code of Regulations, Title 22, Section 64443 (Radioactivity).
Sediment	The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect the water for beneficial uses.
Settleable materials	For natural high-quality waters, the concentration of settleable materials shall not be raised by more than 0.1 mL per liter.
Sport Fish[b]	For waters that include beneficial uses including COMM, WILD, and COLD, the mean methylmercury for the highest trophic level of fish shall not exceed 0.2 µg/g fish tissue within a calendar year.
Suspended materials	For natural high-quality waters, the concentration of total suspended materials shall not be altered to the extent that such alterations are discernible at the 10% significance level.
Taste and odor	For naturally high-quality waters, the taste and odor shall not be altered.
Temperature	For waters designated COLD, the temperature shall not be altered.
Toxicity	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Turbidity	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%.

Sources: LRWQCB, 2019; SWRCB, 2017

µg/g = micrograms per gram; cfu = colony forming units; COLD = cold freshwater habitat; DO = dissolved oxygen; mg/L = milligrams per liter; mL = milliliter; MUN = municipal and domestic supply; pH = indicates acidity or alkalinity of a solution; SPWN = spawning, reproduction, and/or early development; WARM = warm freshwater habitat

[a] The statewide amendment that modified the indicator bacteria to use an E. coli pathogen indicator and water quality objectives for the REC-1 beneficial use was adopted by the LRWQCB on June 28, 2023.

[b] Resolution 2017-0017, which includes new statewide numeric mercury objectives that protect the beneficial uses associated with the consumption of fish by both people and wildlife, was adopted by the SWRCB on June 28, 2023.

6.4.1.7. Water Quality

Water quality information discussed in this section includes data collected during 2022 and 2023 water quality assessment (WQ-1 Final Technical Report, provided in Volume III of this DLA) and other available and relevant historical data (Cohen, 2019; Lund, 1988; CEDEN, 2024; Salamunovich, 2017). These data include water temperature, dissolved oxygen (DO), conductivity, pH, nutrients, total dissolved solids (TDS) and total suspended solids (TSS), turbidity, bacteria, and mercury.

For the WQ-1 Study, water quality data was collected in Project reservoirs and Project-affected stream reaches during 2022 and 2023 (Figure 6.4-3). In situ and analytical water quality parameters were collected at three reservoirs (Saddlebag Lake, Ellery Lake, and Tioga Lake) during the spring (May/June), summer (July), and fall (October) of 2022 and 2023. Tabulated reservoir in situ data and analytical laboratory reports are provided in the WQ-1 Final Technical Report, provided in Volume III of this DLA. Data collected during the WQ-1 Study are summarized below and were compared to Basin Plan numeric surface water quality objectives (LRWQCB, 2019; SWRCB, 2017) and summarized in Section 6.4.2.3, *Consistency with Current Resource Management Objectives*.

Figure 6.4-3. Overview of Water Quality Study Sites.

WATER TEMPERATURE

Water temperatures in Project reservoirs were cold (less than 20 degrees Celsius [°C]) and exhibited natural variation due to changes in daytime and nighttime heating and cooling periods across seasons, as well as the moderating influences of the reservoirs (Table 6.4-8, Figure 6.4-4) (WQ-1 Final Technical Report, provided in Volume III of this DLA). Little thermal variation was observed with reservoir depth in Saddlebag Lake and Tioga Lake during spring and Lake Ellery during all seasons in 2022 and 2023. Strong thermal stratification was observed in Saddlebag Lake and Tioga Lake during summer and fall 2022 and 2023 with warmer temperatures in surface waters and cooler temperatures below the thermocline.

Table 6.4-8. Range (Count) of In Situ Data Collected 2022 and 2023

Location (Site ID)	Waterbody	Temperature (°C)	DO (% sat.)	DO (mg/L)	Specific Conductance (µS/cm)	pH (s.u.)	Turbidity (NTU)
Lee Vining Creek Watershed							
Lee Vining Creek inflow to Saddlebag Lake (LV-1)	Stream	5.5–16.9 n=5	99–106 n=5	6.8–9.0 n=5	7–11 n=5	6.–8.7 n=5	0.4–1.1 n=3
Saddlebag Lake (LV-2)	Reservoir	4.2–16.1 n=114	23–124 n=114	2.–9.9 n=114	18–34 n=114	5.1–8. n=114	0–0.6 n=94
Lee Vining Creek between Saddlebag Dam and its confluence with Slate Creek (LV-3)	Stream	4.1–16.1 n=5	101–107 n=5	6.9–9.0 n=5	18–25 n=5	6.6–7.6 n=5	0.4–0.7 n=3
Lee Vining Creek between its confluence with Slate Creek and Glacier Creek (LV-4)	Stream	2.5–18.4 n=6	102–115 n=6	6.7–10.9 n=6	14–25 n=6	6.5–7.2 n=6	0.4–0.5 n=4
Lee Vining Creek between its confluence with Glacier Creek and Ellery Lake (LV-5)	Stream	1.9–14.8 n=6	102–116 n=6	7.3–10.7 n=6	16–38 n=6	6.6–7.4 n=6	0.3–0.5 n=4
Lee Vining Creek inflow to Ellery Lake (LV-6)	Stream	2.1–14.2 n=6	102–106 n=6	7.3–9.9 n=6	16–39 n=6	6.5–7.4 n=6	0.3–0.5 n=4
Ellery Lake (LV-7)	Reservoir	4.6–16.8 n=22	99–111 n=22	7.–9.7 n=22	16–33 n=22	5.9–7.7 n=22	0.3–0.9 n=19
Lee Vining Creek immediately downstream of Poole Powerhouse (LV-8)	Stream	5.1–16.8 n=6	96–104 n=6	7.5–9.7 n=6	17–34 n=6	6.7–7.4 n=6	0.3–0.7 n=4
Lee Vining Creek upstream of the LADWP Diversion (LV-9)	Stream	4.8–13.6 n=6	101–107 n=6	8.5–9.9 n=6	25–59 n=6	6.9–7.9 n=6	0.6–1.7 n=4
Glacier Creek Watershed							
Glacier Creek inflow to Tioga Lake (LV-10)	Stream	2.5–16. n=6	99–105 n=6	6.9–9.3 n=6	18–58 n=6	6.6–8.3 n=6	0.2–.6 n=4

Location (Site ID)	Waterbody	Temperature (°C)	DO (% sat.)	DO (mg/L)	Specific Conductance (µS/cm)	pH (s.u.)	Turbidity (NTU)
Tioga Lake (LV-11)	Reservoir	4.6–16.3 n=96	0–116 n=96	0.01–8.8 n=96	22–42 n=96	5.1–8. n=96	0.–1.4 n=79
Glacier Creek downstream of Tioga Dam (LV-12)	Stream	3.2–13.4 n=6	96–113 n=6	7.4–10.7 n=6	16–38 n=6	6.6–7.2 n=6	0.3–0.5 n=4

°C = degrees Celsius; % sat. = percent saturation; µS/cm = microSiemens per centimeter; ID = identification number; mg/L milligrams per liter; NTU = nephelometric turbidity units; s.u. = standard units

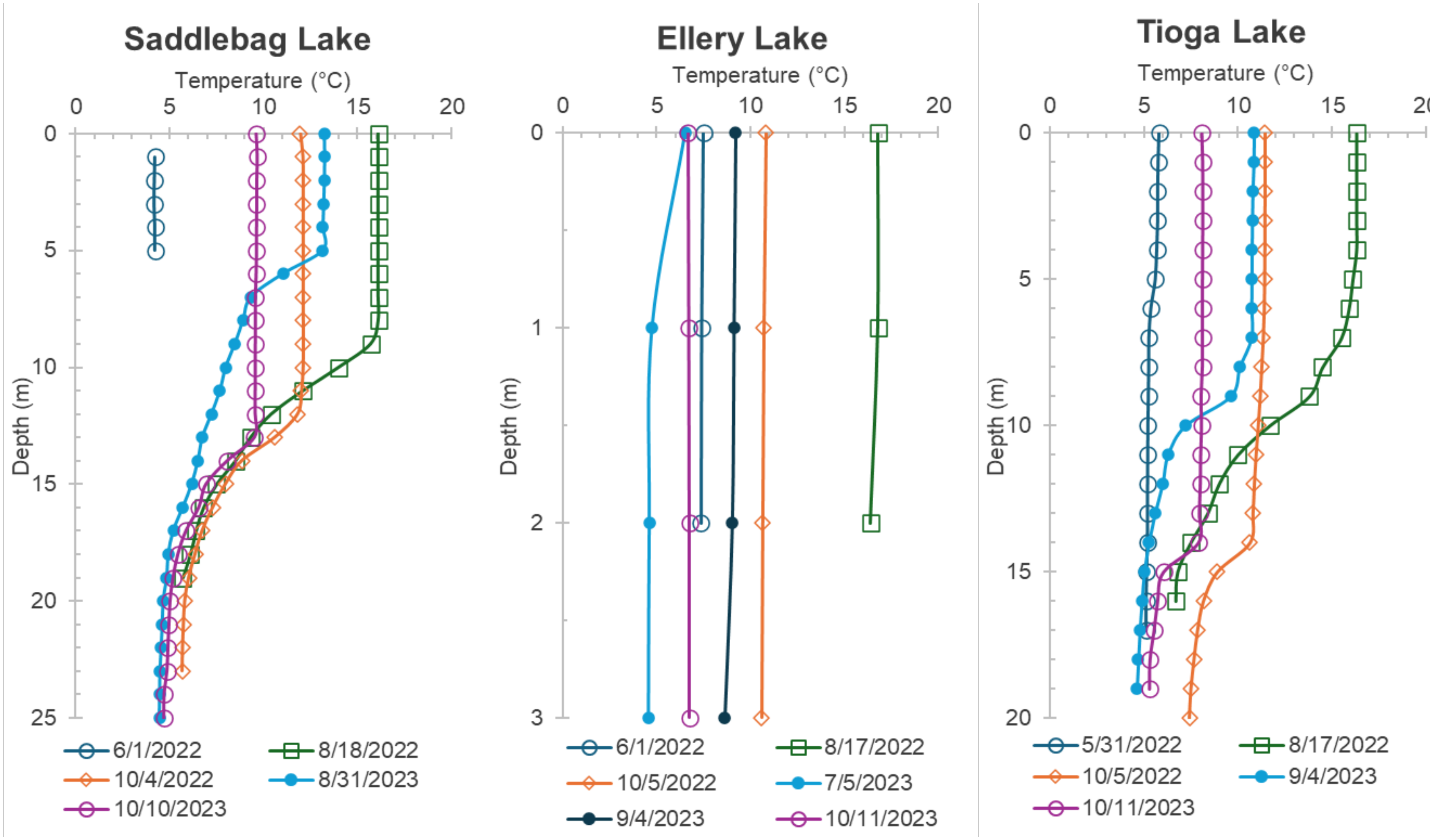


Figure 6.4-4. Vertical Temperature Profiles Collected in Project Reservoirs, 2022 and 2023.

Water temperatures in Lee Vining and Glacier Creeks were cold (less than 20 °C) and exhibited natural variation throughout the watersheds due to changing influences of tributary and groundwater inputs, changes in daytime and nighttime heating and cooling periods across seasons, and the moderating influences of the reservoirs (Table 6.4-9, Figure 6.4-5) (WQ-1 Final Technical Report, provided in Volume III of this DLA). Water temperatures in Lee Vining Creek and Glacier Creek were generally coldest during the spring and warmest during the summer with few exceptions (e.g., Glacier Creek above Tioga Lake [Site LV-10]). In Glacier Creek, water temperatures were generally higher at the inflow to Tioga Lake (Site LV-10) than downstream of Tioga Dam (Site LV-12).

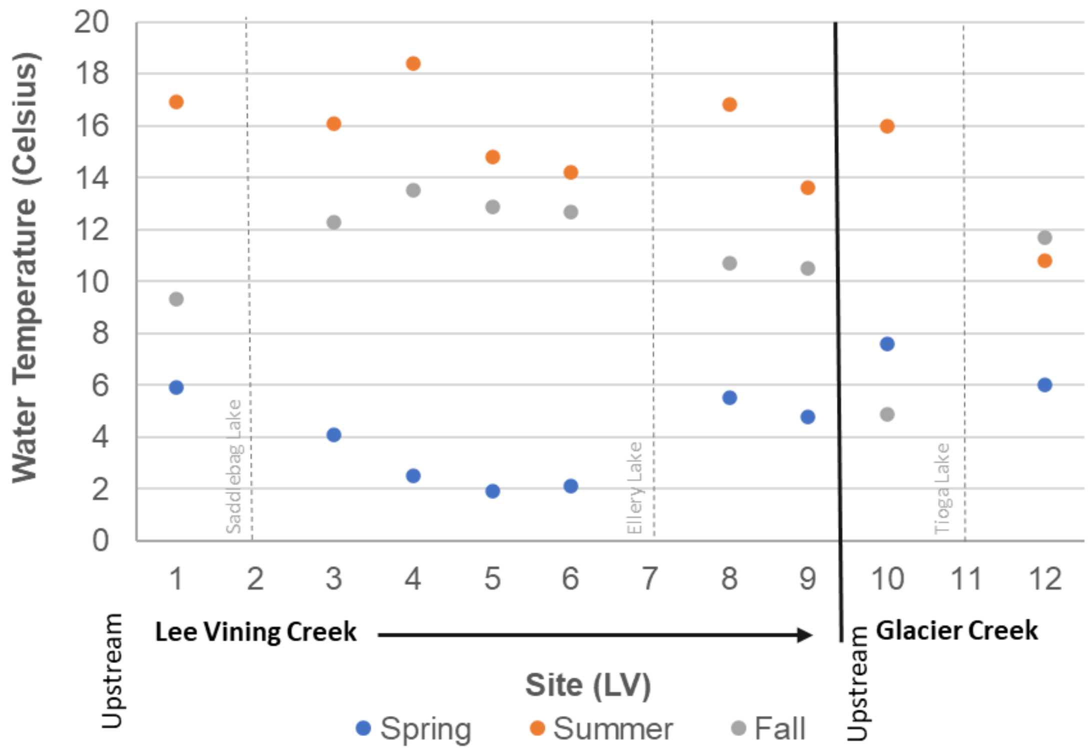


Figure 6.4-5. Stream Temperature Collected in Lee Vining Creek and Glacier Creek, 2022.

The water temperatures reflect similar patterns to data collected in Project reservoirs and their outlet streams from 2015 to 2017 (Cohen, 2019; WQ-1 Final Technical Report, provided in Volume III of this DLA) and on seven dates in 1986 and 1987 (0.01 °C [under ice in Tioga Lake in March 1987] to 14.7°C; Lund, 1988); Lee Vining Creek downstream of Poole Powerhouse on single dates in 2000, 2011, and 2019 (12.1 to 14.7 °C; CEDEN, 2024); and in upper Lee Vining Creek immediately downstream of Saddlebag Lake in September 2016 (9.2 to 13.8 °C) (Salamunovich, 2017).

DISSOLVED OXYGEN

DO in Project reservoirs exhibited seasonal variation (Table 6.4-8, Figure 6.4-6, Figure 6.4-7) (WQ-1 Final Technical Report, provided in Volume III of this DLA). Little DO variation was observed with reservoir depth in Saddlebag Lake and Tioga Lake during spring and Lake Ellery during all seasons during 2022 and 2023. Chemical (i.e., DO) stratification was apparent during summer and fall 2022 and 2023 with higher concentrations of DO in surface waters and lower concentrations of DO below the thermocline; increases in DO were often observed in the metalimnion. In Tioga Lake, below the thermocline, DO decreased with depth and reached hypoxic levels (less than 2 micrograms per liter [mg/L]) during summer and fall and anoxia (less than 0.5 mg/L) was observed at the sediment-water interface during the fall.

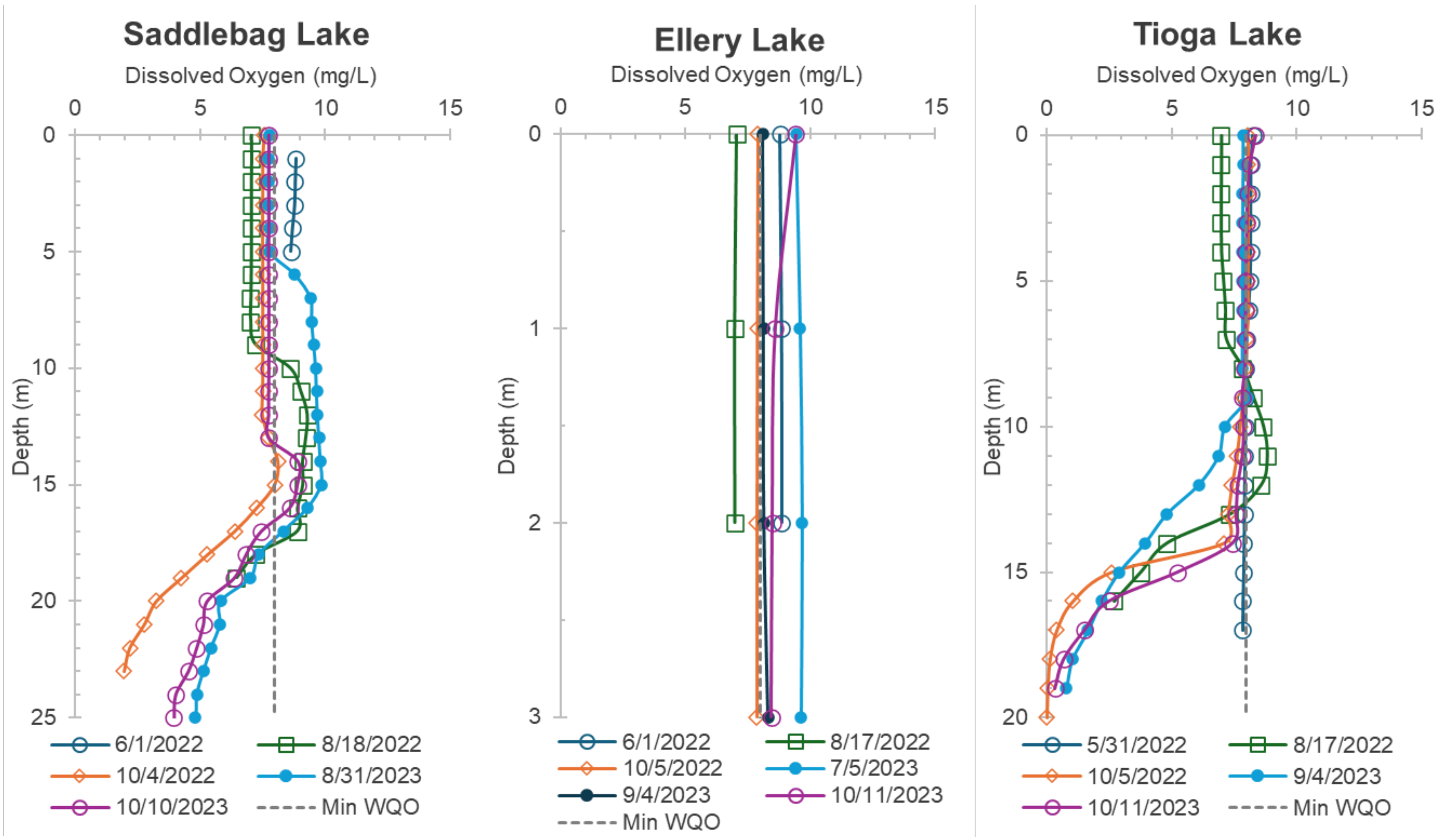


Figure 6.4-6. Dissolved Oxygen Concentration Profiles Collected in Project Reservoirs, 2022 and 2023.

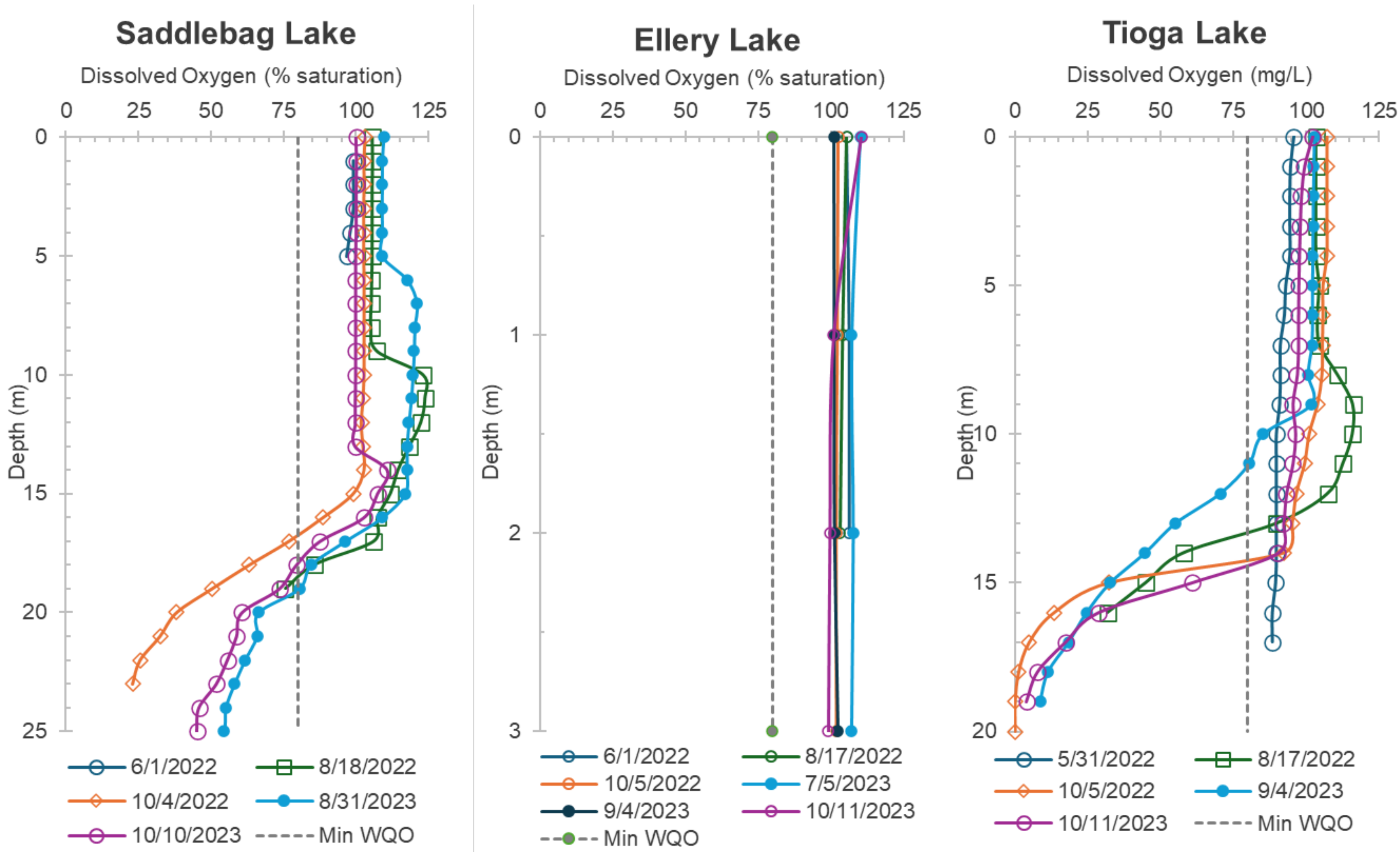


Figure 6.4-7. Dissolved Oxygen Percent Saturation Profiles Collected in Project Reservoirs, 2022 and 2023.

DO levels in Lee Vining Creek and Glacier Creek were similar throughout the watersheds with some seasonal variation (Table 6.4-8, Figure 6.4-8) (WQ-1 Final Technical Report, provided in Volume III of this DLA). DO concentrations and percent saturation were generally higher during the cool winter months and lower during the summer months when water temperatures were warmest.

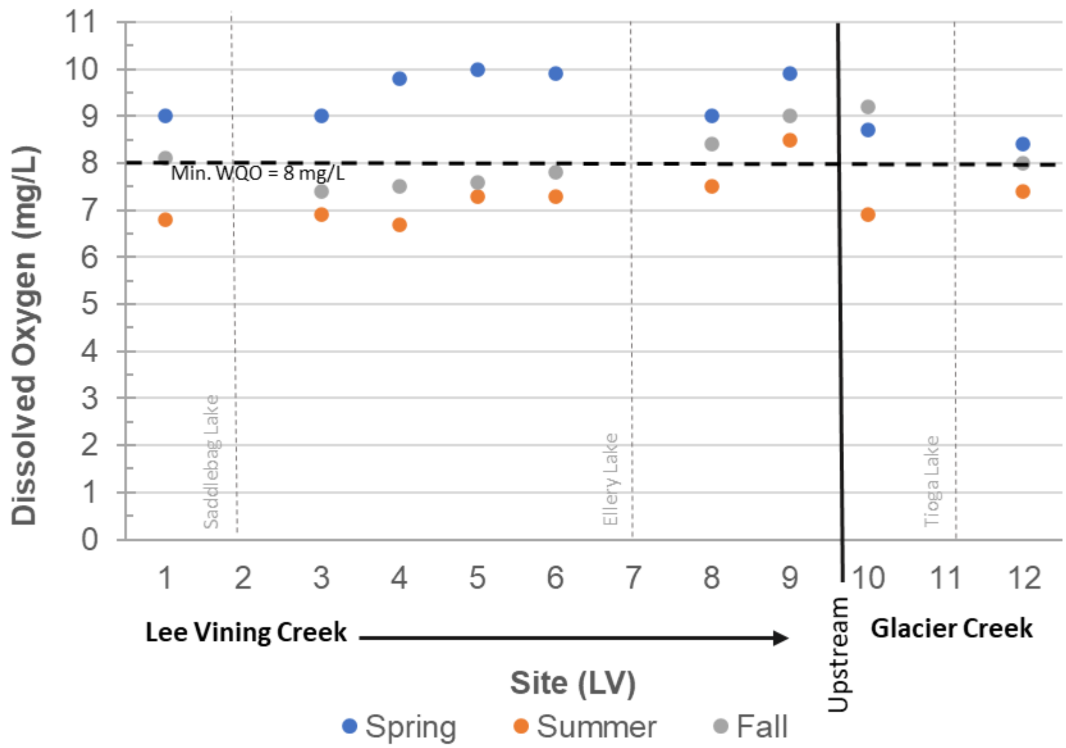


Figure 6.4-8. Dissolved Oxygen Concentration Collected in Lee Vining Creek and Glacier Creek, 2022.

The DO concentrations reflect similar patterns to data collected in Project reservoirs and their outlet streams from 2015 to 2017 (Cohen, 2019; WQ-1 Final Technical Report, provided in Volume III of this DLA) and on seven dates in 1986 and 1987 (Lund, 1988), Lee Vining Creek downstream of Poole Powerhouse on single dates in 2000, 2011, and 2019 (7.4 to 8.0 mg/L; CEDEN, 2024), and in upper Lee Vining Creek immediately downstream of Saddlebag Lake in September 2016 (7.2 mg/L to 9.6 mg/L) (Salamunovich, 2017). Hypoxia was also recorded at depth in Tioga Lake while stratified in late summer (Cohen, 2019), as well as at depth in Tioga, Saddlebag, and Ellery Lakes under ice (Cohen, 2019; Lund, 1988).

SPECIFIC CONDUCTIVITY

Specific conductivity levels measured during 2022 and 2023 were low in Saddlebag Lake, Ellery Lake, Tioga Lake, Lee Vining Creek, and Glacier Creek (Table 6.4-8, Figure 6.4-9) (WQ-1 Final Technical Report, provided in Volume III of this DLA). Gradual changes in specific conductivity measurements were observed with reservoir depth in Tioga Lake and Saddlebag Lake. In Lee Vining Creek, specific conductivity at the inlet to Saddlebag Lake (Site LV-1) (7 to 11 microSiemens per centimeter [μS/cm]) were considerably lower than other sites (7 to 59 μS/cm).

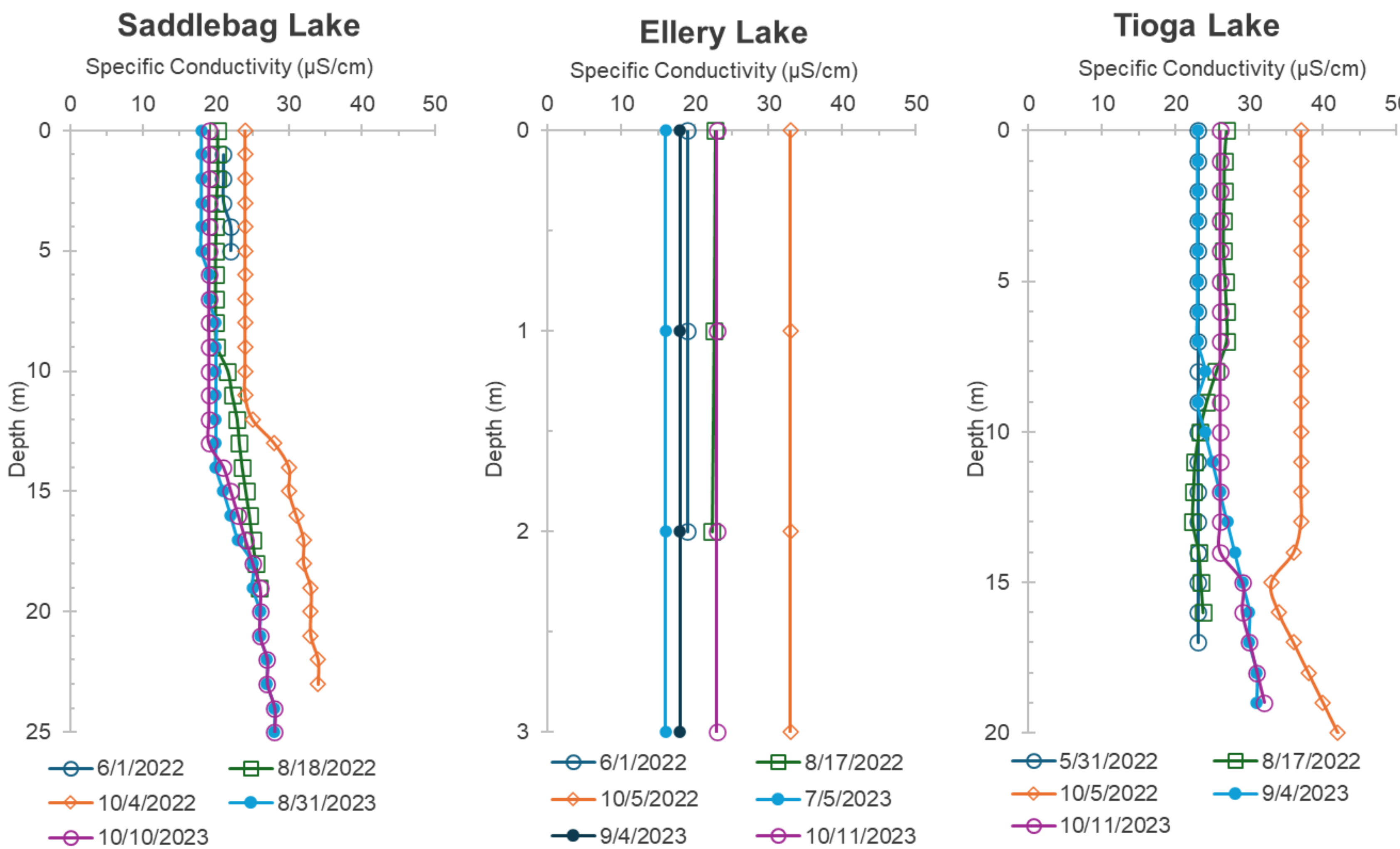


Figure 6.4-9. Specific Conductivity Profiles Collected in Project Reservoirs, 2022 and 2023.

pH

Measured pH in Project reservoirs exhibited variability during the 2022 and 2023 water quality assessment (Table 6.4-8, Figure 6.4-10) (WQ-1 Final Technical Report, provided in Volume III of this DLA). In Saddlebag Lake, during the summer (August), pH exhibited high variation in the water columns, with higher pH in the surface and lower concentrations in the bottom of the water column. During the spring and fall, pH exhibited less variation throughout the water column. In Ellery Lake, pH was similar throughout the water column. In Tioga Lake, decreases in pH were observed with depth during summer (August, September) and fall (October).

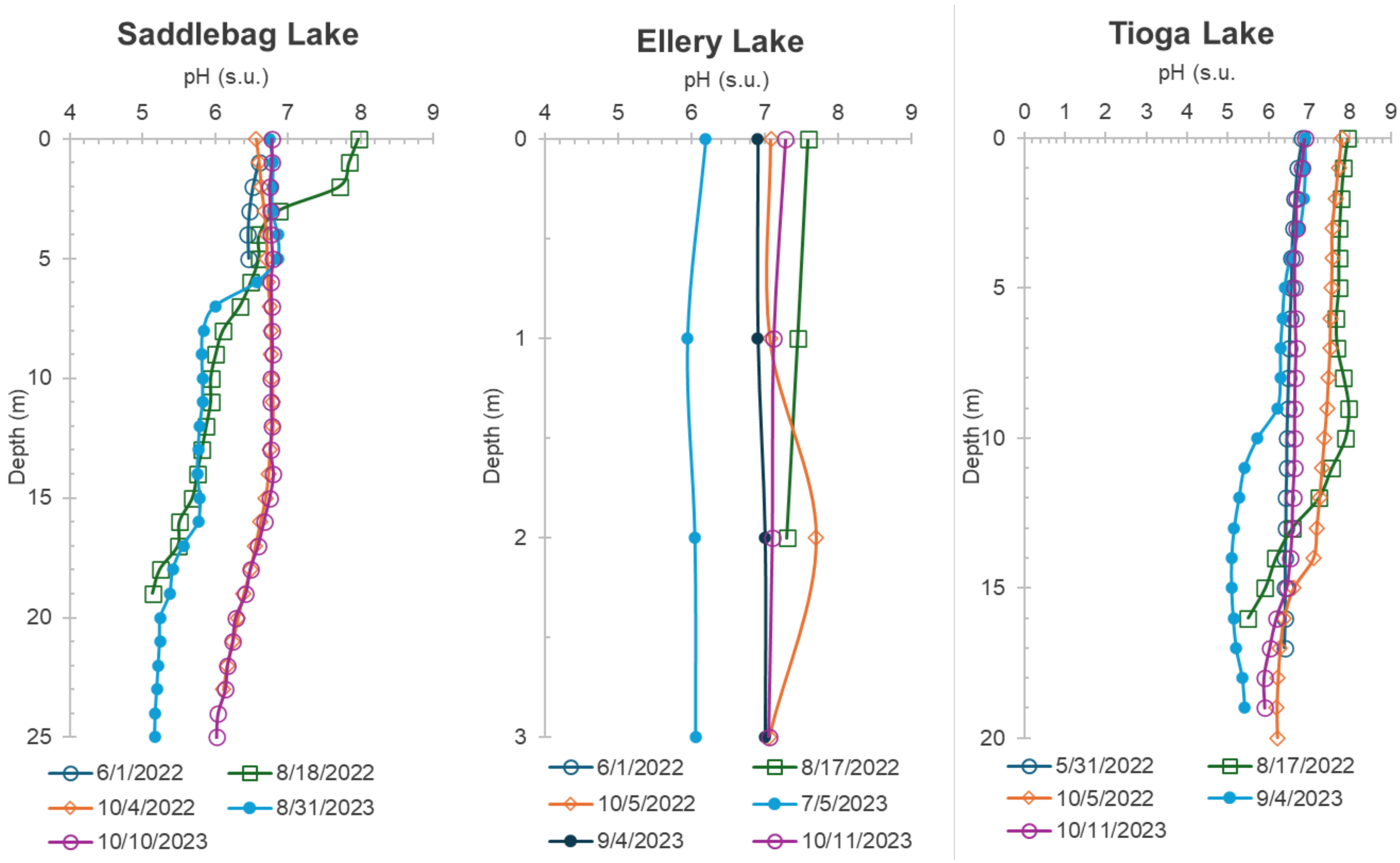


Figure 6.4-10. pH Profiles Collected in Project Reservoirs, 2022 and 2023.

Spatial and seasonal variability were observed in Lee Vining Creek and Glacier Creek during the 2022 and 2023 water quality assessment (Table 6.4-8, Figure 6.4-11) (WQ-1 Final Technical Report, provided in Volume III of this DLA). In Lee Vining Creek, pH was higher during the summer in 2023 and fall in 2024 compared to the other seasons.

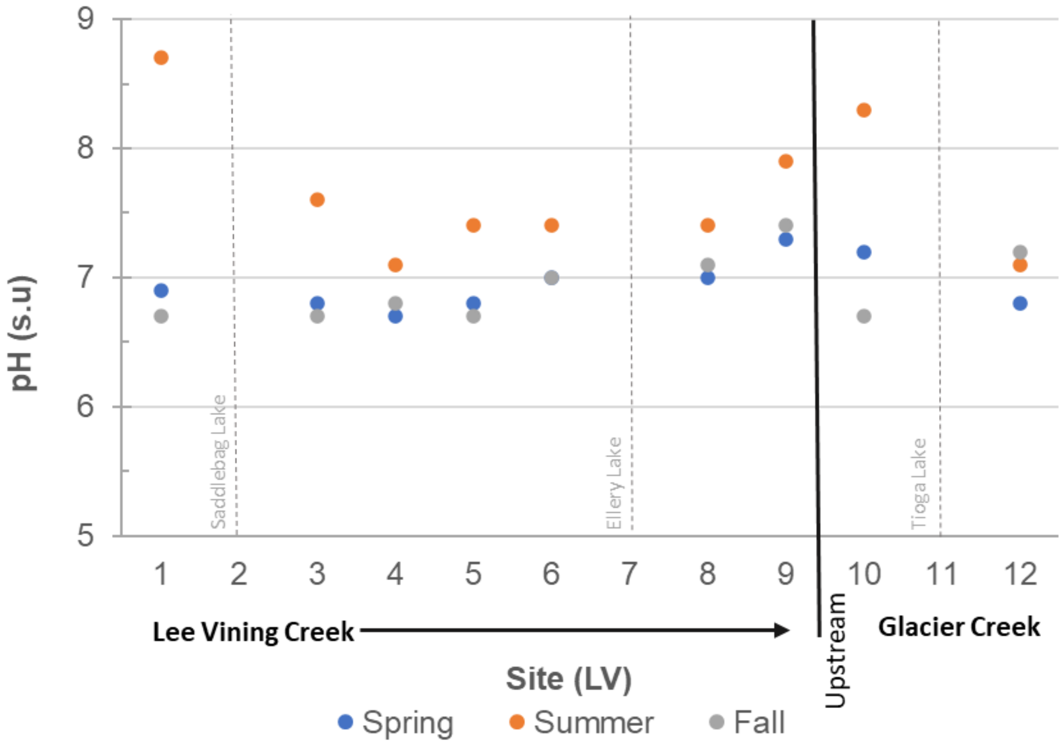


Figure 6.4-11. pH Collected in Lee Vining Creek and Glacier Creek, 2022.

Measured pH levels reflect similar patterns to data collected in Project reservoirs on seven dates in 1986 and 1987 (6.3 to 8.4; Lund, 1988) and Lee Vining Creek downstream of Poole Powerhouse on single dates in 2000, 2011, and 2019 (6.4 to 7.9; CEDEN, 2024).

<u>BIOSTIMULATORY SUBSTANCES</u>

Algal nutrients including nitrogen (i.e., nitrate+nitrite, total ammonia, total Kjeldahl nitrogen) and phosphorus species (i.e., total phosphorus, orthophosphate) concentrations in Project reservoirs and Project-affected stream reaches were low (less than 0.5 mg/L) and frequently below laboratory detection limits during the 2022 and 2023 water quality assessment (Table 6.4-9) (WQ-1 Final Technical Report, provided in Volume III of this DLA). These results are consistent with historical nutrient data (ammonia [less than 0.002 to 0.166 mg/L], nitrate [less than 0.01 to 1.41 mg/L], and orthophosphate [less than 0.009 to 0.408 mg/L]) collected in all Project reservoirs and their outlet streams between 2015 and 2017 (Cohen, 2019).

Table 6.4-9. Range (Count) of Nutrients in Grab Samples Collected 2022 and 2023

Location (Site ID)	Waterbody Type	Nitrate+Nitrite-N (mg/L)	Total Ammonia-N (mg/L)	Total Kjeldahl Nitrogen (mg/L)	Total Phosphorus (mg/L)	Orthophosphate (mg/L)
Lee Vining Creek Watershed						
Lee Vining Creek inflow to Saddlebag Lake (LV-1)	Stream	<0.055–0.12 (n=5)	<0.025–0.073 (n=5)	0.065–0.25 (n=5)	<0.023 (n=5)	<0.0051–0.04 (n=5)
Saddlebag Lake (LV-2)	Reservoir	<0.055–0.073 (n=8)	< 0.025–0.067 (n=8)	<0.040–0.34 (n=8)	<0.023 (n=8)	<0.0051–0.024 (n=8)
Lee Vining Creek between Saddlebag Dam and its confluence with Slate Creek (LV-3)	Stream	<0.055–0.075 (n=5)	<0.025–0.036 (n=5)	<0.040–0.28 (n=5)	<0.023 (n=5)	<0.0051–0.026 (n=5)
Lee Vining Creek between its confluence with Slate Creek and Glacier Creek (LV-4)	Stream	<0.055–0.078 (n=6)	<0.025–0.038 (n=6)	<0.040– 0.19 (n=6)	<0.023 (n=6)	<0.0051–0.043 (n=6)
Lee Vining Creek between its confluence with Glacier Creek and Ellery Lake (LV-5)	Stream	<0.055–0.10 (n=6)	<0.025–0.045 (n=6)	<0.040–0.46 (n=6)	<0.023 (n=6)	<0.0051–0.051 (n=6)
Lee Vining Creek inflow to Ellery Lake (LV-6)	Stream	<0.055–0.08 (n=6)	<0.025–0.044 (n=6)	<0.040–0.4 (n=6)	<0.023 (n=6)	<0.0051–0.016 (n=6)
Ellery Lake (LV-7)	Reservoir	<0.055–0.062 (n=9)	<0.025–0.040 (n=9)	<0.040–0.37 (n=9)	<0.023 (n=9)	<0.0051–0.026 (n=9)
Lee Vining Creek immediately downstream of Poole Powerhouse (LV-8)	Stream	<0.055–0.077 (n=6)	<0.025–0.044 (n=6)	<0.20–0.33 (n=6)	<0.023 (n=6)	0.0066–0.027 (n=6)
Lee Vining Creek upstream of the LADWP Diversion (LV-9)	Stream	<0.055–0.13 (n=6)	<0.025–0.037 (n=6)	0.1–0.37 (n=6)	<0.050 (n=6)	<0.0051–0.023 (n=6)
Glacier Creek Watershed						

Location (Site ID)	Waterbody Type	Nitrate+Nitrite-N (mg/L)	Total Ammonia-N (mg/L)	Total Kjeldahl Nitrogen (mg/L)	Total Phosphorus (mg/L)	Orthophosphate (mg/L)
Glacier Creek inflow to Tioga Lake (LV-10)	Stream	<0.055–0.11 (n=6)	<0.025–0.033 (n=6)	<0.040–0.25 (n=6)	<0.050 (n=6)	<0.0051–0.028 (n=6)
Tioga Lake (LV-11)	Reservoir	<0.055–0.087 (n=8)	<0.025–0.12 (n=8)	<0.040–0.31 (n=8)	<0.050 (n=8)	<0.0051–0.035 (n=8)
Glacier Creek downstream of Tioga Dam (LV-12)	Stream	<0.055–0.082 (n=6)	<0.025–0.054 (n=6)	<0.040–0.32 (n=6)	<0.023 (n=6)	<0.0051–0.034 (n=6)

ID = identification number; mg/L= milligrams per liter; N= nitrogen

TOTAL DISSOLVED SOLIDS AND TOTAL SUSPENDED SOLIDS

TDS and TSS levels measured during 2022 and 2023 were low in Saddlebag Lake, Ellery Lake, Tioga Lake, and Glacier Creek (Table 6.4-10) (WQ-1 Final Technical Report, provided in Volume III of this DLA). TDS were generally lower at sites upstream of Saddlebag Lake and Ellery Lake compared with sites downstream of Ellery Lake.

Table 6.4-10. Range (Count) of Total Dissolved Solids and Total Suspended Solids in Grab Samples Collected 2022 and 2023

Location (Site ID)	Waterbody	TDS (mg/L)	TSS (mg/L)
Lee Vining Creek Watershed			
Lee Vining Creek inflow to Saddlebag Lake (LV-1)	Stream	<5–16 (n=5)	<2–2 (n=5)
Saddlebag Lake (LV-2)	Reservoir	8–29 (n=8)	<2–3.8 (n=8)
Lee Vining Creek between Saddlebag Dam and its confluence with Slate Creek (LV-3)	Stream	13–20 (n=5)	<2 (n=5)
Lee Vining Creek between its confluence with Slate Creek and Glacier Creek (LV-4)	Stream	12–23 (n=6)	<2 (n=6)
Lee Vining Creek between its confluence with Glacier Creek and Ellery Lake (LV-5)	Stream	10–24 (n=6)	<2 (n=6)
Lee Vining Creek inflow to Ellery Lake (LV-6)	Stream	18–28 (n=6)	<2 (n=6)
Ellery Lake (LV-7)	Reservoir	12–25 (n=9)	<2 (n=9)
Lee Vining Creek immediately downstream of Poole Powerhouse (LV-8)	Stream	<10–38 (n=6)	<2 (n=6)
Lee Vining Creek upstream of the LADWP Diversion (LV-9)	Stream	14–44 (n=6)	<2–4.5 (n=6)
Glacier Creek Watershed			
Glacier Creek inflow to Tioga Lake (LV-10)	Stream	22–43 (n=6)	<2–4.0 (n=6)
Tioga Lake (LV-11)	Reservoir	17–39 (n=8)	<2–6 (n=8)
Glacier Creek downstream of Tioga Dam (LV-12)	Stream	12–35 (n=6)	<2.0a (n=6)

ID = identification number; mg/L=milligrams per liter; TDS = total dissolved solids; TSS = total suspended solids

TURBIDITY

Reservoir and Stream

Instantaneous turbidity levels measured during 2022 and 2023 were low in Saddlebag Lake, Ellery Lake, Tioga Lake, and Glacier Creek (Table 6.4-8) (see the WQ-1 Final Technical Report, provided in Volume III of this DLA). Turbidity was highest during the spring at samples collected upstream of the LADWP Diversion Dam (Site LV-9).

Lee Vining Creek Downstream of Poole Powerhouse

Turbidity in Lee Vining Creek downstream of Poole Powerhouse was highly variable throughout 2022 and 2023 monitoring periods. During July 2022, approximately 24 Hydro-resource Optimization events were evaluated. At Site LVC-DSPP1, 0.2 river mile downstream of Poole Powerhouse, baseline[2] turbidity levels of approximately 0.5 to 1 nephelometric turbidity unit (NTU) were generally observed with increases to approximately 2 NTU during periods of Hydro-resource Optimization (Figure 6.4-12; WQ-1 Final Technical Report, provided in Volume III of this DLA). At Site LVC-DSPP2, 4.3 river miles downstream of Poole Powerhouse, baseline turbidity levels of 0.5 to 1.5 NTU were observed with increases to approximately 3.5 NTU on average during periods of Hydro-resource Optimization (Figure 6.4-13; WQ-1 Final Technical Report, provided in Volume III of this DLA).

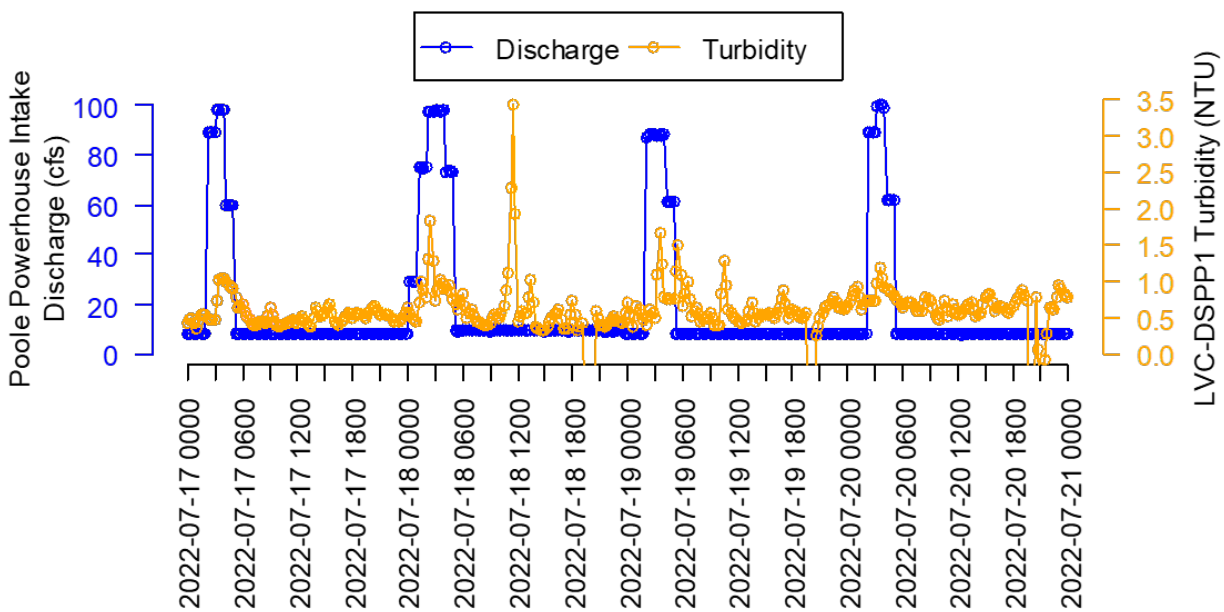


Figure 6.4-12. Continuous Turbidity Within Lee Vining Creek Downstream of Poole Powerhouse (Site LVC-DSPP1) During Hydro-resource Optimization, July 2022.

[2] Periods immediately before and after Hydro-resource Optimization events occurred.

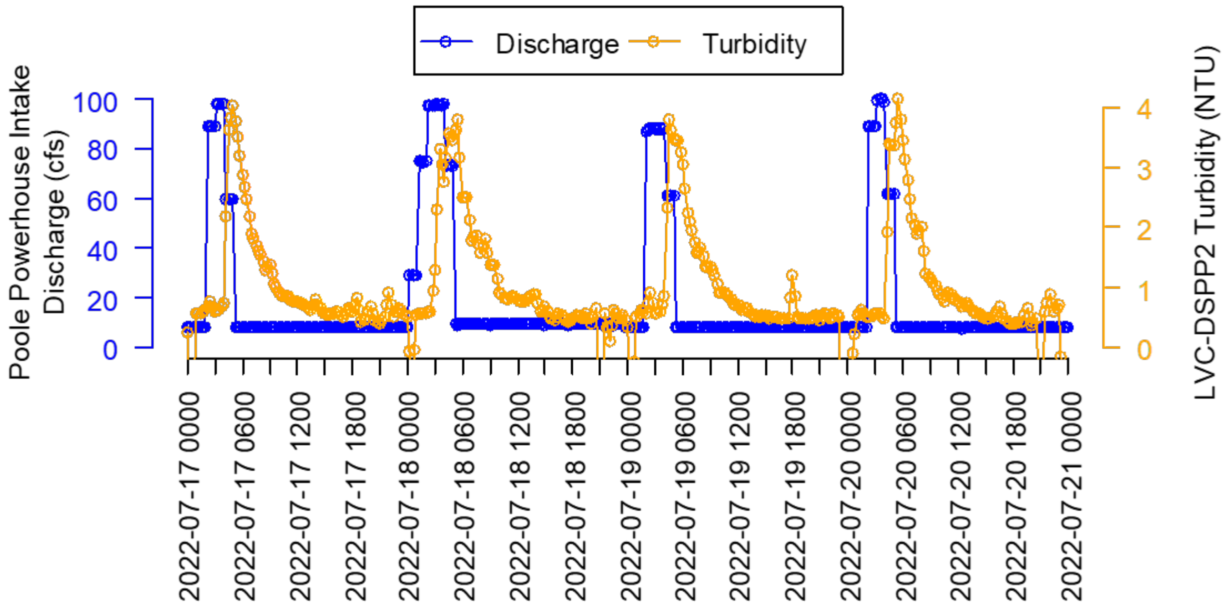


Figure 6.4-13. Continuous Turbidity Within Lee Vining Creek Near Lee Vining Campground (Site LVC-DSPP2) During Hydro-resource Optimization, July 2022.

During 2023, prolonged periods of high flows and high turbidity were observed in Lee Vining Creek downstream of Poole Powerhouse. At Site LVC-DSPP1, turbidity ranged from approximately 0 to 50 NTU, with peak turbidity occurring in June (Figure 6.4-14; WQ-1 Final Technical Report, provided in Volume III of this DLA). At Site LVC-DSPP2, turbidity ranged from approximately 0 to 100 NTU, with peak turbidity occurring in June and July (Figure 6.4-15; WQ-1 Final Technical Report, provided in Volume III of this DLA).

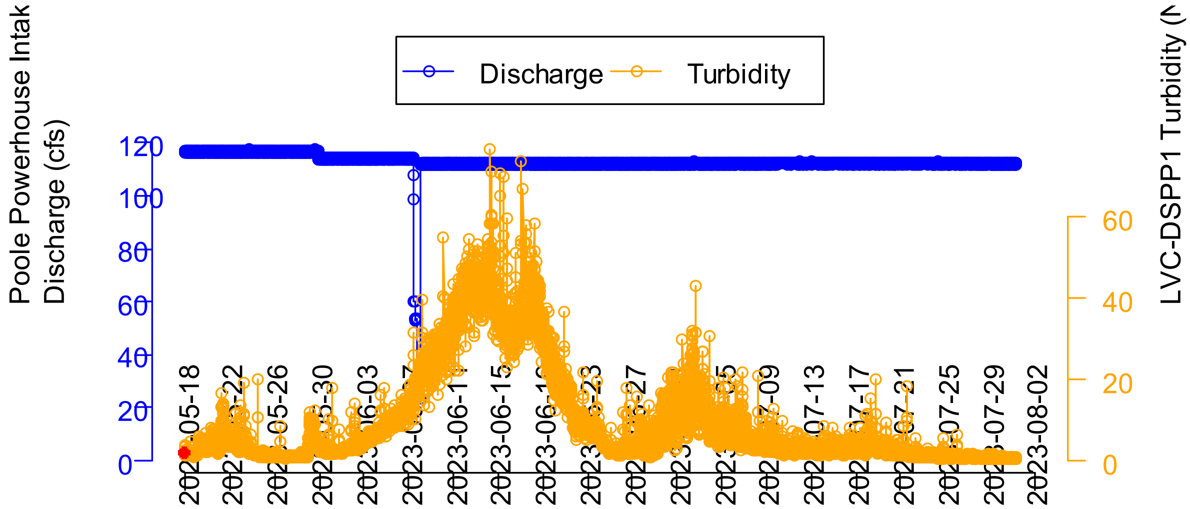


Figure 6.4-14. Turbidity in Lee Vining Creek Downstream of Poole Powerhouse (Site LVC-DSPP1) During Run-off Events Between May and Early August 2023.

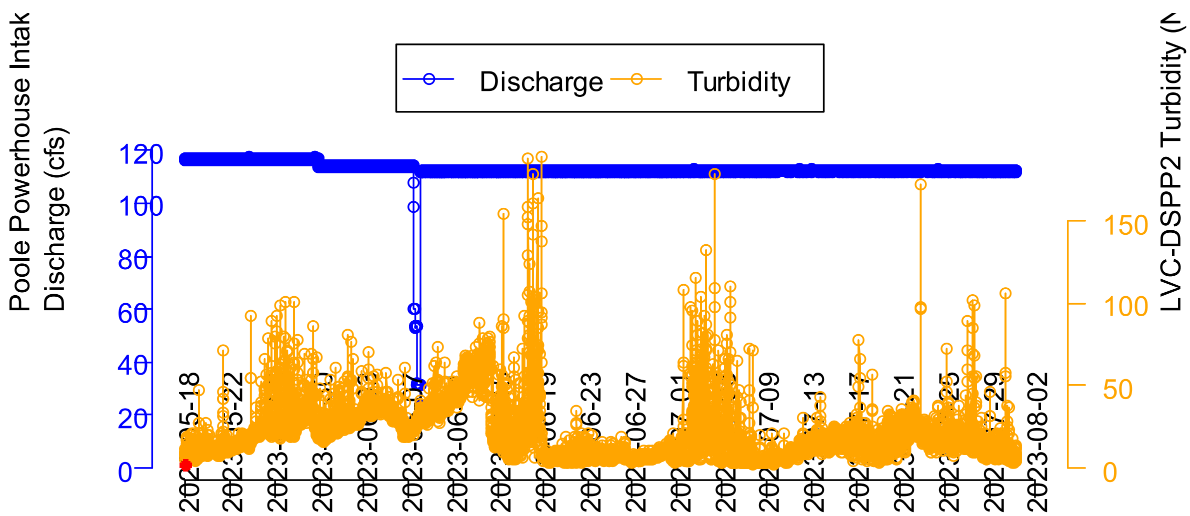


Figure 6.4-15. Turbidity in Lee Vining Creek Near Lee Vining Campground (Site LVC-DSPP2) During Run-off Events Between May and Early August 2023.

Natural background turbidity varied seasonally during 2023. All background monitoring locations (Site LVC-WCT, Site LV-SIT, and Site LV-GCT) were generally characterized by elevated turbidity and high run-off conditions during the July and August, followed by uniformly lower turbidity levels during October as snowmelt run-off receded (Figure 6.4-16). Turbidity in Warren Creek (Site LV-WCT) during July generally ranged from 100 to 150 NTU and temporarily exceeded 400 NTU; during August, turbidity varied from 5 to 13 NTU; and during October, turbidity ranged from 0 to 1 NTU. Turbidity measured in the Lee Vining Creek inflow to Saddlebag Lake (Site LV-SIT) during July was generally low (0 to 1 NTU); during August,[3] turbidity varied from 0 to 30 NTU; and during October, turbidity returned to very low levels (0 to 1 NTU). Turbidity measured in Glacier Creek inflow to Tioga Lake (Site LV-GCT) was generally lower than the other monitoring sites, with turbidity ranging from 0 to 4 NTU, 0 to 12 NTU, and 0 to 1 NTU during July, August, and October, respectively.

[3] Data are qualified due to potential equipment malfunction and/or equipment fouling. Difference between turbidity readings and spot checks measurements indicate fouling.

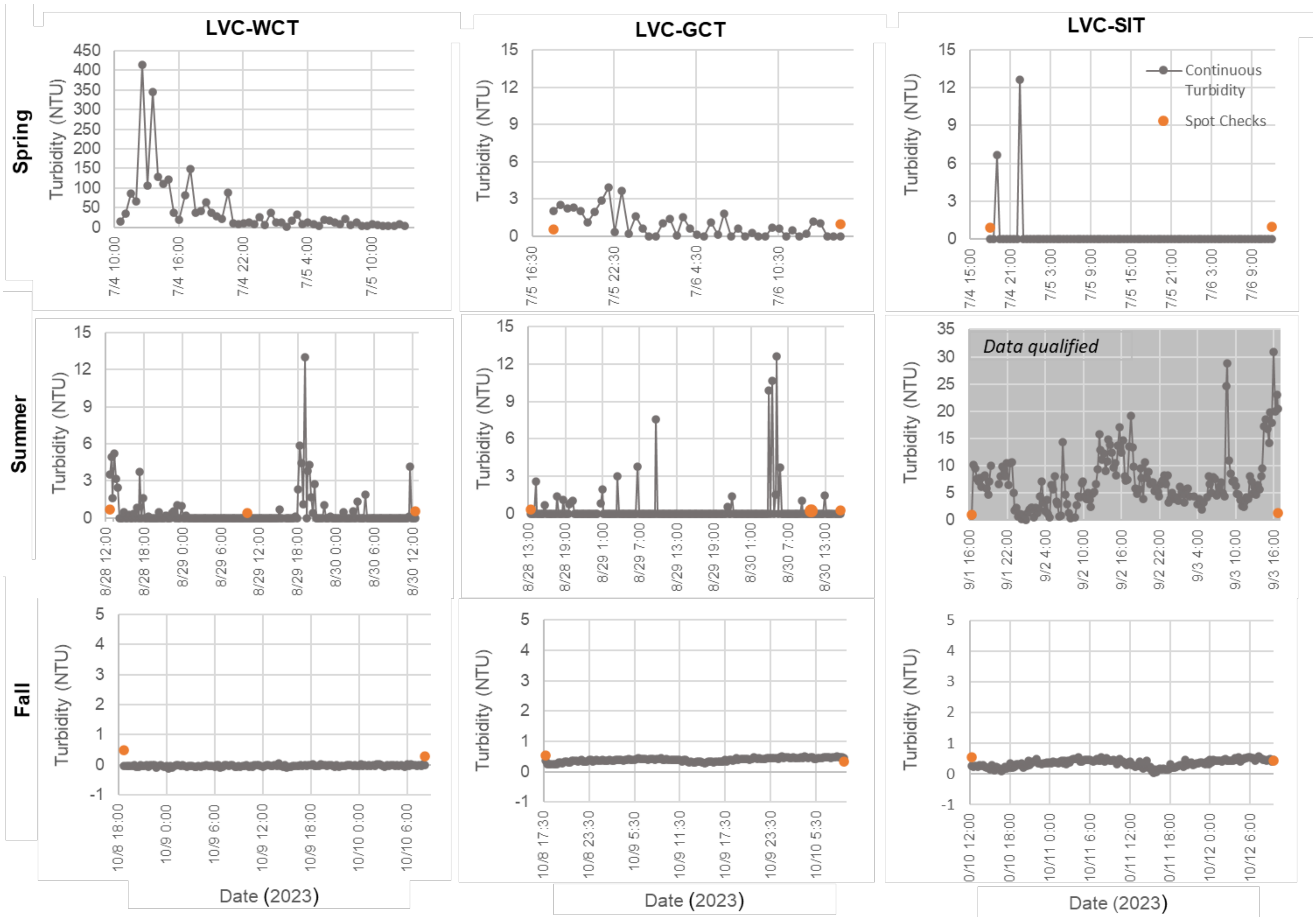


Figure 6.4-16. Background Turbidity in Lee Vining Creek Tributaries, 2023.

Bacteria

Saddlebag Lake, Ellery Lake, and Tioga Lake showed low levels of *Escherichia coli* and fecal coliform. E. coli collected during 2023 (six dates between August 24 and September 26) were less than the practical quantification limit (PQL) (1.8 most probable number [MPN]/100 mL) in all samples collected (WQ-1 Final Technical Report, provided in Volume III of this DLA).

Fecal coliform densities collected during 2022 (five dates between September 15 and October 5) were less than or equal to 20 colony forming units (cfu) per 100 milliliters (mL), except for samples collected at all sites on September 15, 2022 (49 to 350 MPN/100 mL) (WQ-1 Final Technical Report, provided in Volume III of this DLA). The log mean of bacterial density for the five replicate samples ranged from 4 cfu/100 mL (Site LV-B2) to 6.9 cfu/100 mL (Site LV-B3). Fecal coliform collected during 2023 (six dates between August 24 and September 26) were less than the PQL (1.8 MPN/100 mL) in all samples collected (WQ-1 Final Technical Report, provided in Volume III of this DLA). These data are consistent with historical fecal coliform data collected immediately downstream of Poole Powerhouse between 2012 to 2013 (less than 1 to 2 cfu/100 mL) and upstream of the LADWP diversion from 2011 to 2015 (1 to 18 cfu/100 mL) (CEDEN, 2024).

Mercury

Fish of edible size were collected (n=42) from Saddlebag, Tioga, and Ellery Lakes and analyzed for total mercury in August 2022. Three species were captured: brown trout (*Salmo trutta*), rainbow trout (*Oncorhynchus mykiss*), and brook trout (*Salvelinus fontinalis*). Details of all fish captured are presented in the *Reservoir Fish Population (AQ-1) Final Technical Report* (provided in Volume III of this DLA) and summarized in the WQ-1 Final Technical Report, provided in Volume III of this DLA. Mercury in fish tissue and physical characteristics of fish captured in Project reservoirs are summarized in Table 6.4-11. Mercury concentrations and physical characteristic (i.e., total length, fork length, and weight) results by individual fish are tabulated in the WQ-1 Final Technical Report, provided in Volume III of this DLA.

Mercury concentrations in fish tissue were lowest in Ellery Lake and greatest in Saddlebag Lake (Table 6.4-11). Mercury concentrations in all sizes of brook trout, brown trout, and rainbow trout were low (0.009 to 0.022 microgram per gram wet weight [µg/g ww]) in Ellery Lake. In Tioga Lake, mercury concentrations in brook trout were generally greater than in rainbow trout. In Saddlebag and Tioga Lakes, mercury concentrations in brook trout generally increased when the total length of fish was longer. The highest mercury concentrations were measured in large brook trout captured in Tioga Lake and Saddlebag Lake.

Table 6.4-11. Summary of Mercury in Fish Tissue and Physical Characteristics of Fish Analyzed in Project Reservoirs, August 2022

Reservoir	Trout Species	Total Number of Fish	Total Mercury (µg/g ww)		Total Length (mm)	
			Mean	Range	Mean	Range
Saddlebag Lake	Brook	9	0.121	0.028–0.308	291	265–334
	All	*9*	*0.121*	*0.028–0.308*	*291*	*265–334*
Tioga Lake	Brook	9	0.062	0.034–0.093	248	218–275
	Rainbow	8	0.048	0.041–0.065	317	234–440
	All	*17*	*0.056*	*0.034–0.093*	*280*	*218–440*
Ellery Lake	Brook	5	0.013	0.009–0.016	293	253–324
	Brown	9	0.017	0.014–0.022	272	205–300
	Rainbow	2	0.016	0.012–0.020	268	235–301
	All	*16*	*0.015*	*0.009–0.022*	*278*	*205–324*
All Reservoirs	*All*	*42*	*0.054*	*0.009–0.308*	*282*	*205–440*

µg/g ww = microgram per gram wet weight; mm = millimeter

6.4.2. Potential Adverse Effects and Issues

6.4.2.1. Effects of Project Operations and Maintenance on Water Quality in Project Reservoirs and Project-Affected Stream Reaches

Project O&M have the potential to affect the following Basin Plan (LRWQCB, 2019) water quality objectives: ammonia, bacteria, biostimulatory substances, chemical constituents, chlorine, color, DO, floating material, oil and grease, non-degradation of aquatic communities and populations, pH, radioactivity, sediment, sport fish, settleable materials, suspended materials, tastes and odors, temperature, toxicity, and turbidity.

Existing environmental measures include implementation of an erosion control plan (SCE, 1997a), spoils disposal plan (SCE, 1997b), and hazardous substances plan (SCE, 1997c). These measures minimize or avoid potential adverse effects on water quality (e.g., sediment, settleable materials, suspended materials, and oil and grease). Consistency with Basin Plan objectives and potential Project effects are described in detail below. The potential for Project reservoirs to methylate mercury that can bioaccumulate in fish and pose a health risk to humans that consume them is described in Section 6.5, *Fish and Aquatic Resources*. The potential for Hydro-resource Optimization flows to affect turbidity downstream of Poole Powerhouse is described in Section 6.4.2.3, (*Consistency with Current Resource Management Objectives*) Turbidity.

NO ACTION

Under the No Action, SCE would continue to operate and maintain the Project in accordance with the terms and conditions of the existing FERC license. Relative to existing conditions, ongoing Project operations would have no adverse effects on the following water quality objectives supporting existing beneficial uses: ammonia, bacteria, biostimulatory substances, chemical constituents, chlorine, color, DO, floating material, oil and grease, non-degradation of aquatic communities and populations, pH, radioactivity, sediment, settleable materials, sport fish, suspended materials, tastes and odors, temperature, toxicity, and turbidity.

PROPOSED ACTION

Based on the analysis discussed above, the results of the studies, and because the Proposed Action does not include changes to O&M activities, no adverse effects have been identified for Proposed Action.

6.4.2.2. Bioaccumulation of Mercury in Fish Tissue and Potential Consumption Guidelines to Avoid Human Health Risks in Project Reservoirs

The mercury concentration in fish tissue depends on several factors, including the presence of organic matter and reduction of oxygen, which affect microbial transformation of elemental mercury (Hg^0/Hg^{II}) into methylmercury; exposure of invertebrates and other prey items to methylmercury; and the food web position (i.e., trophic level), size, and age of the fish.

The Project does not directly release or mobilize mercury in Project reservoirs; however, conditions in Saddlebag Lake and Tioga Lake have the potential to methylate mercury. In these Project reservoirs, two potential pathways for mercury methylation include (1) exposed bed shoreline and sediments reservoir drawdowns (see DLA Exhibit A), and (2) the presence of low DO (DO, less than 1 mg/L) at the sediment-water interface (see Section 6.4.1.7, [*Water Quality*] Dissolved Oxygen).The conditions in Ellery Lake are less likely to provide a pathway for methylation because it is shallow and existing information shows DO is generally saturated at the sediment-water interface (see Section 6.4.1.7, [*Water Quality*] Dissolved Oxygen).

Evidence of fish mercury bioaccumulation was found in edible-sized fish in the Project reservoirs during 2022 surveys. Mercury concentrations in fish tissue were generally higher in Saddlebag Lake and Tioga Lake compared to Ellery Lake (Figure 6.4-17). Large (greater than 250 mm) brook trout collected from Saddlebag and Tioga Lakes contained the highest mercury levels and exceeded the 0.08 µg/g Office of Environmental Health Hazard Assessment (OEHHA) screening value (SV). The exceedance of the OEHHA SV suggests that consumption of recreationally caught fish from Saddlebag Lake and Tioga Lake may pose potential health risks to humans that consume them.

Comparison to the Basin Plan Sport Fish Water Quality Objects is described in Section 6.4.2.3 (*Consistency with Current Resource Management Objectives*), Sport Fish.

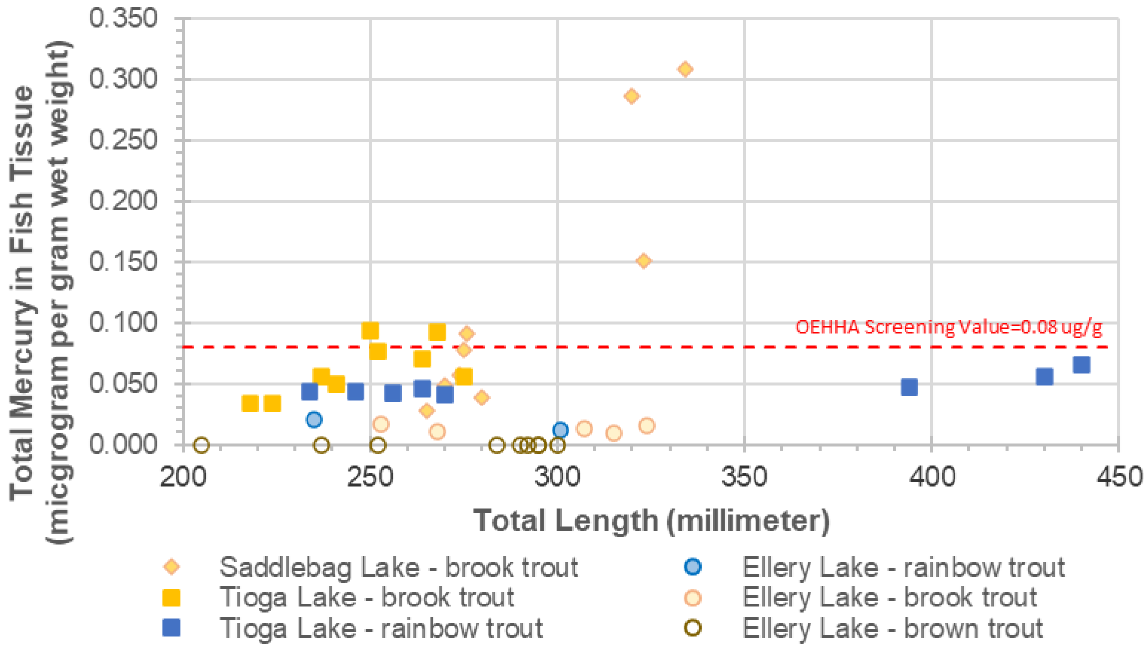


Figure 6.4-17. Mercury in Individual Fish Tissue by Total Length Compared to the Office of Environmental Health Hazard Assessment Screening Value.

When mercury concentrations in fish tissues exceed 0.08 µg/g, OEHHA issues fish consumption guidelines that recommend how often populations can safely eat fish caught from a waterbody (Lloyd and Denton, 2005). Separate guidelines are created for two groups: (1) women 18 to 45 years and children 1 to 17 years and (2) women over 50 years and men over 18 years (OEHHA, 2008). One component of the guideline includes comparison of a weighted arithmetic mean (1x10-4 milligrams per kilogram per day for Population 1 and 3x10-4 milligrams per kilogram per day for Population 2) or other descriptive statistics for mercury for the selected fish species to the chemical concentrations with the OEHHA Advisory Tissue Levels (ATLs) for each chemical of potential concern (OEHHA, 2008). The ATLs incorporate the toxicity of the chemical and potential benefits of eating fish to determine the maximum number of servings (0 to 7) per week that are considered acceptable for each population (OEHHA, 2008).

The recommended consumption frequency of trout species in Project reservoirs was determined by comparing the mean total mercury levels in fish tissue in Project reservoirs to the OEHHA ATLs (Table 6.4-12). Although there are consumption limits on some fish species in Saddlebag Lake and Tioga Lake, the consumption frequency for Project reservoirs is higher (more servings per week) than the OEHHA California statewide advisory for eating fish from California's Lakes and Reservoirs without site-specific advice (OEHHA, 2021).

Table 6.4-12. Recommended Maximum Number of Servings per Week for Fish from Lee Vining Reservoirs and California Lakes and Reservoirs without Site-Specific Advice

Reservoir	Trout Species	2022 Study Results		Consumption Frequency (servings/week)	
		Total Number of Fish	Mean Total Mercury (parts per billion wet weight)	Women 50+ and Men 18+ years	Women 18–49 and Children 1–17 years
Ellery Lake	Brook	5	13	7	7
	Brown	9	17	7	7
	Rainbow	2	16	7	7
Saddlebag Lake	Brook	9	121	5	2
Tioga Lake	Brook	9	62	7	3
	Rainbow	8	48	7	4
California Lakes and Reservoirs[1]	Brook	--	--	--	--
	Brown	--	--	1	3
	Rainbow	--	--	2	4

Source: OEHHA, 2008, 2021

-- = no data/not applicable

NO ACTION

Under the No Action, SCE would continue to operate and maintain the Project in accordance with the terms and conditions of the existing FERC license. The Project does not directly release mercury into Project reservoirs, and Project operations under the No Action would not contribute to increased mercury level in fish tissue. However, the risk to public health by consuming trout from Saddlebag and Tioga Lakes would remain.

PROPOSED ACTION

Based on the analysis discussed above, the results of the aquatics studies, and because the Proposed Action does not include changes to O&M activities, no adverse effects have been identified for Proposed Action.

6.4.2.3. Consistency with Current Resource Management Objectives (Forest Plans, Basin Plan, etc.)

INYO NATIONAL FOREST LAND MANAGEMENT PLAN

Chapter 2 of the 2019 Inyo National Forest LMP (USFS, 2019) describes forest-wide conditions and management direction for watersheds. This direction applies across all lands of the forest, including desired conditions, objectives, goals, standards, guidelines, and potential management approaches. Using the results obtained from Project technical reports, SCE assessed the watershed against the desired future conditions stated in Chapter 2 (USFS, 2019).

Desired conditions for watersheds, with which the Project is consistent under both the No Action and the Proposed Action, include (USFS, 2019):

- WTR-FW-DC 01: Adequate quantity and timing of water flows support ecological structure and functions, including aquatic species diversity and riparian vegetation. Watersheds are resilient to changes in air temperatures, snowpack, timing of run-off, and other effects of climate change.

- WTR-FW-DC 02: water quality supports state-designated beneficial uses of water. Water quality is sustained at a level that retains the biological, physical, and chemical integrity of aquatic systems and benefits the survival, growth, reproduction, and migration of native aquatic and riparian species.

- WTR-FW-DC 03: Watersheds are fully functioning or trending toward fully functioning and resilient; recover from natural and human disturbances at a rate appropriate with the capability of the site; and have a high degree of hydrologic connectivity laterally across the floodplain and valley bottom and vertically between surface and subsurface flows. Physical (geomorphic, hydrologic) connectivity and associated surface processes (such as run-off, flooding, in-stream flow regime, erosion, and sedimentation) are maintained and restored. Watersheds provide important ecosystem services such as high-quality water, recharge of streams and shallow groundwater, and maintenance of riparian communities. Watersheds sustain long-term soil productivity.

- WTR-FW-DC 04: Soil and vegetation functions in upland and riparian areas are sustained and resilient. Healthy soils provide the base for resilient landscapes and nutritive forage for browsing and grazing animals, and support timber production. Healthy upland and riparian areas support healthy fish and wildlife populations, enhance recreation opportunities, and maintain water quality.

- WTR-FW-DC 06: The sediment regime within waterbodies is within the natural range of variation. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage and transport.

No adverse effects have been identified for the No Action or the Proposed Action with regard to LMP desired conditions.

<u>LAHONTAN REGION WATER QUALITY CONTROL BOARD BASIN PLAN</u>

The goal of the WQ-1 Study was to review whether the Project is consistent with the water quality objectives described in the 2019 Basin Plan (LRWQCB, 2019). SCE observed no inconsistencies for 16 of the 20 applicable Basin Plan water quality objectives, including: (1) ammonia, (2) bacteria, (3) biostimulatory substances, (4) chemical constituents, (5) chlorine, (6) color, (7) floating material, (8) oil and grease, (9) non-degradation of aquatic communities and populations, (10) radioactivity, (11) sediment, (12) sport fish, (13) settleable materials, (14) suspended materials, (15) tastes and odors, and (16) turbidity (Table 6.4-13).

Some inconsistencies with applicable Basin Plan water quality objectives were observed for four Basin Plan water quality objectives, including: (1) DO, (2) pH, (3) temperature, and (4) toxicity. Inconsistencies with Basin Plan water quality objectives for DO, pH, temperature, and toxicity are naturally occurring and not associated with the Project.

Therefore, under both the No Action and the Proposed Action, no adverse effects are anticipated with regard to Basin Plan objectives.

Table 6.4-13. Summary of 2022 and 2023 Water Quality Results and Comparison to Basin Plan Numeric Surface Water Quality Objectives

Analyte	Units	Year	Analyte Concentration				Basin Plan		
			min	max	mean	n	Numeric Water Quality Objectives [a]	Frequency of Exceedances [b]	Location(s) of Numeric Water Quality Objective Exceedances
In Situ Measurements									
Temperature	°C	2022	1.9	18.4	10	143	--	--	--
		2023	2.5	13.4	7.5	141		--	--
Specific conductance	µS/cm	2022	8	59	27	143	<900 µS/cm (maximum)	0/143	None
		2023	7	49	23	141		0/141	None
pH	s.u.	2022	5.1	8.7	6.9	143	<0.5 s.u. change in normal ambient pH levels	2/9[c]	• Lee Vining Creek inflow to (LV-1) to Saddlebag Lake and downstream of Saddlebag Dam (LV-3) (summer) • Glacier Creek inflow to Tioga Lake (LV-10) and downstream of Tioga Dam (LV-12) (summer)
		2023	5.1	7.6	6.3	141		1/8[c]	Lee Vining Creek inflow to (LV-1) to Saddlebag Lake and downstream of Saddlebag Dam (LV-3) (summer)
DO	%	2022	0	124	94	143	>80% saturation (minimum)	4/6[d]	• Saddlebag Lake (LV-2) hypolimnion • Tioga Lake (LV-11) hypolimnion
		2023	3.9	121	87	141		4/4[d]	• Saddlebag Lake (LV-2) hypolimnion • Tioga Lake (LV-11) hypolimnion

Analyte	Units	Year	Analyte Concentration				Basin Plan		
			min	max	mean	n	Numeric Water Quality Objectives [a]	Frequency of Exceedances [b]	Location(s) of Numeric Water Quality Objective Exceedances
DO (continued)	mg/L	2022	0.01	10.0	7.3	143	>8 mg/L (minimum)	92/143	• Saddlebag Lake (LV-2) • Tioga Lake (LV-11) • Lee Vining Creek (LV-1, LV-3, LV-4, LV-5, LV-6, LV-8) • Ellery Lake (LV-7) • Glacier Creek (LV-10, LV-12)
		2023	0.3	10.9	7.1	141		88/141	• Saddlebag Lake (LV-2) • Tioga Lake (LV-11) • Lee Vining Creek (LV-1, LV-3, LV-6) • Glacier Creek (LV-12)
Basic Water Quality									
TDS	mg/L	2022	5	44	22	38	<500 mg/L (maximum)	0/38	None
		2023	<5	37	18	38		0/38	None
TSS	mg/L	2022	<2	2	<2[e]		--	--	--
		2023	<2	6	<2[e]			--	--
Nutrients									
Total ammonia	mg/L	2022	<0.023	0.089	0.03[e]	38	CMC: 1.4–35 mg TAN/L	0/38	None
		2023	<0.025	0.120	0.023[e]	38		0/38	None
Nitrate-nitrite	mg/L	2022	<0.055	0.24	0.06[e]	38	<10 mg-N/L (maximum)	0/38	None
		2023	<0.055	0.160	0.043	38		0/38	None
	mg/L	2022	<0.040	0.46	0.2[e]	38	--	--	--

Analyte	Units	Year	Analyte Concentration				Basin Plan		
			min	max	mean	n	Numeric Water Quality Objectives [a]	Frequency of Exceedances [b]	Location(s) of Numeric Water Quality Objective Exceedances
Total Kjeldahl nitrogen		2023	<0.040	0.310	0.11[e]	38		--	--
Orthophosphate	mg/L	2022	<0.005	0.051	0.04[e]	38	--	--	--
		2023	<0.005	0.040	0.009[e]	38			
Total phosphorus	mg/L	2022	<0.023	<0.023	<0.023	38	--	--	--
		2023	<0.023	<0.023	<0.023	38		--	
Bacteria									
Fecal coliform	cfu/ 100 mL	2022	<2	540	--	15	--	--	--
		2023	<1.8	2	--	18		--	--
Escherichia coli	MPN/ 100 mL	2023	<1.8	<1.8	0.9 (log mean)	15	Geometric mean of <100 cfu/100 mL in 5 samples over 30 days	0/15	--
Turbidity During Hydro-resource Optimization Downstream of Poole Powerhouse[f]									
Turbidity	NTU	July 2022	0	21.3[g]	1.0[h]	846	<10% increase compared with natural (baseline) levels	0/24[i]	

-- = measurements not collected/no data; % = percent; µS/cm = microSiemens per centimeter; °C = degrees Celsius; cfu/100 mL = number of colony forming units per 100 milliliters; CMC = criterion maximum concentrations; DO = dissolved oxygen; mg/L = milligrams per liter; mg-N/L = milligrams nitrogen per liter; mg TAN/L = milligrams total ammonia nitrogen per liter; MPN/100 mL = most probable number per 100 milliliters; NTU = nephelometric turbidity units; s.u. = standard units; TDS = total dissolved solids; TSS = total suspended solids

[a] See Table 6.4-7 for additional details on Basin Plan water quality objectives.

[b] The number of samples collected that exceeded the numerical objective / total number of samples or sets of samples.

[c] The numerical objective was compared with differences of pH concentrations upstream and downstream of Project reservoirs.

[d] Comparison is to the number of reservoir profiles collected in Saddlebag Lake and Tioga Lake that included measurements less than 80 percent saturation. All measurements in Ellery Lake, Lee Vining Creek, and Glacier Creek were greater than 80 percent saturation.

[e] For samples that results were less than detection limit, values that were half of the laboratory detection limit were used for analysis.
[f] Hydro-resource Optimization occurred in 2022; data in July 2022 were qualified during data review and quality assessment.
[g] Represents the maximum turbidity observed during July 2023 Hydro-resource Optimization events. Peak turbidity averaged 3.1 NTU during these events.
[h] Represents the average turbidity during July 2023 baseline conditions prior to Hydro-resource Optimization events.
[i] Frequency of exceedances were not analyzed for instantaneous data.

Ammonia

Basin Plan aquatic toxicity objectives for ammonia are based on acute, 1-hour average concentration of un-ionized ammonia or total ammonia nitrogen concentrations (LRWQCB, 2019). During 2022 and 2023, total ammonia concentrations were generally low in reservoirs and streams (less than 0.025 to 0.12 mg/L) (Table 6.4-9) and were well below the aquatic numerical toxicity objectives (criterion maximum concentrations = 1.2 to 35 milligrams total ammonia nitrogen per liter) associated with ambient water temperatures (1.9 to 18.4 °C) and pH (5.1 to 8.7 standard units) measured in 2022 (USEPA, 2013). These results are consistent with historical data for the Project (SCE, 2021). No exceedances of ammonia toxicity thresholds were observed in Project reservoirs or Project-affected reaches of Lee Vining Creek and Glacier Creek (Table 6.4-13).

Bacteria

The statewide numerical water quality objective for bacteria is a 6-week rolling geometric mean of *E. coli* less than 100 cfu/100 mL, calculated weekly, and a Statistical Threshold Value of 320 cfu/100 mL not to be exceeded by more than 10 percent of the samples collected in a calendar month, calculated in a static manner. Saddlebag Lake, Ellery Lake, and Tioga Lake showed low levels of *E. coli* during the sampling period between August 24 and September 26, 2023. *E. coli* values were less than the PQL (1.8 MPN/100 mL[4]) in all samples collected. Based on current information, the Project has no effect on bacteria and no exceedances of bacteria (i.e., *E. coli*) numerical objectives were observed in Project reservoirs (Table 6.4-13).

Biostimulatory Substances

The Basin Plan does not contain specific numerical water quality objectives for nutrients but specifies waterbodies shall not contain biostimulatory substances in concentrations that promote aquatic growths to the extent that such growths cause nuisance or adversely affect the water for beneficial uses. SCE's compilation and review of data for the PAD revealed no instances where algal blooms or decreased water quality have been reported as a nuisance in Project reservoirs. Project operations do have the potential to affect populations of invasive aquatic algae in Project-affected stream reaches. Didymo (*Didymosphenia geminata)*, an invasive algal species, was historically observed in Project-affected stream reaches (Rost and Fritsen, 2014); however, the Aquatic Invasive Plants (AQ-4) Study did not observe Didymo in any Project-affected stream reaches during 2023 (Section 6.5, *Fish and Aquatic Resources*).

Algal nutrients including nitrogen (i.e., nitrate+nitrite, total ammonia, total Kjeldahl nitrogen) and phosphorus species (i.e., total phosphorus, orthophosphate) concentrations in Project reservoirs and Project-affected stream reaches were low (less than 0.5 mg/L) during the 2022 and 2023 water quality assessment (Table 6.4-9). These results are consistent with historical data, which found nutrient concentrations (i.e.,

[4] For analysis, 1.8 MPN/100 mL is equivalent to 1.8 cfu/100 mL.

ammonia, nitrate, and orthophosphate) near or below laboratory detection limits (Cohen, 2019; SCE, 2021). Based on the lack of observable nuisance growth conditions and the low concentrations of nutrients found during the 2022 and 2023 water quality assessment, biostimulatory substances were not present in sufficient quantities to cause nuisance conditions related to algal blooms or decreased water clarity and are suitable for COLD and SPWN aquatic beneficial uses.[5]

Chemical Constituents

The Basin Plan states waters designated as MUN shall not contain concentrations of chemical constituents in excess of Maximum Contaminant Level or Secondary Maximum Contaminant Level based upon Title 22 of the California Code of Regulations; and shall not contain concentrations of chemical constituents in amounts that adversely affect beneficial uses. Because the Project does not discharge waters that contain minerals or trace metals that would result in concentrations in excess of the applicable Title 22 Maximum Contaminant Level, numerical objectives from Title 22 of the California Code of Regulations for nitrate and nitrite (10 mg/L), conductivity (900 mg/L), and TDS (500 mg/L) were used for this evaluation (22 California Code of Regulations 64449).

During the 2022 and 2023 water quality assessment, nitrate and nitrite (less than 0.055 to 0.24 mg/L) (Table 6.4-9), TDS (less than 5 to 44 mg/L) (Table 6.4-10), and conductivity (9 to 59 µS/cm) (Table 6.4-8 and Figure 6.4-9) concentrations were low in Project reservoirs and Project-affected stream reaches and did not exceed the Basin Plan objectives (Table 6.4-13). These results are consistent with historical data for the Project (SCE, 2021).

Chlorine

The Basin Plan states waters shall not exceed either a median of 0.002 mg/L or maximum of 0.003 mg/L. The Project does not release chlorine into Project waterbodies. SCE's compilation and review of data for the PAD revealed no instances of chlorine in Project reservoirs and Project-affected reaches of Lee Vining Creek and Glacier Creek exceeding the Basin Plan objective.

[5] Beneficial uses established by the Basin Plan for Project waters relevant to water quality include municipal and domestic supply (MUN); hydropower generation (POW); navigation (NAV); water contact recreation (REC-1); water non-contact recreation (REC-2); cold freshwater habitat (COLD); commercial and sport fishing (COMM); wildlife habitat (WILD); and spawning (SPWN), reproduction, and/or early development (LRWQCB, 2019). Additional beneficial uses listed in the Basin Plan include groundwater recharge (GWR) and freshwater replenishment (FRSH).

Color

The Basin Plan states waters shall be free of coloration that causes nuisance conditions or other adverse effects upon beneficial uses. SCE's compilation and review of data for the PAD revealed no instances in which color in Project reservoirs and Project-affected reaches of Lee Vining Creek and Glacier Creek was a nuisance or adversely affected beneficial uses.

Dissolved Oxygen

The Basin Plan states that DO concentration as percent saturation shall not be depressed by more than 10 percent, nor shall the minimum DO concentration be less than 80 percent of saturation. DO percent saturation measurements in the bottom waters (i.e., hypolimnion) of Saddlebag and Tioga Lakes were less than 80 percent saturation during summer and fall in 2022 and 2023 (Figure 6.4-6). In reservoirs, DO in the hypolimnion may be depressed due to microbial decomposition of algal detritus originating in surface waters (i.e., epilimnion), as well as algal and bacterial respiration at depth. Hypolimnetic depletion of oxygen in reservoirs is a naturally occurring phenomenon in most temperate lakes even with moderate levels of algal productivity (Horne and Goldman, 1994). Furthermore, reservoir profiles collected in 2015, 2016, 2017, 2022, and 2023 indicate DO concentrations in the epilimnion and metalimnion are consistently above 80 percent saturation (WQ-1 Final Technical Report, provided in Volume III of this DLA) and provide adequate DO to support aquatic beneficial uses. The moderate water temperatures and available DO in the metalimnion and epilimnion provide adequate refuge for fish during periods of low oxygen in the hypolimnion.

DO concentrations in waters with COLD and SPWN aquatic beneficial uses shall not be less than 8 mg/L in 1 day. DO concentration measurements in Project reservoirs and Project-affected stream reaches were less than the Basin Plan 8 mg/L water quality objective in Project reservoirs (Figure 6.4-7) and some Project-affected stream sites (Table 6.4-8) during the summer and fall sampling events in 2022 and 2023 (Table 6.4-13). High DO saturation (near 100 percent) coupled with low DO concentrations (less than 8 mg/L) are consistent with warm water conditions typical of summer and fall months. As the temperature of water increases, the amount of oxygen that water can hold in solution decreases.

Floating Material

For natural high-quality waters, concentrations of floating material shall not be altered to the extent that such alterations are discernable at the 10 percent significance level. SCE's compilation and review of data for the PAD revealed no instances in which floating material in Project reservoirs or Project-affected reaches of Lee Vining Creek and Glacier Creek have been altered.

Oil and Grease

For natural high-quality waters, the concentration of oils, greases, or other film- or coat-generating substances shall not be altered according to the Basin Plan. There is no available data on oil and grease. SCE's compilation and review of data for the PAD revealed no instances of oil and grease spills or observations of film or coating on the surface of the water or on objects in the water. Under routine Project O&M, the Project does not release oil and grease to surface waters and existing environmental measures include a hazardous substances plan (SCE, 1997c), which includes spill prevention and cleanup measures.

Non-degradation of Aquatic Communities and Populations

All wetlands shall be free from substances attributable to wastewater or other discharges that produce adverse physiological responses in humans, animals, or plants or that lead to the presence of undesirable or nuisance aquatic life. The Project does not discharge wastewater or other discharges into wetlands.

pH

In freshwaters with designated COLD or WARM aquatic beneficial uses, changes in normal ambient pH levels shall not exceed 0.5 pH units. Changes in pH in stream reaches exceeded 0.5 pH units a total of 3 out of 17 times pH was measured above and below Project reservoirs during the summer monitoring events in 2022 and 2023 (Figure 6.4-11, Table 6.4-13). Although the changes in pH exceeded 0.5 pH units, the variation in pH is likely due to the low buffering capacity typical of headwater reaches in granitic watersheds, whereby the relatively low weathering rates of the predominant geology (i.e., granite) results in low alkalinity, low hardness, and low conductivity, making the waters susceptible to wider changes in pH. These changes are naturally occurring and may include decreases in pH when naturally acidic inputs occur, such as snow melt, rainfall, and tannins from surrounding vegetation; and increases in pH when phytoplankton or other primary producers are present and photosynthesizing (i.e., reducing the carbon dioxide in the water and lowering the pH). The higher pH concentrations in summer are consistent with higher levels of phytoplankton productivity during the longer daylight hours.

Radioactivity

In waters designated as MUN, radionuclides shall not be present in concentrations that are deleterious to human, plant, animal, or aquatic life, or that result in the accumulation of radionuclides in the food web to an extent that presents a hazard to human, plant, animal, or aquatic life. The Project does not release radionuclides, and there are no reports of radionuclide detection in Project reservoirs or Project-affected stream reaches.

Sediment

The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect the water for beneficial uses. The Project is not known to have an adverse effect on erosion. No access roads or trails are included in the current FERC license, but SCE is proposing to add Saddlebag and Tioga access roads to the new FERC Project Boundary since they are currently used for O&M. Discussions are underway about the unpaved road to Poole Powerhouse and possibly adding sediment to Lee Vining Creek. There is little evidence of active surface erosion along Project reservoir shorelines. Sediment removal (sluicing, dredging, or removal by a clamshell) has not been necessary on a regular basis. Operation of the Project is unlikely to contribute sediment to Project waterbodies. Under routine Project O&M, the Project does not release sediment to surface waters and existing environmental measures include implementation of an erosion control plan (SCE, 1997a) and a spoils disposal plan (SCE, 1997b).

Sport Fish

According to the statewide Sport Fish Water Quality Objective for waters that include beneficial uses including COMM, WILD, and COLD, the mean methylmercury for the highest trophic level of fish[6] shall not exceed 0.2 µg/g[7] fish tissue within a calendar year (SWRCB, 2017). According to freshwater trophic level classifications associated with this objective, trophic level 4 fish include brown trout (200 to 500 mm) and trophic level 3 fish include brook trout and rainbow trout (150 to 500 mm). The mean total mercury for highest trophic level trout species captured in each of the Project reservoirs during 2008 was less than the 0.2 µg/g numerical objective (Figure 6.4-17). The potential for Project reservoirs to methylate mercury that can bioaccumulate in fish and pose a health risk to humans (i.e., comparison to OEHHA guidelines) that consume them is described in Section 6.4.2.2, *Bioaccumulation of Mercury in Fish Tissue and Potential Consumption Guidelines to Avoid Human Health Risks in Project Reservoirs*. Based on available data, the numerical water quality objective for methylmercury in fish tissue is not exceeded in Project reservoirs and is consistent with the OEHHA SV of 0.08 µg/g to identify fish with mercury concentrations that pose a potential public health concern (Lloyd and Denton, 2005).

Settleable Materials

Waters shall not contain substances in concentrations that result in deposition of material that causes nuisance or that adversely affects the water for beneficial uses. For natural high-quality waters, the concentration of settleable materials shall not be raised by more than 0.1 mL per liter. Saddlebag Lake, Ellery Lake, and Tioga Lake are naturally occurring lakes that existed prior to Project construction. All three lakes have historically trapped coarse sediment (e.g., sand, gravel) delivered from upstream source areas. Downstream of the dams, post-glacial topography and sediment enters the system via hill slopes and unimpaired tributaries (e.g., Slate Creek, Warren Fork). Gravel mapping conducted in 2023 suggests gravel is abundant in all Project-affected stream reaches in Lee Vining

[6] Because fish tissue concentrations of mercury increase with fish size and age, the water quality objective is tied to fish and their trophic position in the aquatic food web.

[7] Methylmercury concentrations in fish tissue are comparable to total mercury. The objective reported as 0.2 milligrams per kilogram, which is equivalent to 0.2 µg/g.

and Glacier Creeks (*Aquatic Habitat Mapping and Sediment Characterization [AQ-3] Final Technical Report* in DLA Volume III). Results of the Lower Lee Vining Creek Channel Morphology (AQ-6) Study suggest gravel and fine sediments are mobile in lower Lee Vining Creek downstream of Poole Powerhouse.

Suspended Materials

The Basin Plan numerical objective for natural high-quality waters states that the concentration of total suspended materials shall not be altered to the extent that such alterations are discernible at the 10 percent significance level. TSS measured at all Project reservoirs and Project-affected stream reaches sampled in 2022 and 2023 were at or below detection limits (2 mg/L) (Table 6.4-10). These low concentrations of suspended materials support COLD and SPWN aquatic beneficial uses.

Tastes and Odors

In accordance with the Basin Plan, tastes and odors shall not be altered in naturally high-quality waters. SCE's compilation and review of data for the PAD revealed no instances where the taste and odor have been altered. Conductivity and TDS were low and did not exceed 22 California Code of Regulations 64449 criteria (see Section 6.4.2.3, [*Consistency with Current Resource Management Objectives*] Chemical Constituents).

Temperature

The Basin Plan requires that for waters designated COLD aquatic beneficial use, the temperature shall not be altered unless it can be demonstrated to the satisfaction of the Regional Board that such an alteration in temperature does not adversely affect the water for beneficial uses. Water temperatures in Project reservoirs and Lee Vining and Glacier Creeks exhibited natural variation throughout the watersheds due to changing influences of tributary and groundwater inputs, changes in daytime and nighttime heating and cooling periods across seasons, as well as the moderating influences of the reservoirs (Table 6.4-8, Figure 6.4-4, Figure 6.4-5). Stream temperatures upstream and downstream of Project reservoirs ranged from 0.5 to 7.1 °C. Water downstream of Project reservoirs were both cooler and warmer than stream inflows with variations in temperature with season, waterbody, and water year type. These variations in temperature would be similarly observed in natural high elevation lakes.

Water temperatures in Project reservoirs and Project-affected stream reaches support the COLD aquatic beneficial use and temperatures were suitable for fish (less than 20 °C) which is normally considered the upper limit for feeding and growth of brown trout (Frost and Brown, 1967; Elliott, 1981).

There are no reports of temperatures adversely affecting beneficial uses.

Toxicity

The Basin Plan states that all waters shall be maintained free of toxic substances in concentrations that are toxic or that produce detrimental physiological responses in human, plant, animal, or aquatic life. The Project does not directly release or mobilize toxins (e.g., trace metals, oil and grease), and SCE is not aware of Project O&M activities that may directly cause mercury methylation. However, bottom waters at Tioga and Saddlebag lakes exhibit low DO and indicate conditions (e.g., anoxia [DO less than 1 mg/L]) that may cause mobilization of un-ionized ammonia or trace metals (i.e., mercury) (Figure 6.4-6). Un-ionized ammonia concentrations measured in 2022 and 2023 did not approach toxicity limits (see Section 6.4.2.3, [*Consistency with Current Resource Management Objectives*] Ammonia). Although there is no data for total or dissolved metals, evidence of fish mercury bioaccumulation was found in Saddlebag and Tioga Lakes during 2022. Additional discussion on mercury bioaccumulation in fish and the potential to pose a health risk to humans that consume them is included in Section 6.4.2.2, *Bioaccumulation of Mercury in Fish Tissue and Potential Consumption Guidelines to Avoid Human Health Risks in Project Reservoirs*.

SCE's implementation of the *Hazardous Substances Plan* (SCE, 1997c), which includes spill prevention and cleanup of hazardous substances, will reduce potential adverse effects of the Project on toxicity from hazardous substances to insignificant levels. Pesticides are not used for vegetation management or rodent control at the Project or in the Inyo National Forest as a whole.

Turbidity

The Basin Plan specifies that 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. Although the Project does not directly discharge suspended sediments that would affect turbidity, to evaluate potential linkages between Hydro-resource Optimization and turbidity levels in lower Lee Vining Creek, continuous logging turbidimeters were installed at two locations downstream of Ellery Lake, including Sites LVC-DSPP1 and LVC-DSPP2 located 0.2 river miles and 4.3 miles downstream of Poole Powerhouse, respectively.

Turbidity in lower Lee Vining Creek between Poole Powerhouse and the LADWP Diversion Dam was highly variable throughout the 2022 and 2023 monitoring period. During 2022, turbidity ranged between 0 to 90 NTU at Site LVC-DSPP1 and 0 to 280 NTU at the Site LVC-DSPP2. The winter of 2022 to 2023 resulted in a record Sierra Nevada snowpack and prolonged periods of high flows, and high turbidity were observed in lower Lee Vining Creek downstream of Poole Powerhouse. At Site LVC-DSPP1, turbidity ranged from approximately 0 to 200 NTU, whereas turbidity ranged from approximately 0 to 550 NTU at Site LVC-DSPP2.

To evaluate the effects of Hydro-resource Optimization upon turbidity, representative data collected during baseflow conditions were compared to periods of powerhouse operations. During summer baseflows monitored in July 2022, approximately 24 Hydro-resource Optimization events were evaluated. At Site LVC-DSPP1, 0.2 river miles downstream of Poole Powerhouse, turbidity levels of approximately 0.5 to 1 NTU were generally observed, with increases to approximately 2 NTU during periods of Hydro-resource Optimization. At Site LVC-DSPP2, 4.3 river miles downstream of Poole

Powerhouse, turbidity levels of 0.5 to 1.5 NTU were observed with increases to approximately 3.5 NTU on average during periods of Hydro-resource Optimization.

Due to the extended run-off conditions, Hydro-resource Optimization did not occur in 2023 until later in the year (fall season); although the flow-associated turbidity increases during 2022 are consistent with remobilization of fine sediment deposits in lower Lee Vining Creek, there was no indication that increased turbidity is adversely affecting aquatic beneficial uses.

The observed increases in turbidity did not exceed natural levels and were well below the range of natural variability observed during the 2022 to 2023 monitoring period.

6.4.2.4. Proposed Mitigation and Enhancement Measures

SCE proposes to maintain current operations at the Project and maintain current MIF requirements. Under the Proposed Action, this includes continued implementation of several existing PME measures (Appendix E.1) and Management Plans:

- PME-1: MIF requirements
- PME-2: Reservoir level requirements
- PME-4: Resource Management Plan

6.5. Fish and Aquatic Resources

This section describes the fish and aquatic resources that have the potential to occur in the vicinity of the Project. The study area includes Project reservoirs (Saddlebag Lake, Tioga Lake, and Ellery Lake) and Project-affected stream reaches, including Lee Vining Creek between Saddlebag Dam and Ellery Lake, between Rhinedollar Dam and Poole Powerhouse, and between Poole Powerhouse and the LADWP Lee Vining Creek Diversion Dam impoundment. It also includes the Glacier Creek reach between Tioga Dam and its confluence with Lee Vining Creek.

Fish and aquatic studies were conducted as part of this relicensing effort in 2022 and 2023. Fish population studies were conducted in each of the reservoirs and select study locations along Lee Vining and Glacier Creeks to characterize fish species composition and distribution (Reservoir Fish Populations [AQ-1] Study and Stream Fish Populations [AQ-2] Study). Studies were also conducted to characterize habitat conditions and to quantify the extent of invasive aquatic plants and algae within Project stream reaches (Aquatic Habitat Mapping and Sediment Characterization [AQ-3] and Aquatic Invasive Plants [AQ-4] Study). Final Technical Reports for these studies are included in Volume III of this DLA.

No federal ESA-listed or California ESA-listed fish species, federal ESA-designated critical habitat, or EFH as defined by the Magnuson-Stevens Fishery Conservation and Management Act; or anadromous, catadromous, or migratory fish occur within Project waters. Fish and aquatic species that have the potential to occur in the study area are described below.

6.5.1. Affected Environment

The affected environment for fish and aquatic resources includes Project reservoirs and stream reaches downstream of each of the Project dams. Project reservoirs and stream reaches were historically fishless waters until the late 1800s when brown trout (*Salmo trutta)*, brook trout (*Salvelinus fontinalis*), and rainbow trout (*Oncorhynchus mykiss)* were stocked to support a recreational fishery. Current brown and brook trout populations are naturally recruiting and are no longer stocked in Project waters. Sterile rainbow trout continue to be supplemented. Lahontan redside (*Richardsonius egregious*), a cyprinid species native to the Lake Lahontan Basin, were historically introduced to Project waters and persist today.

6.5.1.1. Fish Life Histories

The timing of major life history events for fish species known to occur in Project waters is included in Table 6.5-1.

Table 6.5-1. Life History Timing of Fish Species Likely to Occur in the Study Area

Species/Stage	OCT		NOV		DEC		JAN		FEB		MAR		APR		MAY		JUN		JUL		AUG		SEP	
Brown Trout (*Salmo trutta*)																								
Spawning	■	■	■	■	▒	▒																	▒	▒
Egg Incubation	■	■	■	■	■	■	▒	▒																
Fry/YOY	■	■															■	■	■	■	■	■	■	■
Juvenile	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Adult	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Brook Trout (*Salvelinus fontinalis*)																								
Spawning	■	■	■	■	■	▒	▒	▒																▒
Egg Incubation			■	■	■	■	■	■	▒	▒														
Fry/YOY	■	■															■	■	■	■	■	■	■	■
Juvenile	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Adult	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Rainbow Trout (*Oncorhynchus mykiss*)																								
Spawning									▒	■	■	■	■	■	■	■	■	■	▒					
Egg Incubation													▒	■	■	■	■	■	■	■	■	■	▒	
Fry/YOY	■	■																▒	■	■	■	■	■	■
Juvenile	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Adult	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Lahontan Redside (*Richardsonius egregious*)																								
Spawning															▒	■	■	■	■	■	■	▒		
Egg Incubation																	▒	■	■	■	■	■	■	▒
Fry/YOY	▒																			▒	■	■	■	■
Juvenile	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Adult	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

■ = Peak period   ▒ = Potential Use

Source: Moyle, 2002; SCE, 2007

YOY = young-of-year

BROWN TROUT

Brown trout are native to Europe, North Africa, and western Asia and were introduced to North America in the late 19th century for planting in coastal streams. They have been reared in hatcheries since and have been planted throughout the state of California (Moyle, 2002).

Optimal habitats for brown trout are medium to large, slightly alkaline, clear streams with riffles and large, deep pools. Adults tend to occupy the bottoms of pools, and younger trout can be found in pools and riffles (Moyle, 2002). Water temperatures limit brown trout distribution, with preferred temperatures ranging from 12to 20°C and optimal temperatures of 17to 18°C. Brown trout have a variable diet that changes with size and season; smaller trout prey upon drift organisms, while larger trout selectively feed on benthic aquatic invertebrates. Brown trout over 25 centimeters total length pursue large prey, such as fish, crayfish, and dragonfly larvae. Brown trout over 40 centimeters total length almost exclusively feed on fish. Feeding is most intense at dawn and dusk; however, active feeding can occur at any time (Moyle, 2002). During the winter, ice cover provides shelter from terrestrial predators and reduces the amount of light reaching the water, which has been found to reduce stress responses and increase swimming activity in brown trout (Watz et al., 2015). Brown trout fry, juveniles, and adults have been observed in streams with winter water temperatures of 0.1 to 1.5°C (Calkins, 1989).

Brown trout reach sexual maturity in their second to third year. Spawning takes place in the fall and winter, most commonly in November and December in California (Moyle, 2002). Brown trout captured during fish survey efforts in 2022 in upper Lee Vining and Glacier Creeks showed signs of reproductive activity, with male fish actively milting during fish processing (see the AQ-2 Final Technical Report, which is included in Volume III of this DLA). One redd was observed in upper Lee Vining Creek during AQ-2 survey efforts. Streams containing riffles with gravel size between 1 and 4 centimeters diameter are preferred for spawning, and the most suitable spawning locations within a stream are pool tails with deeper water, less turbulent current, and nearby cover. Spawning sites are selected by the female, and site selection occurs once water temperatures drop to 6 to 10°C (Moyle, 2002). Eggs are fertilized and buried in redds and incubate through the winter months. Fry emergence is in the early spring. Egg survival is not greatly influenced by redd temperature; egg survival has been observed at redd temperatures of zero to 8°C, with survival slightly higher at temperatures of zero to 1°C than at warmer temperatures (Calkins, 1989).

BROOK TROUT

Brook trout are native to the northeastern United States, west to eastern Minnesota and northeastern Iowa, and to eastern Canada. They were first introduced to California in 1871, and by 1872 they were being distributed throughout the state by the California Fish Commission (Moyle, 2002). Within the West Coast states, they have become established in mountain streams and lakes ranging from the San Bernardino Mountains to the Oregon border but are most abundant in the Sierra Nevada.

Brook trout in California are primarily found in isolated mountain lakes and headwater streams. Preferred temperatures range from 14 to 19°C; however, brook trout can feed at temperatures as low as 1°C and can acclimate to temperatures as high as 26°C (Moyle, 2002). Brook trout tend to feed on whichever organisms are most abundant, and prey items typically include terrestrial insects, aquatic insect larvae, and zooplankton but occasionally include benthic organisms and other fish. Feeding is most intensive in the evening and early morning; however, feeding will occur whenever there is sufficient light to see prey.

Maturity occurs at an early age. Some brook trout males are able to spawn as soon as the end of their first summer and females at the end of their second summer; however, it is more common for males to mature in their second or third year and females in their third or fourth year (Moyle, 2002). Spawning typically occurs in the fall but is dependent on water temperature (4 to 11°C). Brook trout captured during fish survey efforts in 2022 in upper Lee Vining and Glacier Creeks showed signs of reproductive activity, with male fish actively milting during fish processing (see the AQ-2 Final Technical Report, which is included in Volume III of this DLA). One redd was observed in upper Lee Vining Creek during AQ-2 survey efforts. Spawning sites are selected by females, and site characteristics include depths greater than 40 centimeters, water temperatures colder than the surrounding waters, gravel size between 1 and 4 centimeters diameter, nearby cover, and upwelling flow through substrate (Moyle, 2002). Eggs are fertilized and buried in redds and incubate through the winter months. Fry emerge in the early spring. Brook trout are adapted to spawn in lakes and females prefer sites with gravel-bottomed springs close to undercut banks or logs for redd conduction. This ability to spawn in lakes has allowed brook trout to maintain populations in mountain lakes without accessible inlets or outlets, something most other salmonids require (Moyle, 2002).

RAINBOW TROUT

Rainbow trout found in Project waters are sterile, hatchery-reared trout planted for recreation. Although they occur in Project reservoirs, they are nonmigratory (FERC, 1992).

Rainbow trout typically occupy highly oxygenated coldwater habitats, including lakes, reservoirs, streams, and rivers. Optimal growth occurs in waters of 15 to 18°C with near-saturation levels of DO (Moyle, 2002). Stream-resident rainbow trout typically remain within a few hundred meters of a stream throughout their entire lives, although some individuals will stray more than others (Moyle, 2002). For their first few years, naturally produced rainbow trout occupy cool, clear, permanent streams of fast-flowing waters with ample riffle habitat, cover provided by undercut banks and riparian vegetation, and abundant invertebrate life. Older trout will occupy a variety of deeper habitats including pockets behind rocks, runs, and pools, and will stay in close proximity to areas where fast water will deliver drifting invertebrates, such as at pool inlets (Moyle, 2002). They are highly successful competitors who will aggressively defend feeding territories in streams, both from other species and from other rainbow trout. Prey items include drifting aquatic organisms, terrestrial insects, benthic invertebrates, and an occasional small fish (Moyle, 2002). During the winter, juvenile stream-resident rainbow trout will use log jams, upturned roots, and debris piles as important sources of cover, whereas adults will seek out boulders. Rainbow trout adults are less active in the winter and may remain in one place during this period (Calkins, 1989).

Rainbow and cutbow trout stocked in Project waters are triploid (sterile) fish and are not expected to spawn within Project-affected stream reaches. Non-sterile resident rainbow trout typically mature in their second or third year, reaching sizes greater than 13 centimeters. They typically spawn from February to June; however, low temperatures may extend spawning to July or August. Spawning occurs in redds that females dig out in coarse gravel at the tail of a pool or in a riffle. Spawning may occur on annual or biennial intervals. The number of eggs laid per female can range from 200 to 12,000, with trout under 30 centimeters typically laying fewer than 1,000 eggs (Moyle, 2002). During the winter, eggs have remained viable at temperatures as low as 0.3 to 2.0°C (Calkins, 1989).

LAHONTAN REDSIDE

Lahontan redside are a small minnow species native to lakes and streams within the old Lake Lahontan Basin in the northeastern Sierra Nevada, including the Susan, Truckee, Carson, and Walker basins. They have been introduced to several watersheds in western slopes of the Sierra Nevada, including the Sacramento, Feather, American, and Mokelumne rivers. Within Mono County, a population of Lahontan redside is present in Saddlebag Lake (see the *Reservoir Fish Population [AQ-1] Final Technical Report*, which is included in Volume III of this DLA). Lahontan redside generally measure less than 100 mm, but some fish can measure over 170 mm.

Lahontan redside can be found in a wide range of habitat conditions. In reservoirs, they are often found in large schools in shallow water with rocky substrate (Moyle, 2002). Lahontan redside feed primarily on invertebrates. Sexual maturity occurs when fish reach 3 to 4 years of age, with spawning generally taking place during late July when water temperature is between 13 and 24°C, although it can occur anytime between late-May and August. Fry rear in calm, shallow water. During winter when water temperatures are below 10°C, Lahontan redside retreat to the interstices of streambed substrate where they are relatively inactive. Their abundance can be negatively affected by high winter flows and predation by brown trout.

6.5.1.2. Reservoir Fish Assemblage

COMPOSITION AND STOCKING

The current fish assemblage in Project reservoirs is comprised of brook trout, brown trout, and rainbow trout in Ellery Lake; brook trout and rainbow trout in Tioga Lake; and brook trout and Lahontan redside in Saddlebag Lake (Figure 6.5-1).

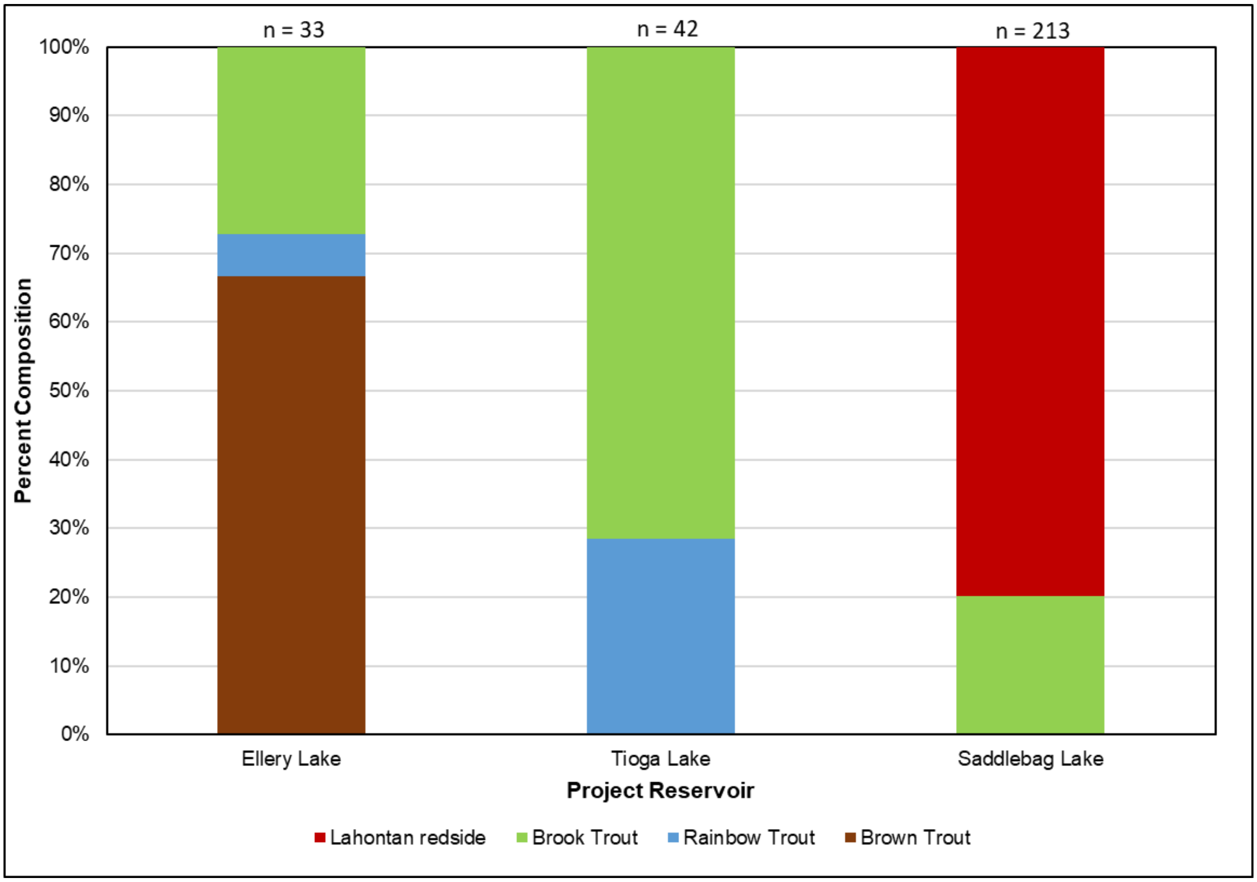


Figure 6.5-1. Fish Species Composition Observed in Project Reservoirs.

Saddlebag Lake also supports a large self-sustaining population of Lahontan redside, which were numerically the most abundant fish species captured in Saddlebag Lake. Lahontan redside were not observed in Ellery or Tioga Lakes. Of trout species observed, brown trout were the most abundant in Ellery Lake while brook trout were most abundant in Tioga and Saddlebag Lakes. Rainbow trout were the least abundant trout species observed in Ellery and Tioga Lakes, and no rainbow trout were captured in Saddlebag Lake. The low abundance of rainbow trout is likely a result of no stocking by CDFW in the three Project reservoirs during 2022 (Table 6.5-2). However, an alternative party (not from CDFW) stocked limited numbers of rainbow trout in Tioga Lake during summer of 2022 (personal communication, Tioga Lake Campground Camp Host, August 3, 2022), but information on the specific number of fish stocked was not available.

Catchable rainbow trout (i.e., 0.5 pound or larger) have been planted in each of the three Project reservoirs to support a put and take fishery management strategy. Triploid (sterile) rainbow trout were added to the releases in 2011; since 2013, all planted rainbow trout have been sterile (Salamunovich, 2017a). Recent planting efforts by CDFW have ranged from zero to over 13,000 fish per reservoir per year and included a large release of small sub-catchable fingerling rainbow trout in 2021 (Table 6.5-2). Fish planting was not conducted by the CDFW in 2020 due to the COVID-19 pandemic nor in 2022 due to disease outbreaks at CDFW hatcheries (Salamunovich, 2021; personal communication, Graham Meese, Senior Environmental Scientist, CDFW, July 22, 2024) (Table 6.5-2).

Table 6.5-2. Rainbow Trout Stocking Information for Project Reservoirs, 2017–2023

Year	Waterbody	Number	Pounds	**Average** Weight per Fish **(pounds)**
2017	Saddlebag Lake	12,825	6,475	0.50
	Tioga Lake	13,150	6,690	0.51
	Ellery Lake	13,150	6,690	0.51
2018	Saddlebag Lake	800	400	0.50
	Tioga Lake	3,560	1,700	0.48
	Ellery Lake	3,980	1,900	0.48
2019	Saddlebag Lake	4,000	2,000	0.50
	Tioga Lake	4,000	2,000	0.50
	Ellery Lake	4,200	2,100	0.50
2020	Saddlebag Lake	None	None	None
	Tioga Lake	None	None	None
	Ellery Lake	None	None	None
2021	Saddlebag Lake	None	None	None
	Tioga Lake	4,800	600	0.13 [a]
	Ellery Lake	9,600	1,200	0.13 [a]
2022	Saddlebag Lake	None [b]	None [b]	-- [b]
	Tioga Lake	None [b]	None [b]	-- [b]
	Ellery Lake	None [b]	None [b]	-- [b]
2023	Saddlebag Lake	3,300	2,000	0.61
	Tioga Lake	3,450	1,500	0.43
	Ellery Lake	5,600	2,000	0.36

Sources: Data provided by CDFW as cited in Salamunovich, 2021; and personal communication, Graham Meese, Senior Environmental Scientist, CDFW, July 22, 2024

[a] Sub-catchable fingerling rainbow trout from the American River Hatchery were planted in Tioga and Ellery lakes in 2021 (Salamunovich, 2021).

[b] Fish stocking by CDFW did not occur in Project reservoirs in 2022 due to disease outbreak at CDFW hatcheries (personal communication, Graham Meese, Senior Environmental Scientist, CDFW, July 22, 2024). Records of fish stocking by other entities during 2022 could not be obtained prior to this report but were likely limited in numbers and only occurred in Tioga Lake (personal communication, Tioga Lake Campground Camp Host, August 3, 2022).

AGE-CLASS DISTRIBUTION

Salmonid age classes were based on size-at-age estimates from Moyle (2002) and scale readings (see the AQ-1 Final Technical Report, which is included in Volume III of this DLA). Although sample sizes were generally small, the ranges in size and age of fish captured confirms multiple age classes were present. Brook trout captured in Ellery Lake included young-of-year (YOY) and 3+ and 4+ age classes (Figure 6.5-2). Missing age classes may be due to low sampling efficiencies. Brown trout captured in Ellery Lake ranged in age from 2+ up to 6+ (Figure 6.5-3). Although, YOY and age 1+ were not observed, the age-class distribution of brown trout indicates annual recruitment is likely occurring in Ellery Lake. Rainbow trout ranged in age from 3+ and 4+ based on scale analysis (Figure 6.5-4). Of the two rainbow trout captured in Ellery Lake, one showed possible signs of hatchery origin (e.g., worn fins) (AQ-1 Final Technical Report [DLA Volume III]).

Brook trout captured in Tioga Lake ranged in age from 1+ to 4+ (Figure 6.5-5). Although, YOY were not observed, the age-class distribution of brook trout confirms annual recruitment is likely occurring in Tioga Lake. Rainbow trout captured in Tioga Lake ranged from 3+ to 6+ based on scale analysis (Figure 6.5-6). Of the 12 rainbow trout captured in Tioga Lake during this study, 5 showed clear signs of hatchery origin (e.g., worn fins) (AQ-1 Final Technical Report [DLA Volume III]).

Brook trout captured in Saddlebag Lake ranged in age from about 1+ to 5+ (Figure 6.5-7). Although, YOY were not observed, the age-class distribution of brook trout confirms natural recruitment is likely occurring in Saddlebag Lake. The distribution of sizes of Lahontan redside captured in Saddlebag Lake are likely to include fish in the YOY through 4+ age classes based on size-at-age estimates reported in Moyle (2002) (Figure 6.5-8).

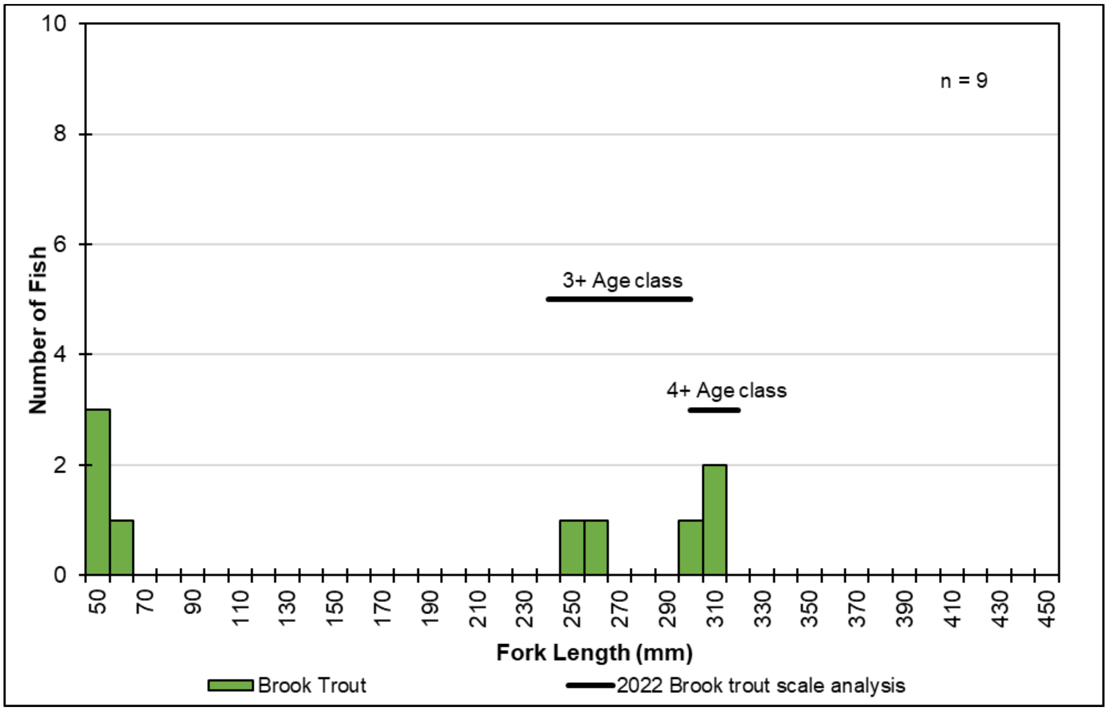


Figure 6.5-2. Length Frequency and Age Class Distribution for Brook Trout Captured in Ellery Lake During 2022 Sampling.

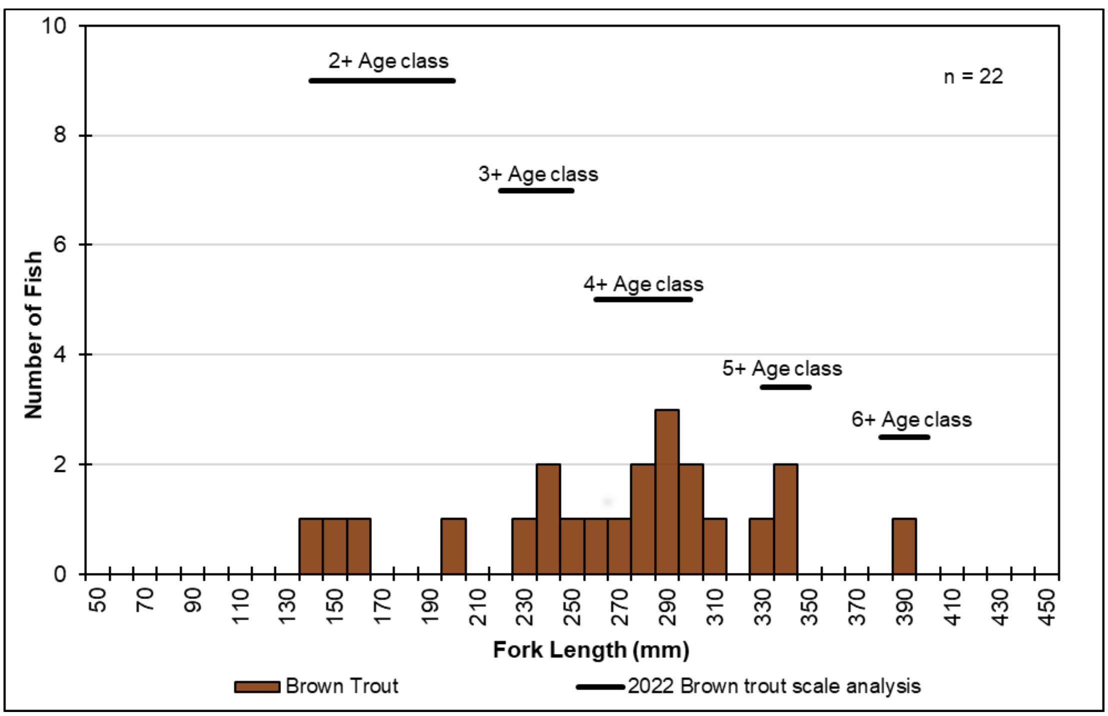


Figure 6.5-3. Length Frequency and Age Class Distribution for Brown Trout Captured in Ellery Lake During 2022 Sampling.

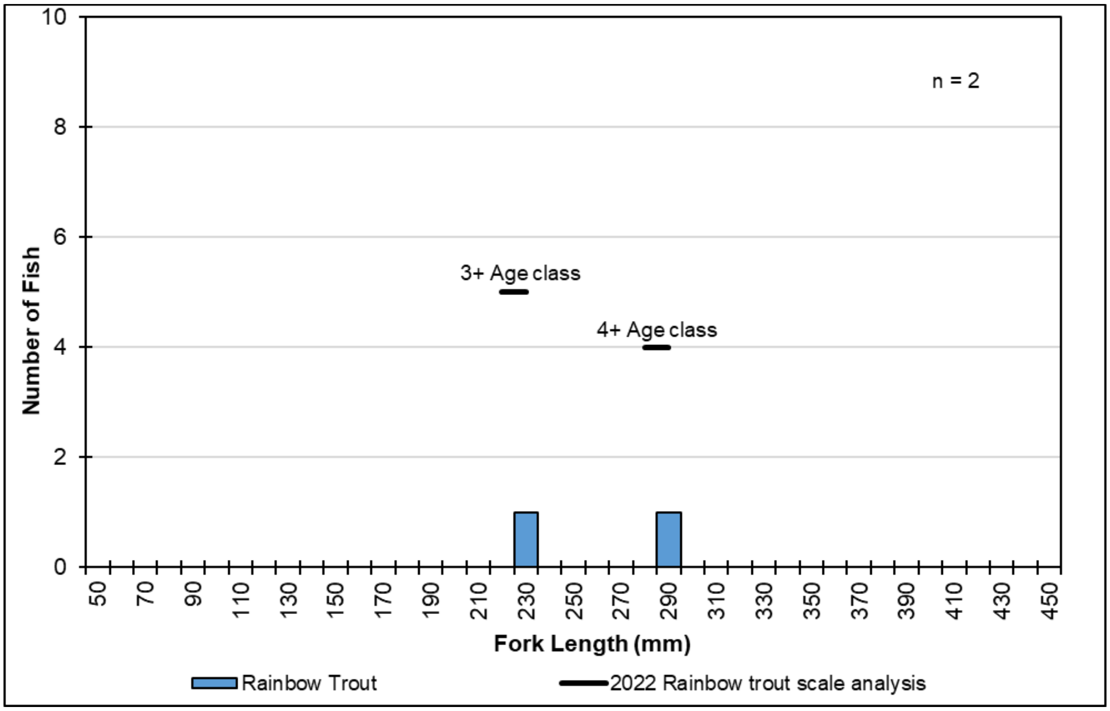


Figure 6.5-4. Length Frequency and Age Class Distribution for Rainbow Trout Captured in Ellery Lake During 2022 Sampling.

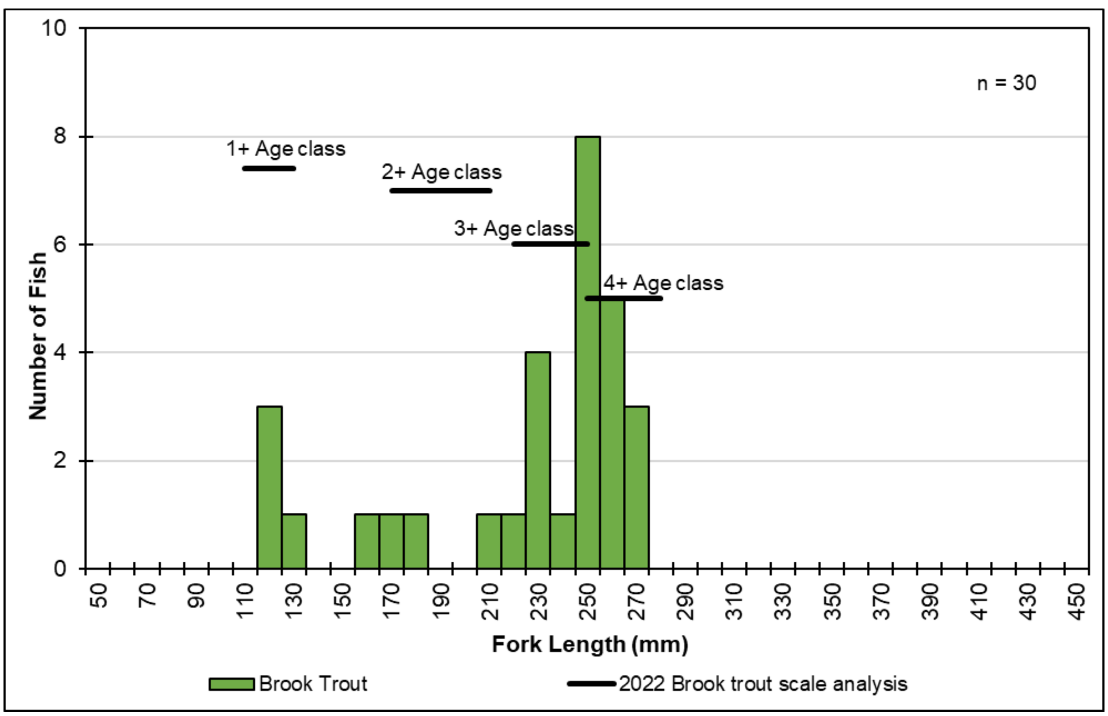


Figure 6.5-5. Length Frequency and Age Class Distribution for Brook Trout Captured in Tioga Lake During 2022 Sampling.

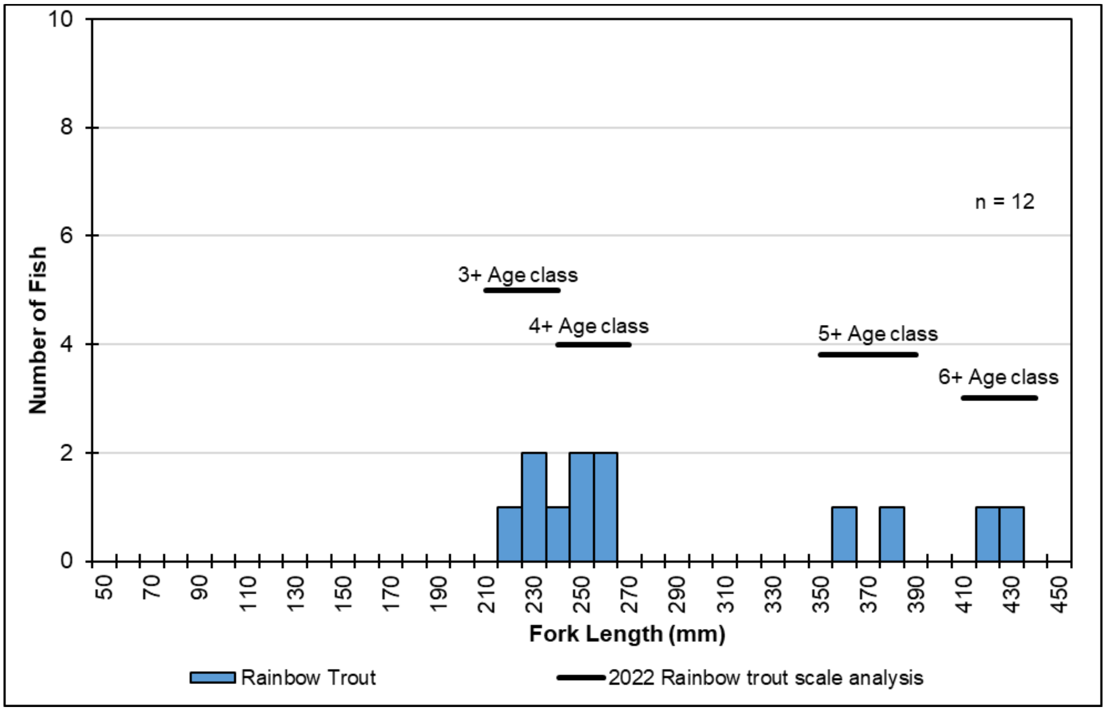
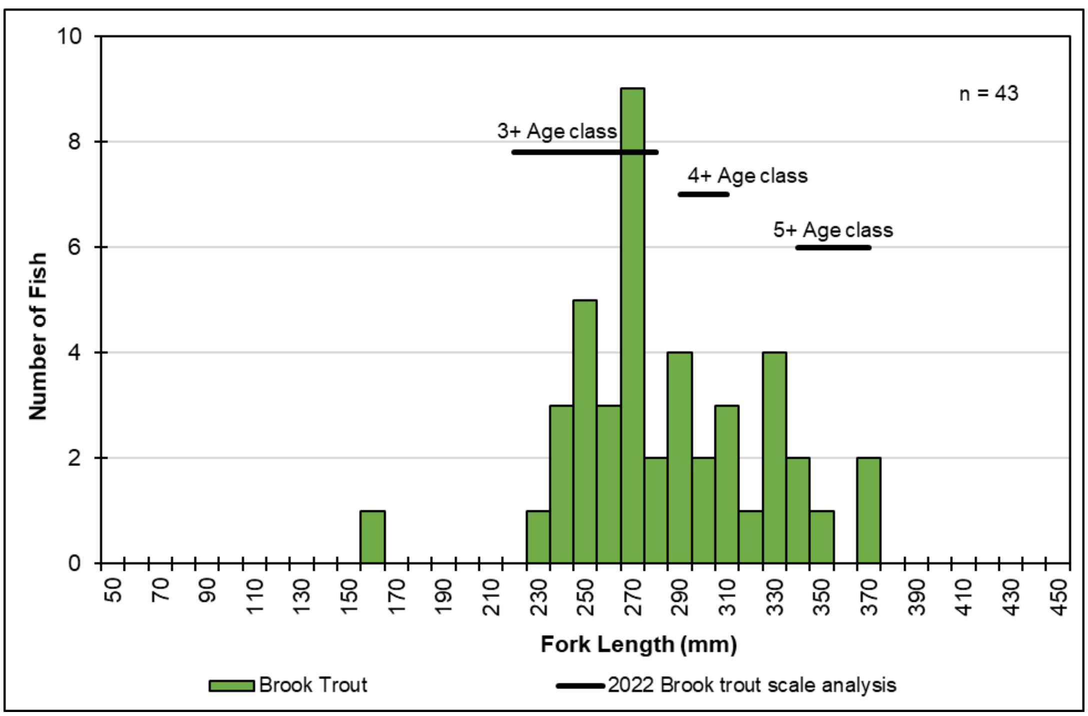
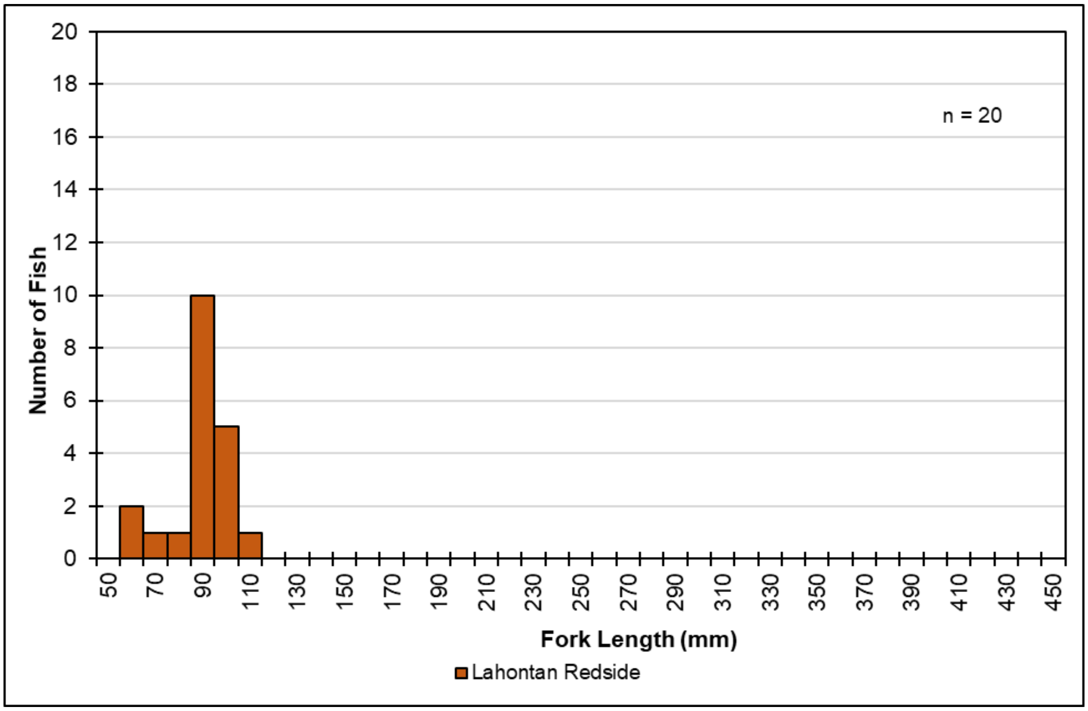


Figure 6.5-6. Length Frequency and Age Class Distribution for Rainbow Trout Captured in Tioga Lake During 2022 Sampling.



Due to the large number of Lahontan redside captured, a subsample of 20 individuals was measured.

Figure 6.5-7. Length Frequency and Age Class Distribution for Brook Trout Captured in Saddlebag Lake During 2022 Sampling.



Due to the large number of Lahontan redside captured, a subsample of 20 individuals was measured.

Figure 6.5-8. Length Frequency for Lahontan Redside Captured in Saddlebag Lake During 2022 Sampling.

6.5.1.3. Stream Fish Populations

Fish population surveys were conducted in 1984, 1986, 1999 to 2001, 2006, 2011, 2016, 2021, and 2022. During the 2022 relicensing study, biologists assessed fish populations in Project-affected stream reaches of Lee Vining and Glacier Creeks comprised of seven electrofishing study sites (Table 6.5-3).

Table 6.5-3. Lee Vining Stream Fish Sampling Locations

Reach Description	2022 Study Site Code	Historical Site Code
Lower Lee Vining Creek		
Lee Vining Creek between Poole Powerhouse and the pool upstream of the LADWP Diversion Dam	LLVC-F1	NA
Upper Lee Vining Creek		
Lee Vining Creek between Glacier Creek and Ellery Lake	ULVC-F1	NA
Lee Vining Creek between Slate Creek and Glacier Creek	ULVC-F2	NA
Lee Vining Creek upstream of Slate Creek	ULVC-F3	Reach 1
	ULVC-F4	Reach 2
	ULVC-F5	Reach 3

Reach Description	2022 Study Site Code	Historical Site Code
Lower Lee Vining Creek		
Glacier Creek		
Glacier Creek downstream of Tioga Dam	GLC-F1	NA

Source: Salamunovich, 2021

LADWP = Los Angeles Department of Water and Power; NA = not applicable

COMPOSITION AND DISTRIBUTION

Fish resources in Project-affected stream reaches are dominated by naturally reproducing populations of nonnative, introduced brown trout and brook trout and a stocked population of rainbow trout. While uncommon, Lahontan redside have occasionally been captured during fish monitoring efforts in Lee Vining Creek downstream of Saddlebag Lake (Salamunovich, 2021).

Four species of fish were observed during the stream fish sampling efforts: brown trout, brook trout, rainbow trout, and a cutthroat trout-rainbow trout hybrid (*Oncorhynchus clarkii × mykiss* [cutbow]) (Figure 6.5-9). Brown trout were the most abundant species throughout all study sites, followed by brook trout (Figure 6.5-9). Two rainbow trout and one hybrid cutbow trout were captured during sampling; all were captured within the study site on Lee Vining Creek downstream of Poole Powerhouse (Site LLVC-F1).

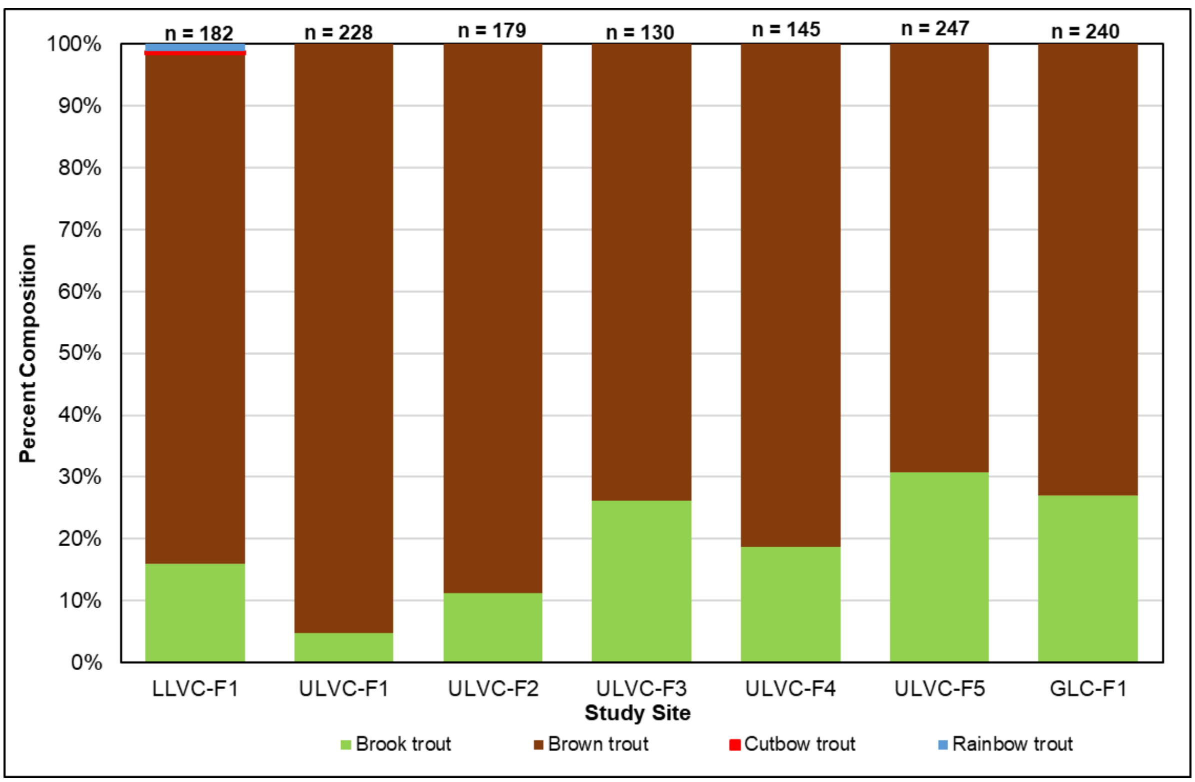


Figure 6.5-9. Fish Species Composition During 2022 Stream Surveys.

FISH ABUNDANCE, DENSITY, AND BIOMASS

Brown trout accounted for the highest abundance at all sites ranging between 1,801 and 4,029 fish per mile compared to 177 to 1,230 fish per mile for brook trout. Estimated abundance was highest for all trout in upper Lee Vining Creek downstream of Glacier Creek at Site ULVC-F1.

Fish densities varied by sample site, with density estimates for all trout ranging between 0.19 and 0.69 trout per square meter (trout/m^2) while estimates were generally similar between sites in upper Lee Vining Creek ranging from 0.27 to 0.34 trout/m^2 (Table 6.5-4). Brown trout densities generally drove overall densities, ranging between 0.15 and 0.51 trout/m^2 compared to 0.01 to 0.18 trout/m^2 for brook trout. Estimated densities were highest for both species in Glacier Creek.

Estimated overall biomass varied by sample site, ranging between 4.85 and 25.63 grams per square meter (g/m^2) across sample sites (Table 6.5-4). Brown trout biomass drove overall biomass in sites LLVC-F1, ULVC-F1, and ULVC-F2, whereas biomass was similar for brook and brown trout in the remaining sites. Biomass was highest for both species in Glacier Creek.

Table 6.5-4. Trout Population Estimated Abundance, Density, and Biomass in Lee Vining and Glacier Creeks, September 2022

Study Site ID	Trout Species	Number Observed	Abundance (trout per mile)			Density (trout per m^2)			Biomass (g/m^2)		
			Est.	Lower 95% C.I.	Upper 95% C.I.	Est.	Lower 95% C.I.	Upper 95% C.I.	Est.	Lower 95% C.I.	Upper 95% C.I.
Lee Vining Creek											
LLVC-F1	Brook	29	534	425 [c]	837	0.04	0.03 [c]	0.06	0.27	0.19 [c]	0.43
	Brown	150	2,189	2,010	2,369	0.15	0.14	0.16	6.97	6.40	7.54
	All Trout [a]	182	2,699	2,471	2,927	0.19	0.17	0.20	10.74	9.83	11.65
ULVC-F1	Brook	11	177	-- [b]	-- [b]	0.01	-- [b]	-- [b]	0.04	-- [b]	-- [b]
	Brown	217	4,029	3,634	4,423	0.31	0.28	0.35	4.92	4.44	5.40
	All Trout	228	4,136	3,794	4,478	0.32	0.30	0.35	4.85	4.45	5.25
ULVC-F2	Brook	20	367	322	413	0.03	0.03	0.03	1.70	1.49	1.91
	Brown	159	3,025	2,819	3,230	0.24	0.23	0.26	11.75	10.95	12.54
	All Trout	179	3,389	3,182	3,596	0.27	0.26	0.29	13.45	12.62	14.27
ULVC-F3	Brook	34	903	649 [c]	1,525	0.10	0.07 [c]	0.17	5.01	3.27 [c]	8.47
	Brown	96	1,801	1,640	1,962	0.20	0.18	0.22	4.51	4.10	4.91
	All Trout	130	2,256	2,273	2,839	0.28	0.25	0.31	8.44	7.50	9.37
ULVC-F4	Brook	27	759	478 [c]	1,585	0.08	0.05 [c]	0.17	2.79	1.59 [c]	5.83
	Brown	118	2,036	1,881	2,191	0.22	0.20	0.24	4.63	4.28	4.98
	All Trout	145	2,594	2,351	2,838	0.28	0.25	0.31	6.58	5.96	7.20
ULVC-F5	Brook	76	1,230	1,069	1,392	0.10	0.09	0.12	4.79	4.16	5.41
	Brown	171	2,865	2,551	3,179	0.24	0.21	0.27	5.67	5.05	6.29
	All Trout	247	4,091	3,743	4,440	0.34	0.31	0.37	10.50	9.61	11.40

Study Site ID	Trout Species	Number Observed	Abundance (trout per mile)			Density (trout per m^2)			Biomass (g/m^2)		
			Est.	Lower 95% C.I.	Upper 95% C.I.	Est.	Lower 95% C.I.	Upper 95% C.I.	Est.	Lower 95% C.I.	Upper 95% C.I.
Glacier Creek											
GLC-F1	Brook	65	1,078	1,018	1,137	0.18	0.17	0.19	13.02	12.30	13.73
	Brown	175	2,996	2,828	3,163	0.51	0.48	0.54	12.46	11.77	13.16
	All Trout	240	4,066	3,897	4,235	0.69	0.66	0.72	25.63	24.57	26.70

C.I. = Confidence Interval; g/m^2 = grams per square meter; m = meter; m^2 = square meter
[a] Rainbow trout and cutbow were included in all trout estimates due to low capture numbers (i.e., two rainbow and one cutbow).
[b] Depletion pattern did not allow for calculation of C.I.s.
[c] Lower C.I. was adjusted to value observed at sample site.

AGE-CLASS DISTRIBUTION

Lower Lee Vining Creek (Site LLVC-F1)

Fish captured in lower Lee Vining Creek downstream of Poole Powerhouse (Site LLVC-F1) included brown trout, brook trout, rainbow trout, and cutbow. Brown trout ranged from YOY to the 4+ age class based on size-at-age estimates from Moyle (2002) and scale readings (Figure 6.5-10). Brook trout ranged from YOY to the 3+ age class (Figure 6.5-11). Two rainbow trout and one cutbow were captured at Site LLVC-F1 were within 4+ and 5+ age classes based on scale analysis (Figure 6.5-11).

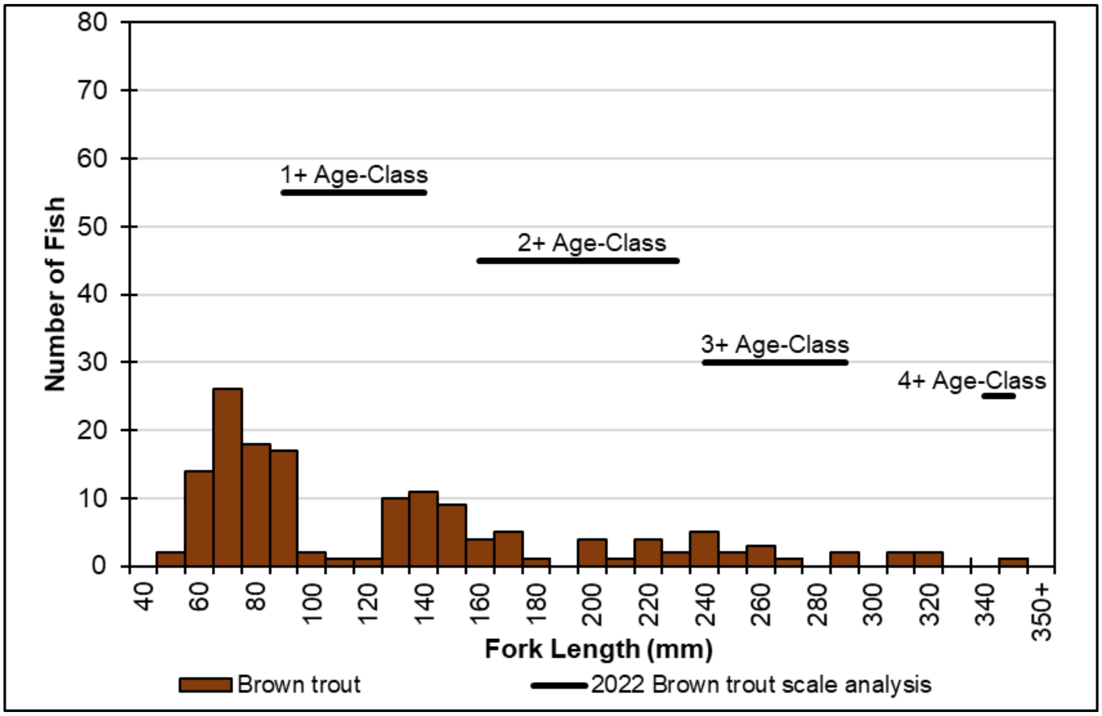


Figure 6.5-10. Length Frequency Histogram for Brown Trout Captured in Lee Vining Creek Downstream of Poole Powerhouse (Site LLVC-F1) During 2022 Sampling.

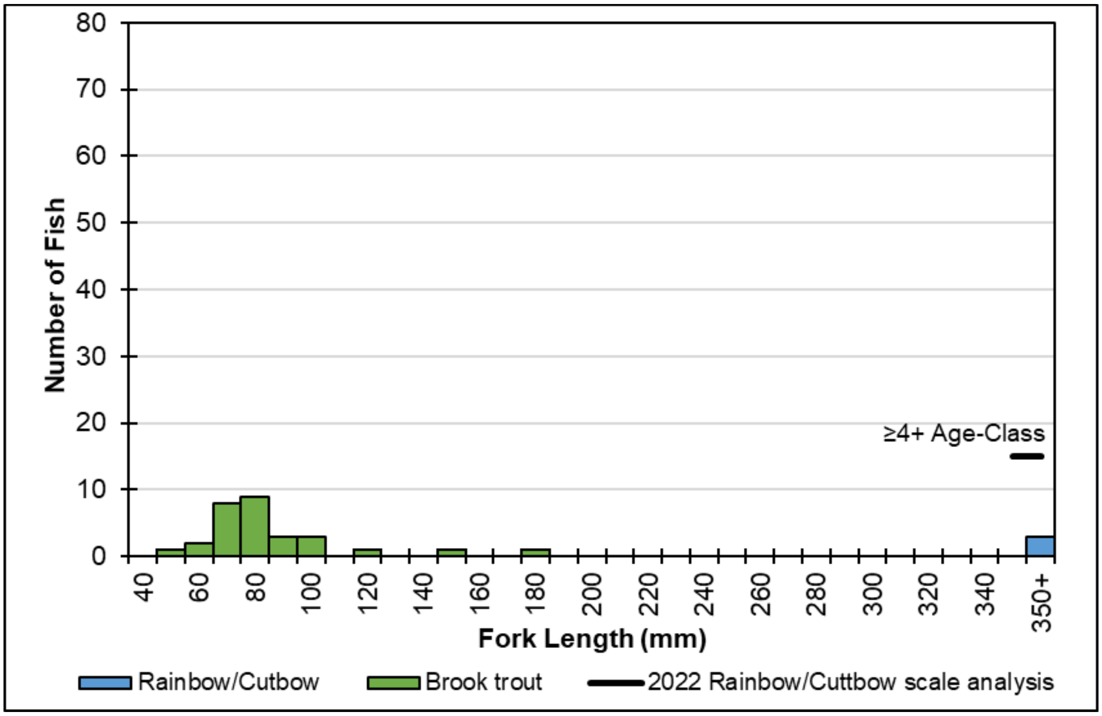


Figure 6.5-11. Length Frequency Histogram for Brook Trout, Rainbow Trout, and Cutbow Captured in Lee Vining Creek Downstream of Poole Powerhouse (Site LLVC-F1) During 2022 Sampling.

Upper Lee Vining Creek (Sites ULVC-F1 through ULVC-F3)

Fishes captured in upper Lee Vining Creek from Saddlebag Lake downstream to Ellery Lake (Sites ULVC-F1 through ULVC-F3) included brown trout and brook trout. Brown trout ranged from YOY to the 5+ age class, with one individual estimated to be in the 6+ age class based on size-at-age estimates from Moyle (2002) and scale readings (Figures 6.5-12 through 6.5-17). Brook trout ranged from YOY to the 5+ age class based on size-at-age estimates from Moyle (2002) and scale readings (Figures 6.5-12 through 6.5-17).

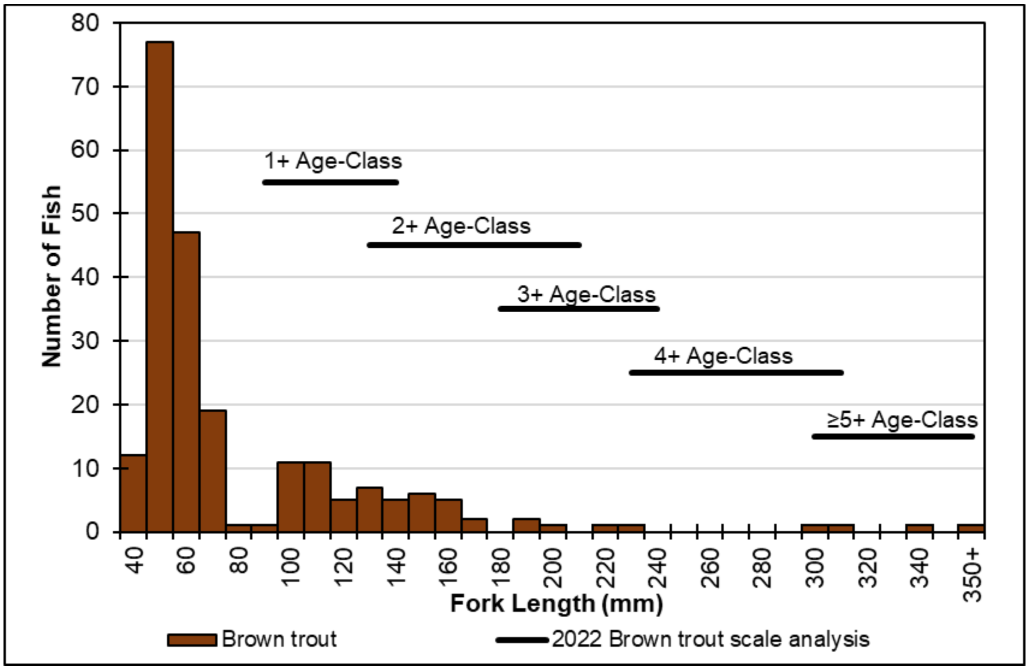


Figure 6.5-12. Length Frequency Histogram for Brown Trout Captured in Lee Vining Creek Downstream of Glacier Creek (Site ULVC-F1) During 2022 Sampling.

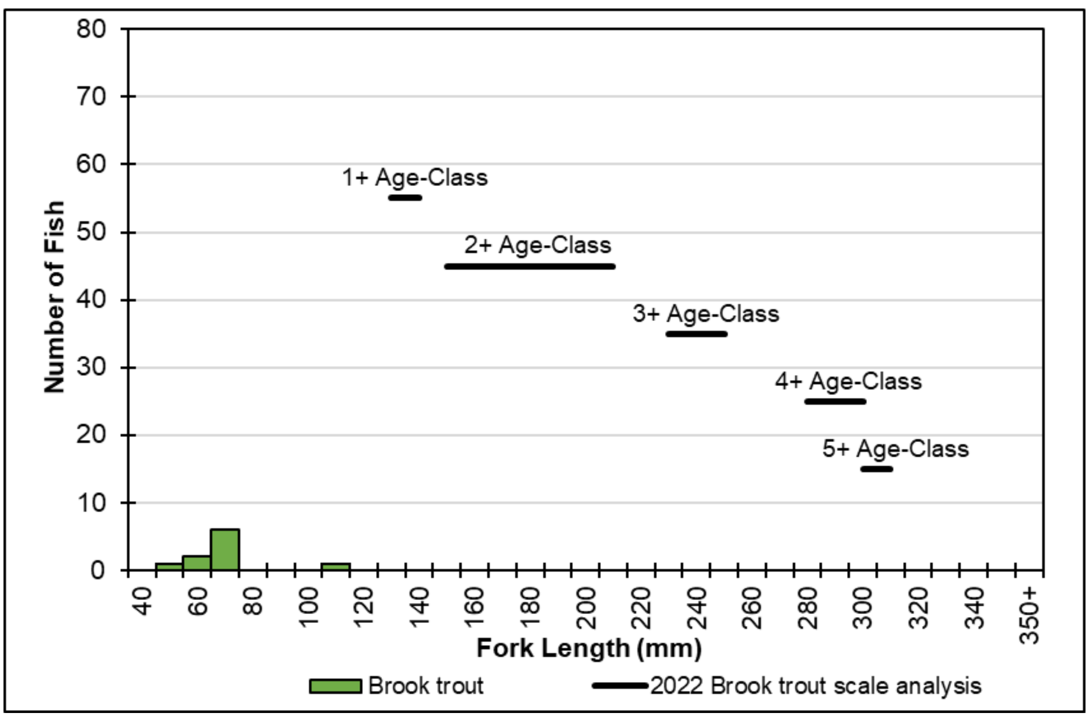


Figure 6.5-13. Length Frequency Histogram for Brook Trout Captured in Lee Vining Creek Downstream of Glacier Creek (Site ULVC-F1) During 2022 Sampling.

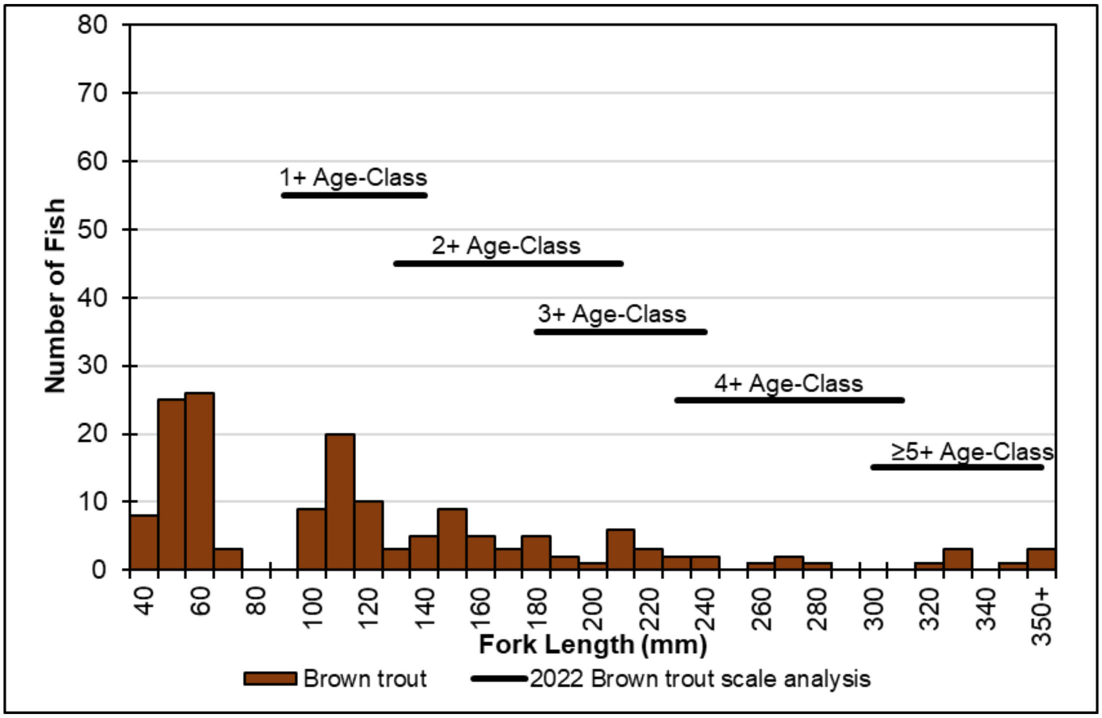


Figure 6.5-14. Length Frequency Histogram for Brown Trout Captured in Lee Vining Creek Upstream of Glacier Creek (Site ULVC-F2) During 2022 Sampling.

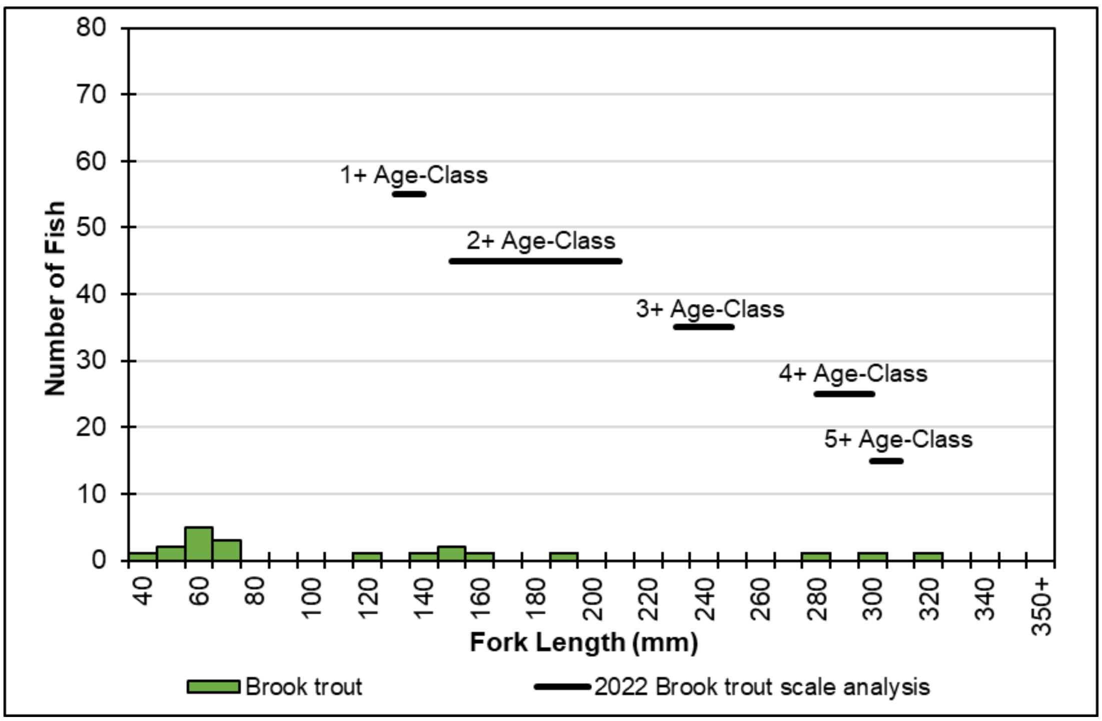


Figure 6.5-15. Length Frequency Histogram for Brook Trout Captured in Lee Vining Creek Upstream of Glacier Creek (Site ULVC-F2) During 2022 Sampling.

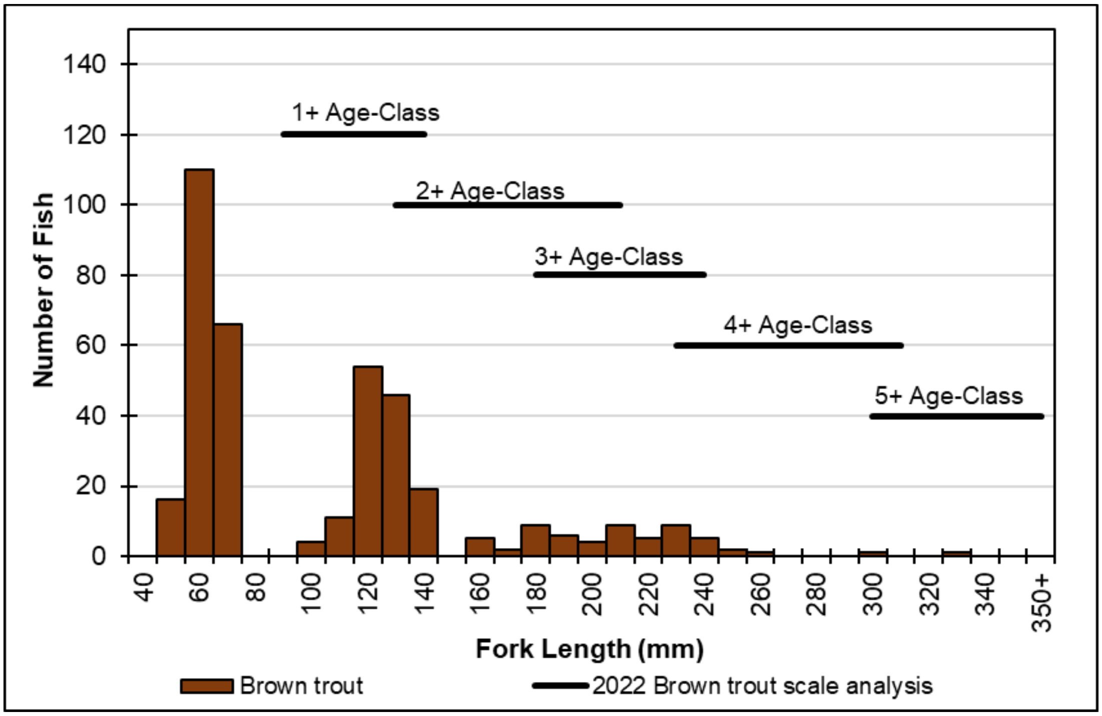


Figure 6.5-16. Length Frequency Histogram for Brown Trout Captured in Lee Vining Creek Downstream of Saddlebag Lake at Sites ULVC-F3 Through ULVC-F5 During 2022 Sampling.

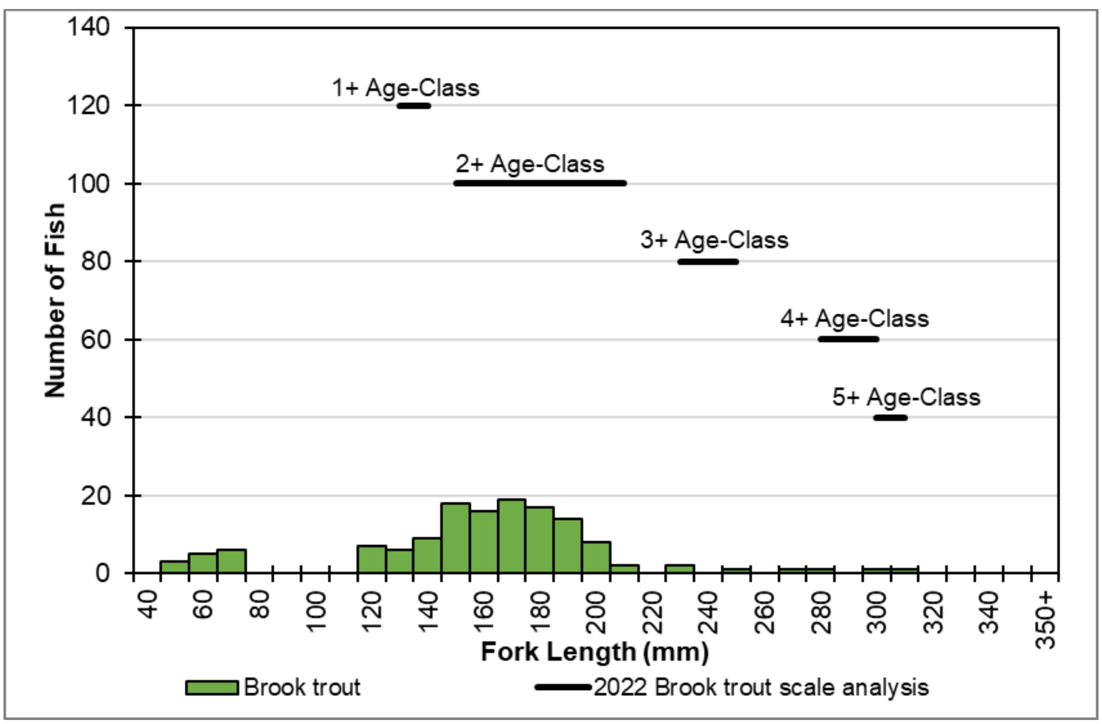


Figure 6.5-17. Length Frequency Histogram for Brook Trout Captured in Lee Vining Creek Downstream of Saddlebag Lake at Sites ULVC-F3 Through ULVC-F5 During 2022 Sampling.

Glacier Creek (Site GLC-F1)

Fish captured in Glacier Creek (Site GLC-F1) included brown trout and brook trout. Brown trout captured at Site GLC-F1 ranged from YOY up to the 5+ age class (Figure 6.5-18). Brook trout captured at Site GLC-F1 ranged from YOY to 4+ age classes (Figure 6.5-19). These age-class estimates for brown trout and brook trout are supported by length-at-age values from relevant literature and scale readings.

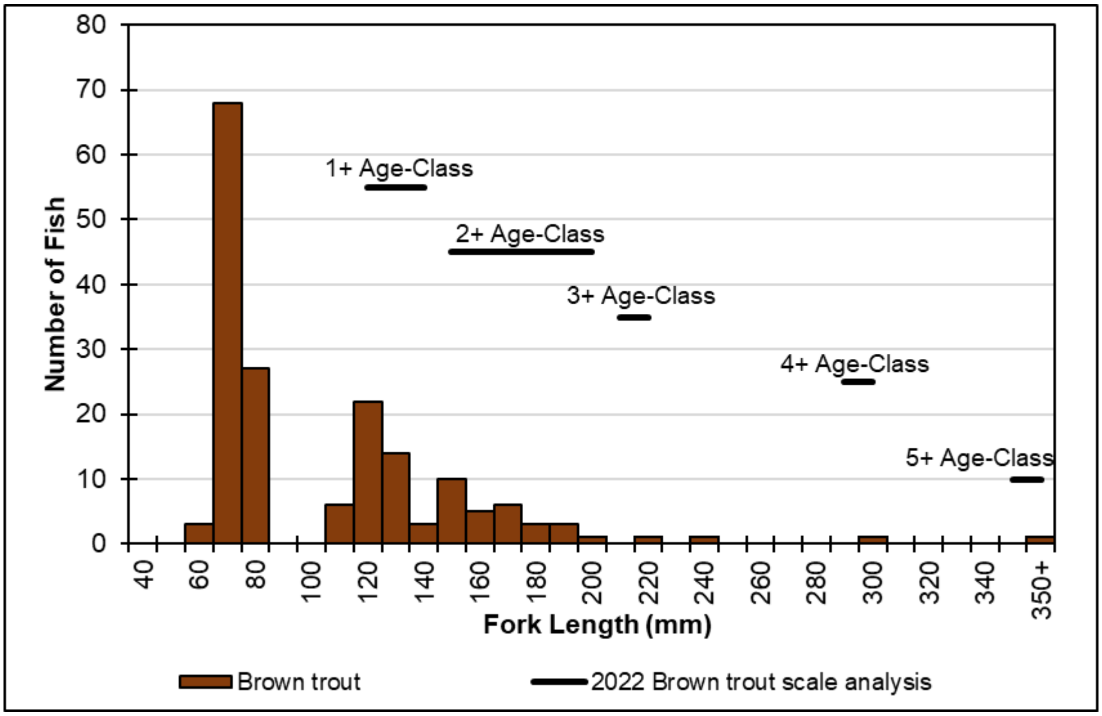


Figure 6.5-18. Length Frequency Histogram for Brown Trout Captured in Glacier Creek Downstream of Tioga Lake (Site GLC-F1) During 2022 Sampling.

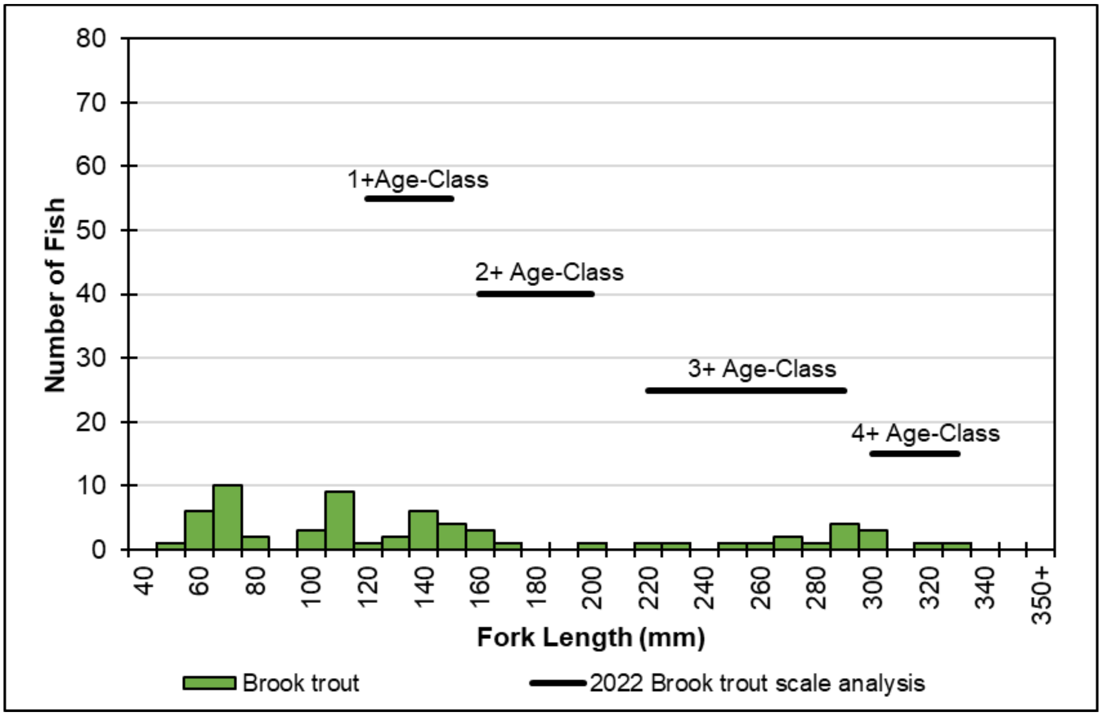


Figure 6.5-19. Length Frequency Histogram for Brook Trout Captured in Glacier Creek Downstream of Tioga Lake (Site GLC-F1) During 2022 Sampling.

6.5.1.4. Aquatic Habitat

Lee Vining Creek between Saddlebag Dam and Ellery Lake is comprised of mostly run and riffle habitat with relatively few pools. Project-affected stream reaches are generally moderate to high gradient (3 to 5 percent slope), comprised of cascades, high- and low-gradient riffles, step runs, and pools (Table 6.5-5). Upper Lee Vining Creek between Saddlebag Dam and the confluence of Slate Creek primarily consists of high-gradient riffles and cascades (Table 6.5-5). Stream widths are narrow within this reach and consistent throughout. Dominant substrate types within this reach are boulder and cobble substrate with minimal amounts of smaller substrates (Figure 6.5-20). Aquatic habitat surveys conducted in 1986 indicate this reach was similarly dominated by moderate-gradient riffle habitat and a small amount of cascade habitat (EA, 1986).

Table 6.5-5. Stream Habitat-Typing Summary for Lee Vining Creek Between Saddlebag Dam and the Confluence of Slate Creek, 2023

Habitat Type	Total Length (feet)	Length Relative Frequency (%)	Number of Units	Unit Relative Frequency (%)	Average Width (feet)	Average Pool Depth (feet)
Cascade	1,488	47.9	1	25.0	10.0	--
High-gradient riffle	1,523	49.0	2	50.0	10.5	--
Step run	97	3.1	1	25.0	9.0	--

Habitat Type	Total Length (feet)	Length Relative Frequency (%)	Number of Units	Unit Relative Frequency (%)	Average Width (feet)	Average Pool Depth (feet)
Total	3,108	100.0	4	100.0	--	--

% = percent; -- = no data

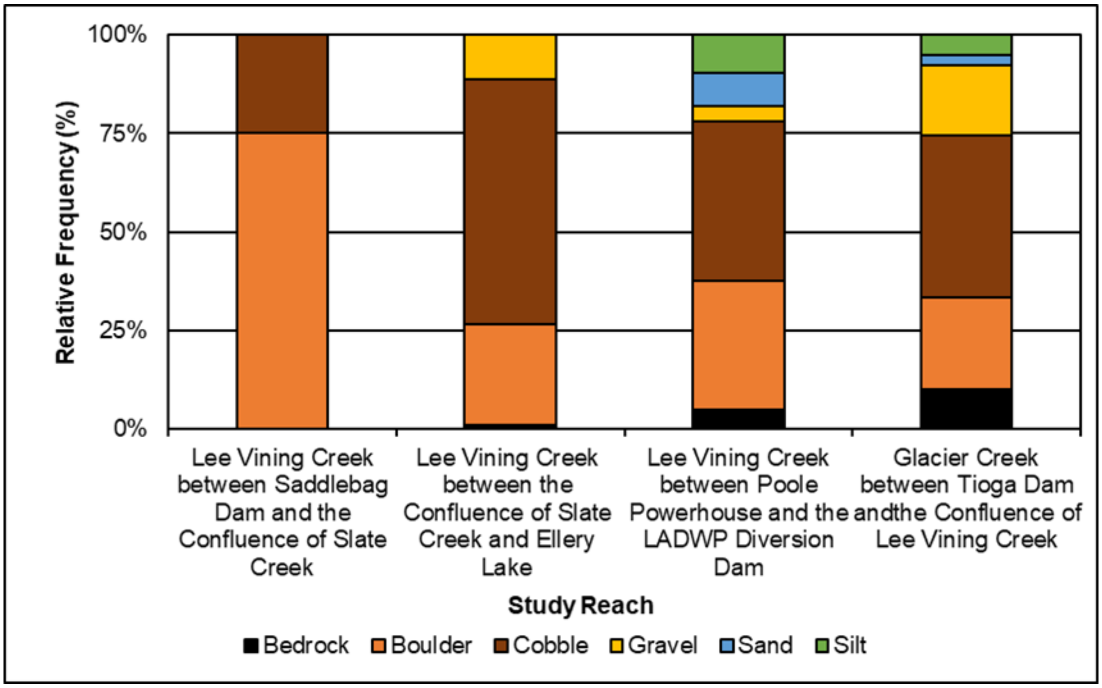


Figure 6.5-20. Dominant Substrate Types in Lee Vining Creek and Glacier Creek, 2023.

Upper Lee Vining Creek between the confluence of Slate Creek and Ellery Lake is comprised of two low-gradient meadow sections separated by brief high-gradient canyon sections; habitat within this reach is characterized by low-gradient riffles and step runs (Table 6.5-6).The channel within this reach narrows near Slate Creek but is primarily unconfined as it flows through the meadow sections. Dominant substrate types in this reach are cobble and boulder substrate with large deposits of gravel within the meadow sections (Figure 6.5-20). Aquatic habitat surveys conducted in 1986 indicate a similar diversity of habitat types ranging from low-gradient meadows, a steeper gradient canyon, and a section of broad riffle and run habitat (EA, 1986).

Table 6.5-6. Habitat-Typing Summary for Lee Vining Creek Between the Confluence of Slate Creek and Ellery Lake, 2023

Habitat Type	Total Length (feet)	Length Relative Frequency (%)	Number of Units	Unit Relative Frequency (%)	Average Width (feet)	Average Pool Depth (feet)
Cascade	92	0.6	1	1.1	11.0	--
High-gradient riffle	2,794	17.1	12	13.3	17.1	--

Habitat Type	Total Length (feet)	Length Relative Frequency (%)	Number of Units	Unit Relative Frequency (%)	Average Width (feet)	Average Pool Depth (feet)
Low-gradient riffle	6,506	39.8	29	32.2	20.0	--
Run	2,608	16.0	20	22.2	18.2	--
Step run	3,333	20.4	15	16.7	18.1	--
Scour pool	1,009	6.2	13	14.4	20.2	3.3
Total	16,342	100.0	90	100.0	--	--

% = percent; -- = no data

Lower Lee Vining Creek between Poole Powerhouse and the LADWP Diversion Dam consists of high-gradient riffles and runs but also contains a high frequency of pool habitat (Table 6.5-7). Approximately 3 miles downstream of Poole Powerhouse, Lee Vining Creek enters a large meadow where habitat consists of contiguous run habitat for more than 0.6 mile. At the upstream and downstream ends of the reach, Lee Vining Creek flows through confined canyon sections, while the middle section of the reach runs through a large unconfined meadow. Overall, Lee Vining Creek is moderately confined in this reach and the stream width narrows near Poole Powerhouse. Dominant substrate types within the reach are primarily cobble and boulder substrate; however, the low-gradient habitat types in the reach primarily contained sand, silt, and gravel substrates (Figure 6.5-20).

Table 6.5-7. Stream Habitat-Typing Summary for Lee Vining Creek Between Poole Powerhouse and the LADWP Diversion Dam, 2023

Habitat Type	Total Length (feet)	Length Relative Frequency (%)	Number of Units	Unit Relative Frequency (%)	Average Width (feet)	Average Pool Depth (feet)
Cascade	2,248	6.5	9	4.1	26.7	--
Fall	111	0.3	3	1.4	50.0	--
High-gradient riffle	8,056	23.3	39	17.7	24.5	--
Low-gradient riffle	4,934	14.3	36	16.4	28.3	--
Run	7,987	23.1	47	21.4	23.8	--
Step run	6,311	18.2	29	13.2	23.7	--
Scour pool	3,656	10.6	45	20.5	29.3	3.9
Dammed pool	1,295	3.7	12	5.5	58.3	4.2
Total	34,598	100.0	220	100.0	--	--

% = percent; -- = no data

Glacier Creek between Tioga Dam and the confluence of Lee Vining Creek consists of similar amounts of low- and high-gradient riffle, run, and pool habitats (Table 6.5-8).The stream channel is largely unconfined and is relatively narrow throughout the reach, except for a nearly 300-foot-wide ponded section located approximately 0.7 mile upstream of the confluence with Lee Vining Creek. Dominant substrate types consist primarily of cobble and boulder, although large gravel deposits were present within the low-gradient habitats throughout the reach (Figure 6.5-20).

Table 6.5-8. Stream Habitat-Typing Summary for Glacier Creek Between Tioga Dam and the Confluence of Lee Vining Creek, 2023

Habitat Type	Total Length (feet)	Length Relative Frequency (%)	Number of Units	Unit Relative Frequency (%)	Average Width (feet)	Average Pool Depth (feet)
Cascade	190	4.3	3	7.7	11	--
Fall	67	1.5	1	2.6	7	--
High-gradient riffle	902	20.4	6	15.4	9	--
Low-gradient riffle	1,291	29.2	11	28.2	13	--
Run	731	16.5	8	20.5	15	--
Step run	539	12.2	3	7.7	9	--
Scour pool	696	15.8	7	17.9	52	3.4
Total	4,416	100.0	39	100.0	--	--

% = percent; -- = no data

SPAWNING GRAVEL

Spawning gravel is present in most Project-affected stream reaches except for upper Lee Vining Creek between Saddlebag Dam and the confluence of Slate Creek, which did not have any suitable spawning gravel in 2023 (Table 6.5-9 and Figure 6.5-21). Spawning gravel total area and volume is highest in upper Lee Vining Creek between Slate Creek and Ellery Lake, followed by lower Lee Vining Creek between Poole Powerhouse and the LADWP Diversion Dam (Table 6.5-9).Average gravel quality was greatest in Glacier Creek followed by upper Lee Vining Creek between the confluence of Slate Creek and Ellery Lake (Table 6.5-9).

Table 6.5-9. Total Gravel Area, Volume, Average Quality, and Abundance by Study Reach for Lee Vining and Glacier Creeks, 2023

Reach	Reach Length (miles)	Total Spawning Gravel Area (ft^2)	Total Spawning Gravel Volume (ft^3)	Average Quality Score (1–4)	Abundance (ft^2/mile)
Upper Lee Vining Creek between Saddlebag Dam and the confluence of Slate Creek	0.6	0	0	--	0
Upper Lee Vining Creek between the confluence of Slate Creek and Ellery Lake	3.1	18,640	1,193	2.5	6,013

Reach	Reach Length (miles)	Total Spawning Gravel Area (ft^2)	Total Spawning Gravel Volume (ft^3)	Average Quality Score (1–4)	Abundance (ft^2/mile)
Lower Lee Vining Creek between Poole Powerhouse and the LADWP Diversion Dam	6.6	7,309	404	1.8	1,107
Glacier Creek between Tioga Dam and the confluence of Lee Vining Creek	0.8	1,998	169	3.1	2,498

-- = no data; ft^2 = square feet; ft^3 = cubic feet; LADWP = Los Angeles Department of Water and Power

Spawning gravel quality was generally higher in stream reaches above Ellery Lake when compared to lower Lee Vining Creek downstream of Poole Powerhouse. Spawning gravel patches downstream of Poole Powerhouse were typically patchy and moderately armored and embedded with very fine gravel and coarse sand. Lower Lee Vining Creek flows through glacial till and moraines that supply abundant fine sediment (sand and finer) and gravel to the channel. Flow fluctuations downstream of Poole Powerhouse regularly mobilize these finer particles, leading to increased embeddedness and armoring of gravel patches.

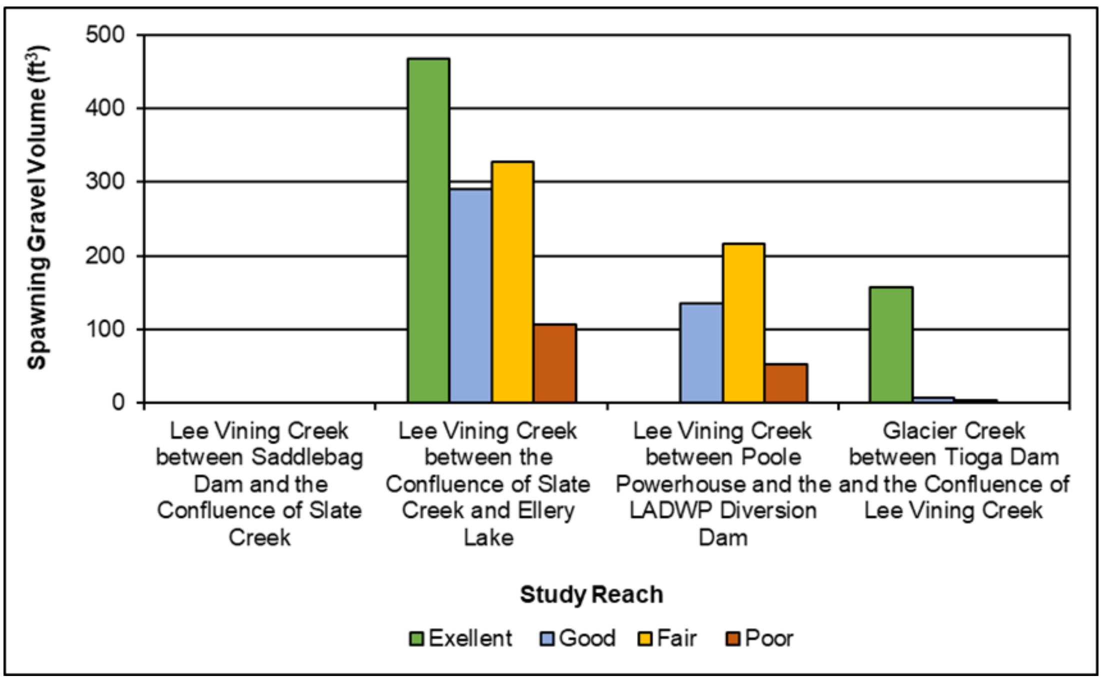


Figure 6.5-21. Spawning Gravel Volume by Quality in Project-Affected Stream Reaches of the Lee Vining Creek Hydroelectric Project, 2023.

<u>FISH PASSAGE BARRIERS</u>

Six barriers to fish movement[8] occur in Project-affected stream reaches (Table 6.5-10). Most of these features were natural bedrock waterfalls or cascades, with the exception of culverts located under State Route 120 (also referred to as Tioga Pass Road) on Lee Vining and Glacier Creeks.

Table 6.5-10. Passage Barriers Identified in Project-Affected Stream Reaches, 2023

Reach	Unit Number	Reach Mile	Habitat Type	Description
Lee Vining Creek between Saddlebag Dam and the confluence of Slate Creek	93	0.3	Cascade	Series of cascades and small bedrock falls
Lee Vining Creek between the confluence of Slate Creek and Ellery Lake	14	2.8	Scour Pool	Large culvert under State Route 120 may pose velocity barrier at high flows
Lee Vining Creek between Poole Powerhouse and the LADWP Diversion Dam	140	1.9	Falls	Large bedrock falls
	166	1.1	Falls	Large bedrock falls
Glacier Creek between Tioga Dam and the confluence of Lee Vining Creek	18	0.6	Low-gradient riffle	Three parallel culverts under State Route 120 may pose velocity barrier at high flows
	25	0.4	Falls	Large bedrock falls

LADWP = Los Angeles Department of Water and Power

<u>AQUATIC INVASIVE PLANTS AND ALGAE</u>

No invasive aquatic algae or plant species were documented during the September 2023 surveys or incidentally during other relicensing surveys in 2022 or 2023, including in the reach of Lee Vining Creek where *Didymo (Didymosphenia geminate)* was historically documented in 2005 and 2006 by Rost and Fritsen (2014).

6.5.1.5. Large Woody Debris

Lee Vining Creek between Saddlebag Dam and the confluence of Slate Creek has occasional but infrequent accumulations of large woody debris (Salamunovich, 2017b). Lee Vining Creek between the confluence of Slate Creek and Ellery Lake had infrequent accumulations of large woody debris during the September 2023 habitat mapping surveys. Lower Lee Vining Creek between Poole Powerhouse and Big Bend Campground has frequent large woody debris jams with numerous pieces greater than 30 inches diameter at breast height and appear to be relatively stable and persistent (see the *Lower Lee Vining Creek Channel Morphology [AQ-6] Final Technical Report*, which is included in Volume III of this DLA). Glacier Creek between Tioga Dam and the confluence of Lee

[8] Three species of trout occur in the study area, of which all are non-migratory, resident species.

Vining Creek had occasional but infrequent accumulations of large woody debris during the September 2023 habitat mapping surveys.

6.5.1.6. Entrainment

The Project has an unscreened intake structure to Poole Powerhouse at the base of Rhinedollar Dam. Although a fish screen was requested by CDFW in 1992, FERC did not consider potential entrainment losses to be significant enough to recommend the installation of a fish screen on the Poole Powerhouse intake (FERC, 1992). While unscreened intakes can cause involuntary entrainment and turbine mortality for fish, entrainment risk primarily occurs at higher approach velocities (i.e., 2 feet per second [fps]; FERC, 1992). The intake to Poole Powerhouse has an approach velocity of approximately 0.5 fps (FERC, 1992), which is lower than the cruising speeds of both juvenile (approximately 2 fps) and adult (approximately 3 fps) trout (Bell, 1991). Therefore, it is likely that juvenile and adult trout can easily escape the intake flow field. Additionally, the introduced brown and hatchery rainbow trout residing in Ellery Lake are nonmigratory species that may make random movements in the vicinity of the intake but do not make population-scale migrations and therefore are not likely to become entrained in large numbers.

6.5.1.7. Benthic Macroinvertebrates

There are several sources of benthic macroinvertebrate (BMI) data for sites in the study area, including samples collected from Lee Vining Creek, Glacier Creek, and leakage zones below Saddlebag Lake (Table 6.5-11). Sample collection (e.g., targeted-riffle, reach-wide benthic, triplicate sample methods, D-frame kicknet) and analytical methodologies varied among studies. Although individual metrics (e.g., taxonomic richness, composition, tolerance, and functional feeding groups) and/or multi-metric index scores (e.g., the California Stream Condition Index [CSCI]) commonly used to characterize BMI samples may not have been calculated or are not readily obtainable, taxonomic data of subsampled BMI is available for Lee Vining and Glacier Creeks. For example, data from the California Environmental Data Exchange Network (CEDEN, 2020) only includes identified taxa, whereas data available from Herbst and Medhurst (2010), Rost and Fritsen (2014), and Cohen (2019) include descriptive metrics. Data available from samples collected as part of the Perennial Streams Assessment (SWRCB, 2020) include CSCI scores, which are derived via a multi-part evaluation that uses a statewide reference database to integrate observed-to-expected ratios of BMI taxonomic completeness and multi-metric indices into a composite score indicative of stream condition (Rehn et al., 2015).

CSCI scores available for two sites on Lee Vining Creek—Site LVMC (CSCI=1.09) and Site LVWF (CSCI=1.17)—exceed the threshold for the highest condition category of the score (Rehn et al., 2015; SWRCB, 2020). This suggests that stream conditions and quality of aquatic habitat in the study area downstream of Poole Powerhouse is generally suitable for BMIs and comparable with unimpaired reference conditions. This is supported by studies that compare stream reaches below reservoirs, including sites within the study area (Table 6.5-11), and streams not affected by hydroelectric operations. Cohen (2019) found that BMI community structure (i.e., richness, evenness, density, and composition) in outlet streams of reservoirs and high-elevation natural lakes were similar despite differences in flow and nutrient (e.g., ammonium) concentrations. Rost and Fritsen (2014) found that BMI assemblages in Lee Vining Creek were generally unimpaired but noted higher densities of BMIs at Site LVSR compared to Site LVSC and Slate Creek (Table 6.5-11), which was attributed to higher periphyton biomass caused by the invasive diatom *Didymo*. Samples collected from leakage zones below Saddlebag Lake (Herbst and Medhurst, 2010) determined that these areas support lower BMI diversity and are not high-quality habitat compared to regional unimpaired streams.

Table 6.5-11. Benthic Macroinvertebrate Sample Sites in the Project Stream Reaches

<table>
<tr><th rowspan="2">Waterbody Name</th><th rowspan="2">Site Location Description</th><th rowspan="2">Site Code</th><th colspan="2">Coordinates [a]</th><th rowspan="2">Sampling Year(s)</th><th rowspan="2">Collection Agency or Institution</th><th rowspan="2">Data Source(s)</th></tr>
<tr><th>Latitude</th><th>Longitude</th></tr>
<tr><td rowspan="7">Lee Vining Creek</td><td>Approximately 3.1 miles below Poole Powerhouse at Moraine Camp (SWRCB Station Code 601LVC001)</td><td>LVMC</td><td>37.9300</td><td>-119.1640</td><td>2000</td><td>SNARL</td><td>CEDEN, 2020
SWRCB, 2020</td></tr>
<tr><td>Approximately 0.9 mile below Warren Fork (SWRCB Station Code 601PS0065)</td><td>LVWF</td><td>37.9451</td><td>-119.2040</td><td>2011</td><td>CDFW ABL</td><td>CEDEN, 2020
SWRCB, 2020</td></tr>
<tr><td rowspan="3">Below Saddlebag Lake outlet [b]</td><td rowspan="3">LVSR</td><td rowspan="3">37.9649</td><td rowspan="3">-119.2738</td><td>2016, 2017</td><td>UCSB</td><td>Cohen, 2019</td></tr>
<tr><td>2010</td><td>SNARL</td><td>Herbst and Medhurst, 2010</td></tr>
<tr><td>2005, 2006</td><td>SNC and DRI</td><td>Rost and Fritsen, 2014</td></tr>
<tr><td>Below the confluence of Slate Creek [b]</td><td>LVSC</td><td>37.9586</td><td>-119.2729</td><td>2005, 2006</td><td>SNC and DRI</td><td>Rost and Fritsen, 2014</td></tr>
<tr><td>Lee Vining Creek below Ellery Lake outlet</td><td>LVEL</td><td>37.9353</td><td>-119.2316</td><td>2016, 2017</td><td>UCSB</td><td>Cohen, 2019</td></tr>
<tr><td>Slate Creek</td><td>Upstream of the confluence of Lee Vining Creek</td><td>Unimpaired</td><td>37.9592</td><td>-119.2786</td><td>2005, 2006</td><td>SNC and DRI</td><td>Rost and Fritsen, 2014</td></tr>
<tr><td>Glacier Creek</td><td>Glacier Creek 50 meters below Tioga Dam</td><td>GCTL</td><td>37.9285</td><td>-119.2508</td><td>2015, 2016, 2017</td><td>UCSB</td><td>Cohen, 2019</td></tr>
<tr><td>Leakage zones below Saddlebag Dam</td><td>Reservoir leakage sites below Saddlebag Lake outlet [b]</td><td>SRRL</td><td>37.9653</td><td>-119.2731</td><td>2010</td><td>SNARL</td><td>Herbst and Medhurst, 2010</td></tr>
</table>

ABL = Aquatic Bioassessment Lab; CDFW = California Department of Fish and Wildlife; DRI = Desert Research Institute; SNARL = Sierra Nevada Aquatic Research Laboratory; SNC = Sierra Nevada College; SWRCB = State Water Resources Control Board; UCSB = University of California Santa Barbara

[a] Datum = North American Datum of 1983 (NAD 83)

[b] Approximate location based on description of reach (coordinates were not included in associated publication).

6.5.2. Potential Adverse Effects and Issues

6.5.2.1. Effects of Project Operations on Quantity and Quality of Aquatic Habitat for Fish Populations within Project-Affected Stream Reaches

Aquatic habitat quality within Project-affected stream reaches is generally excellent and provides adequate habitat for all life stages of trout (see the AQ-3 Final Technical Report, which is included in Volume III of this DLA). Upper Lee Vining Creek between Saddlebag Dam and the confluence of Slate Creek is generally high gradient and dominated by cascade and high-gradient riffle habitat with abundant cover and velocity refugia in the form of boulder cover. The other Project-affected stream reaches contain high frequencies of pool habitat and abundant cover in the form of large woody debris and boulders. Additionally, high frequencies of riffle habitat provide adequate habitat conditions for BMIs.

Current MIF releases were informed by prior instream flow studies (including Physical Habitat Simulation) conducted in upper Lee Vining Creek (EA, 1986) and lower Lee Vining Creek (Groves Energy Company, 1984). Historical Physical Habitat Simulation studies were conducted in four reaches, which continue to be generally dominated by bedrock, boulder, and cobble morphology and high-gradient canyon sections (AQ-3 Final Technical Report [DLA Volume III]) that tend to prevent habitat-flow relationships from shifting significantly over time. Because habitat changes in response to flow in Project-affected reaches are relatively insensitive, historical habitat-flow relationships were used to evaluate weighted usable area (WUA) (expressed as percent of maximum) as a function of streamflow in Lee Vining Creek during wet, normal, and dry water year types (Appendix E.3, *Habitat-Flow Analysis*). For illustrative purposes, Figures 6.5-22 through 6.5-25 show monthly percent maximum WUA during normal water years for brown and brook trout in upper and lower Lee Vining Creek (results for all water year types are reported in Appendix E.3, *Habitat-Flow Analysis*).

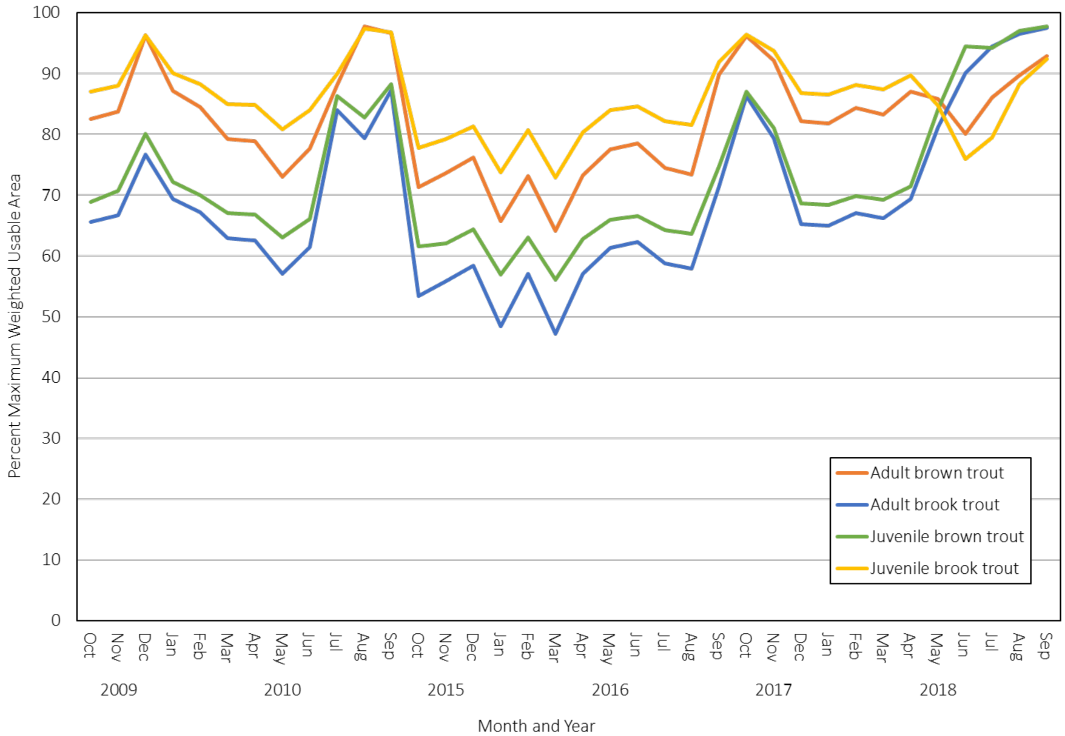


Figure 6.5-22. Monthly Percent Maximum WUA During Normal Water Years in Lee Vining Creek from Saddlebag Lake to the Confluence with Slate Creek.

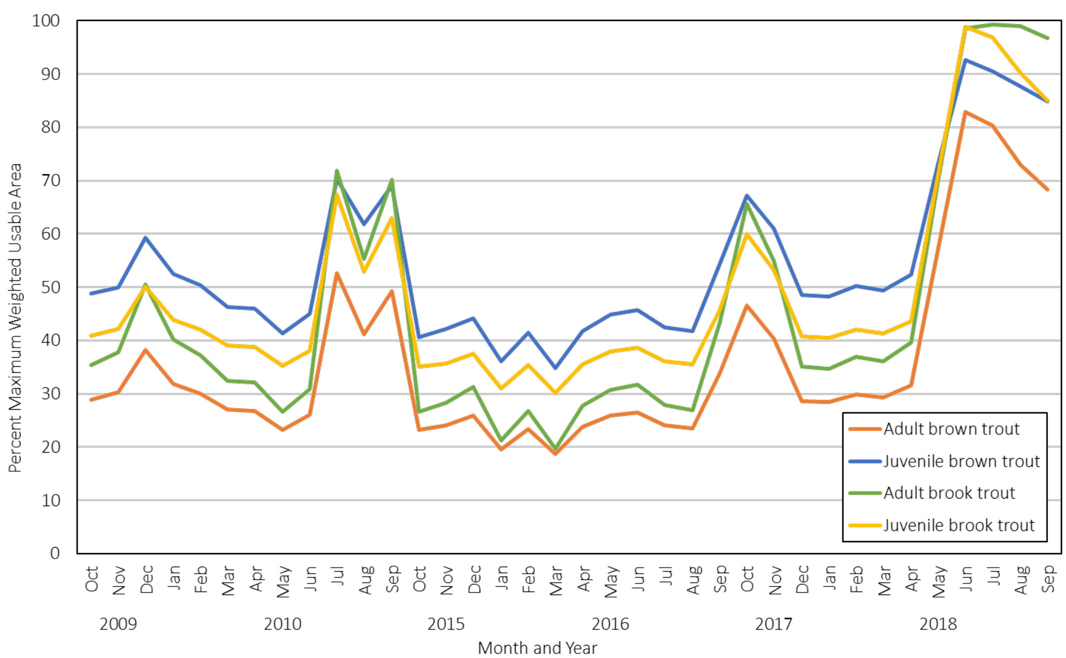


Figure 6.5-23. Monthly Percent Maximum WUA During Normal Water Years in Lee Vining Creek from the Confluence with Slate Creek to the Confluence with Glacier Creek.

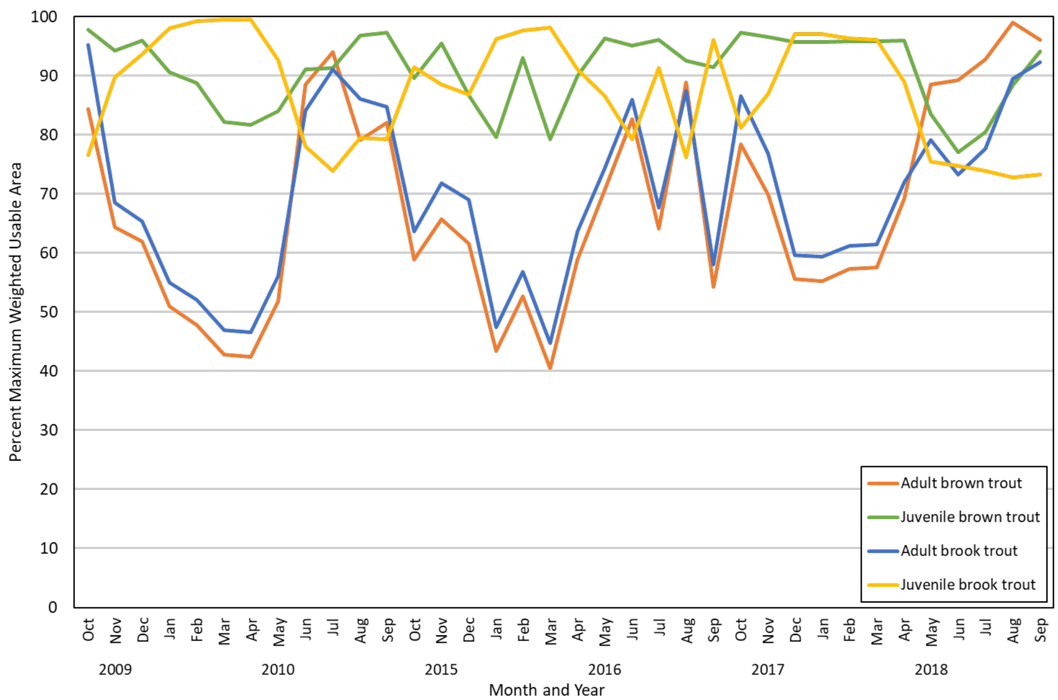


Figure 6.5-24. Monthly Percent Maximum WUA During Normal Water Years in Lee Vining Creek Between the Confluence of Glacier Creek and Ellery Lake.

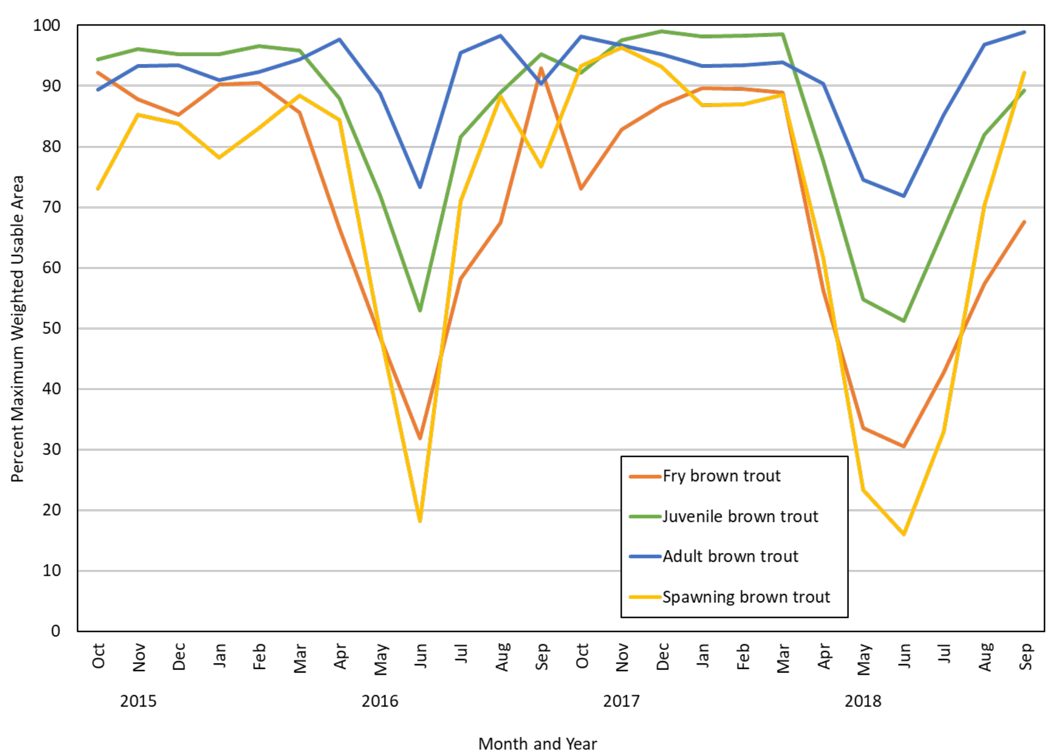


Figure 6.5-25. Monthly Percent Maximum WUA During Normal Water Years in Lower Lee Vining Creek Between Poole Powerhouse and the LADWP Diversion Dam.

Consistent with USFS Condition No. 4 of the current license, SCE provides MIFs to protect the recreational fishery within Project-affected stream reaches and meet USFS recreational objectives for Project reservoirs (see Section 6.4.1, *Affected Environment*). Monthly flows for Lee Vining Creek below Saddlebag Dam are determined bi-annually in consultation with USFS. If SCE and USFS do not agree on flows, the following MIFs from the current license apply year-round for this reach: 14 cfs for wet years, 9 cfs for normal years, and 6 cfs for dry years. Between August and May, minimum flow requirements below Rhinedollar Dam are 27 cfs or the natural flow, whichever is less. In June and July, the minimum flow is 89 cfs or natural flow, whichever is less. Minimum flow requirements below Tioga Dam depend on water year, inflow, and month. From December to April, the minimum flow is equal to the natural inflow. In October and November, the minimum flow is 2 cfs or natural inflow. From May to September, the minimum flow depends on water year and inflow.

Project operations influence coarse sediment transport through Project-affected stream reaches (see Section 6.3, *Geology and Soils*), which in turn influences the availability of gravel that is a key element of spawning habitat availability. Spawning gravel for trout species includes a sediment size composition between 0.2 and 3.9 inches located in an area with adequate water depth and velocity (i.e., greater than 9.4 inches and 15.7 to 35.8 inches per second, respectively) during flows with a recurrence interval of up to 1.5 years (Bjornn and Reiser, 1991). Spawning gravel surveys were conducted during the AQ-3 Study to assess the quantity and quality of mobile coarse sediment of suitable size available to spawning fish in Project-affected stream reaches.

Spawning gravel is present in most Project-affected stream reaches, subject to local sediment supply and transport conditions (see the AQ-3 Final Technical Report, included in Volume III of this DLA). In the high-gradient, high-elevation reach of upper Lee Vining Creek between Saddlebag Dam and the confluence of Slate Creek, sediment transport is high and sediment supply is limited, resulting in little or no spawning gravel. Saddlebag Lake, Ellery Lake, and Tioga Lake are naturally occurring lakes that existed prior to construction of the Project and historically trapped coarse sediment delivered from upstream source areas (see Section 6.3, *Geology and Soils*). Spawning gravel total area and volume were highest in upper Lee Vining Creek between Slate Creek and Ellery Lake followed by lower Lee Vining Creek between Poole Powerhouse and the LADWP Diversion Dam (Table 6.5-12). The highest abundance of spawning gravel was observed in upper Lee Vining Creek between the confluence of Slate Creek and Ellery Lake, followed by Glacier Creek (Table 6.5-12). Average gravel quality was highest in Glacier Creek followed by upper Lee Vining Creek between the confluence of Slate Creek and Ellery Lake (Table 6.5-12). In upper Lee Vining Creek between the confluence of Slate Creek and Ellery Lake, spawning gravel patch abundance and quality were highest in the last 1.6 miles of the reach, with large excellent quality spawning gravel patches present in the large low-gradient meadow sections. Spawning gravel in lower Lee Vining Creek decreased in abundance from upstream to downstream, but the quality was lower in the upstream section of the reach. In Glacier Creek, large, deep deposits of excellent and good quality spawning gravel were evenly distributed throughout the reach.

Table 6.5-12. Total Spawning Gravel Area, Volume, Average Quality, and Abundance by Study Reach for Lee Vining and Glacier Creeks

Reach	Reach Length (miles)	Total Spawning Gravel Area (ft^2)	Total Spawning Gravel Volume (ft^3)	Average Quality Score (1–4)	Abundance (ft^2/mile)
Upper Lee Vining Creek between Saddlebag Dam and the confluence of Slate Creek	0.6	0	0	--	0
Upper Lee Vining Creek between the confluence of Slate Creek and Ellery Lake	3.1	18,640	1,193	2.5	6,013
Lower Lee Vining Creek between Poole Powerhouse and the LADWP Diversion Dam	6.6	7,309	404	1.8	1,107
Glacier Creek between Tioga Dam and the confluence of Lee Vining Creek	0.8	1,998	169	3.1	2,498

-- = no data; ft^2 = square feet; ft^3 = cubic feet; LADWP = Los Angeles Department of Water and Power

Overall, the results of the AQ-3 Study suggest current Project operations have little effect on spawning habitat and reproductive success in Project reservoirs due to the abundance of suitable spawning gravel patches throughout Project-affected stream reaches. Furthermore, trout populations within Project-affected stream reaches exhibit signs of successful and regular recruitment, indicating that instream flow releases and current spawning gravel distribution under current and proposed Project operations support suitable spawning habitat conditions for trout and are not believed to significantly and adversely affect fish populations in Project-affected stream reaches.

Trout captured during the AQ-2 Study in Lee Vining and Glacier Creeks were in good condition as indicated by a mean condition factor[9] of 1.2 for rainbow trout, 1.0 for brook trout, and 1.1 for brown trout (Table 6.5-13). Condition factors reflect a healthy nutritional state of fish related to size and growth based on habitat conditions, including water temperature, water quality, flow, and food resources. Furthermore, condition factors for trout captured at study sites located between Saddlebag Dam and the confluence of Slate Creek are similar to those reported during prior fish population surveys (Salamunovich, 2021), suggesting no recent changes in the nutritional state of fish.

[9] The typical mean condition factors for wild trout range from 0.8 to 1.2 (Beak, 1991; EA, 1987; Ebasco Environmental, 1993; Wilcox, 1994); however, condition is dependent on the sampling season, species, strain of trout, state of sexual maturity, and the way fish length is defined (e.g., fork length, total length, or standard length), which is not often documented with the results.

Table 6.5-13. Trout Nutritional State (k-value) Calculated for Fish Captured During Fish Population Studies in Lee Vining and Glacier Creeks

Stream	Study Site	Trout Species	Survey Year		
			2016	2021	2022
			Mean k-value		
Lower Lee Vining Creek	LLVC-F1	Rainbow trout	--	--	1.15
		Brook trout	--	--	0.99
		Brown trout	--	--	1.09
Upper Lee Vining Creek between the confluence of Slate Creek and Ellery Lake	ULVC-F1	Brook trout	--	--	0.96
		Brown trout	--	--	1.05
	ULVC-F2	Brook trout	--	--	1.09
		Brown trout	--	--	1.07
Upper Lee Vining Creek between Saddlebag Dam and the confluence of Slate Creek	ULVC-F3	Brook trout	1.06	1.00	1.04
		Brown trout	1.09	1.08	1.08
	ULVC-F4	Brook trout	1.08	1.02	0.95
		Brown trout	1.09	1.05	1.08
	ULVC-F5	Brook trout	1.05	1.01	0.96
		Brown trout	1.09	1.05	1.08
Glacier Creek	GLC-F1	Brook trout	--	--	1.04
		Brown trout	--	--	1.10

Sources: Salamunovich, 2017a and 2021

-- = no data

Fish populations in Lee Vining and Glacier Creeks are dominated by brown trout across all study sites, followed by brook trout (AQ-2 Study). Only two rainbow trout and one cutthroat trout–rainbow trout hybrid were captured during sampling in 2022, both of which were captured in lower Lee Vining Creek. Trout abundance, density, and biomass at study sites in upper Lee Vining Creek between Saddlebag Dam and the confluence of Slate Creek in 2022 were similar to those reported during prior fish population surveys (Table 6.5-14). Additionally, 2022 trout biomass estimates in upper Lee Vining Creek and lower Lee Vining Creek below Poole Powerhouse exceeded those reported for the same reaches during relicensing studies conducted from 1986 to 1987 (EA, 1992). Trout abundance estimates in 2022 ranged from 2,256 to 4,136 fish per mile across sample sites and average estimated abundance for all trout was highest in Glacier Creek, while the lowest abundances were observed in lower Lee Vining Creek (AQ-2 Study).

Table 6.5-14. Average Abundance, Density, and Biomass Estimates for Naturally Reproducing Trout (Brown and Brook) in Lee Vining Creek, 1984–2022

Survey Year [a]	Abundance (trout/mile)	Density (trout/m^2)	Biomass (g/m^2)
Lee Vining Creek between Saddlebag Dam and the confluence of Slate Creek			
1986 & 1987[b]	--	--	8.3
1999	998	0.14	6.8
2000	601	0.12	4.1
2001	735	0.11	4.2
2006	1,159	0.16	8.9
2011	880	0.02	1.1
2016	3,525	0.43	13.4
2021	2,828	0.33	7.5
2022	2,980	0.30	8.5
Average	1,713	0.20	6.9
Upper Lee Vining Creek between the confluence of Slate Creek and Ellery Lake			
1984, 1986, and 1987[b]	--	--	7.2
2022[c]	3,763	0.30	9.2
Average	--	--	8.2
Lower Lee Vining Creek			
1984, 1986 & 1987[b, d]	--	--	6.7
2022[d]	2,189	0.15	7.0
Average	--	--	6.8

Sources: EA, 1992; Sada, 2007; Sada and Hogle, 2011; Salamunovich, 2017a and 2021

-- = no data; g/m^2 = grams per square meter
[a] Fish surveys were conducted in spring, summer, and fall from 1999 to 2001, and in the fall of every fifth year thereafter (2006, 2011, and 2016), with the exception of 2022.
[b] Biomass estimates reported as a composite for multiple survey years.
[c] Estimates for 2022 are reported as combined averages for sites ULVC-F1 and ULVC-F2.
[d] Estimates are for brown trout only.

Fish density estimates for all trout ranged between 0.19 and 0.69 trout/m^2, while estimates were generally more similar between sites in upper Lee Vining Creek ranging from 0.27 to 0.34 trout/m^2 (AQ-2 Study). Brown trout densities generally drove overall densities, ranging between 0.15 and 0.51 trout/m^2 compared to 0.01 to 0.18 trout/m^2 for brook trout. Estimated densities by study reach were highest for both brook and brown trout in Glacier Creek. Estimated overall biomass varied by sample site, ranging between 4.85 and 25.63 g/m^2 across sample sites. Brown trout biomass drove overall biomass at some sites. Average biomass by study reach was highest for both species in Glacier Creek, followed by lower Lee Vining Creek, likely due to the large size of the stocked rainbow and cutbow trout captured (AQ-2 Study). Overall, the average estimated abundance, density, and biomass of trout populations for Project-affected stream reaches exceed or are comparable to the average abundance of those reported for similar sized streams within the Mono, Owens, and greater Sierra Nevada region (Salamunovich, 2017a).

Reductions in streamflows, like those that occur during Hydro-resource Optimization at Poole Powerhouse, have the potential to strand emergent life stages of naturally reproduced brown and brook trout in lower Lee Vining Creek during spring months (February through May) when their swimming abilities are most limited. Stranding risk is highest when reductions in water surface elevations (stage) are rapid, shoreline slopes and stream gradient are shallow, and topographic depressions create isolated pools and substrate is heavily structured (e.g., cobble and boulder dominated substrate with larger interstitial space). Substrate composition is most structured and pose the greatest stranding risk in the upper section of the reach near Big Bend Campground where gravel, cobble, and boulder substrates dominate, compared to downstream where smaller substrates of sand and gravel are more common (see the AQ-6 Final Technical Report, which is included in Volume III of this DLA). Under current operations, streamflows in spring vary between about 10 to 70 cfs.

Hydrologic Engineering Center's River Analysis System modeling was conducted at cross sections evaluated in Study AQ-6 to assess change in stage over the flow range when emergent trout are most susceptible to stranding (10 to 70 cfs in February through May). Cross sections were from representative habitats near Big Bend Campground, Aspen Campground, and lower Lee Vining Creek Campground. Lower Lee Vining Creek does not include large floodplains or frequent cobble bars. During hydropeaking, flows remain within the regularly wetted channel between well-defined banks. Model output indicates average water depth increases by approximately 9 inches at all sites when flows range from about 10 to 70 cfs (Table 6.5-15).

Table 6.5-15. Modeled Water Depth at Channel Morphology Cross Sections in Lower Lee Vining Creek

Flow (cfs)	Water Depth (feet)								
	Near Big Bend Campground (n=6)			Near Aspen Campground (n=4)			Near Lower Lee Vining Creek Campground (n=3)		
	Minimum	Maximum	Average	Minimum	Maximum	Average	Minimum	Maximum	Average
10	0.4	1.4	0.8	0.4	1.2	0.8	0.6	0.7	0.7
20	0.5	1.7	1.0	0.5	1.4	1.0	0.8	0.9	0.9
30	0.5	1.9	1.1	0.6	1.6	1.2	0.9	1.1	1.0
40	0.6	2.1	1.3	0.7	1.7	1.3	1.0	1.2	1.1
50	0.7	2.3	1.4	0.8	1.8	1.4	1.1	1.3	1.2

Flow (cfs)	Water Depth (feet)								
	Near Big Bend Campground (n=6)			Near Aspen Campground (n=4)			Near Lower Lee Vining Creek Campground (n=3)		
	Minimum	Maximum	Average	Minimum	Maximum	Average	Minimum	Maximum	Average
60	0.8	2.4	1.5	0.8	1.8	1.5	1.2	1.4	1.3
70	0.8	2.6	1.6	0.9	1.9	1.6	1.2	1.4	1.4

cfs = cubic feet per second

Since streamflows stay within the regularly wetted channel width over the range of flows, between well-defined banks, with modest increases in stage and without a preponderance of cobble margins or bars, the potential for stranding emerged brown and brook trout appears to be small. As described above, the fish population results from Study AQ-2 show a typical age-class distribution with evidence of regular and successful recruitment brown and brook trout in lower Lee Vining Creek. Thus, the physical, biological, and hydraulic data all suggest that stranding is not a significant issue. Further, no stranding has ever been documented by SCE or by any of the agencies or other stakeholders in reference material compiled in the pre-application document. Therefore, Hydro-resource Optimization does not appear to be having a significant adverse effect on emergent young-of-year in lower Lee Vining Creek during spring months when they are most vulnerable.

NO ACTION

Under the No Action, SCE would continue to operate and maintain the Project in accordance with the terms and conditions of the existing FERC license. Existing Project O&M activities do not appear to be having any significant, adverse effects on the quantity or quality of aquatic habitat or on fish populations in Project-affected stream reaches. Because the No Action would include SCE's continued implementation of USFS Condition No. 4 of the current license (78 FERC ¶ 61,110)—which will maintain MIF releases dependent on season and water year type to maintain adequate habitat and water quality conditions to protect the recreational fishery in Project-affected stream reaches—no adverse effects of the No Action are anticipated.

PROPOSED ACTION

Based on the analysis discussed above, the results of the aquatics studies, and because the Proposed Action does not include changes to O&M activities, no adverse effects have been identified for Proposed Action.

6.5.2.2. Effects of Project Operations on Populations of Invasive Aquatic Algae in Project-Affected Stream Reaches

Project O&M activities are unlikely to introduce invasive aquatic algal species, such as *Didymo*, to Project reservoirs or Project-affected stream reaches. Project operations do not use water from outside the watershed, precluding the introduction of invasive species in contaminated water. Additionally, implementation of best management practices during routine maintenance activities (e.g., regularly cleaning equipment) and avoidance and minimization measures in SCE's *Invasive Mussel Prevention Plan* (SCE, 2017) would protect against potential introduction of invasive aquatic algae.

Project-regulated instream flows have the potential to affect the distribution and abundance of any invasive algae that may be present in the watershed. However, surveyors did not observe invasive aquatic algae in surveys throughout all Project-affected stream reaches during AQ-4 Study in 2023, despite observations made in 2006 of *Didymo* in Lee Vining Creek near the confluence of Slate Creek (Rost and Fritsen, 2014).

High peak flow rates in Project-affected stream reaches may have removed masses of previously observed *Didymo*, and extended snow cover and short growing seasons in the high-elevation FERC Project Boundary (e.g., greater than10 inches at Saddlebag Dam in July 2023; NOAA, 2024) may have inhibited its growth and survival (Whitton et al., 2009). Nevertheless, if *Didymo* is currently present or becomes established in Project-affected stream reaches, Project operations are unlikely to support its spread because variable flow rates are unfavorable to *Didymo* (Whitton et al., 2009).

Based on the results of Study AQ-4 indicating *Didymo* may no longer be or is infrequently present in Project-affected stream reaches, and because the Proposed Action does not include operational changes, the Project is unlikely to result in adverse effects associated with the introduction or spread of aquatic invasive algae.

NO ACTION

Under the No Action, SCE would continue to operate and maintain the Project in accordance with the terms and conditions of the existing FERC license. Because existing information indicates Project operations do not appear to be contributing to or increasing potential for invasive aquatic plants or *Didymo* in Project-affected streams, the No Action is unlikely to result in adverse effects relating to invasive aquatic plants or *Didymo*.

PROPOSED ACTION

Based on the analysis discussed above, the results of the aquatics studies, and because the Proposed Action does not include changes to O&M activities, no adverse effects have been identified for Proposed Action.

6.5.2.3. Effects of Project Operations on the Condition of Recreational Fisheries within Project Reservoirs

The CDFW regularly plants sterile, nonreproducing, hatchery raised rainbow trout in Project reservoirs to support a put and take fishery management strategy. Prior to 2020, CDFW planted 3,560 to 13,150 catchable sized rainbow trout (i.e., larger than 0.5 pound each) in each of the three Project reservoirs on an annual basis. No trout were planted in Project reservoirs in 2020 due to the COVID19 pandemic and only sub-catchable rainbow trout were planted in Ellery and Tioga Lakes in 2021 (CDFW records as cited in

Salamunovich, 2021). Fish planting by CDFW did not occur in Project reservoirs in 2022 due to a disease outbreak at CDFW hatcheries. Records of fish stocking by other entities during 2022 could not be obtained prior to this report but was likely limited in numbers and only occurred in Tioga Lake (personal communication, Tioga Lake Campground Camp Host, August 3, 2022).

Project reservoirs are comprised of coldwater nonnative species, including brook trout, brown trout, and rainbow trout in Ellery Lake; brook trout and rainbow trout in Tioga Lake; and brook trout and Lahontan redside in Saddlebag Lake. Of the trout species observed, brown trout were the most abundant in Ellery Lake while brook trout were the most abundant in Tioga and Saddlebag Lakes. Rainbow trout were the least abundant trout species observed in Ellery and Tioga Lakes, and no rainbow trout were captured in Saddlebag Lake. The low abundance of rainbow trout is likely a result of no planting by CDFW in the three Project reservoirs during 2022. Rainbow trout abundance in Project reservoirs is primarily a balance of planting by CDFW and angling exploitation or other mortality, thus the abundance of adult rainbow trout in Project reservoirs is arbitrary and a function of recreational fishery management.

The mean trout condition (k-value) within the Project reservoirs sampled in 2022 ranged from 0.92 to 1.28, indicating that trout were generally in good condition (Table 6.5-16). Length and weight data for all fish captured during this study are provided in the AQ-1 Final Technical Report, which is included in Volume III of this DLA.

Table 6.5-16. Nutritional State of Trout in Project Reservoirs During August 2022

Project Reservoir	Species	Number Captured	Fork Length (mm)		Average k-value
			minimum	maximum	
Ellery Lake	Brook trout	9	43	310	1.28
	Brown trout	22	137	388	1.10
	Rainbow trout	2	225	287	0.92
Tioga Lake	Brook trout	30	114	269	1.06
	Rainbow trout	12	220	425	1.24
Saddlebag Lake	Brook trout	43	160	364	1.13

k-value = mean trout condition; mm = millimeter

Water quality within Project reservoirs is well within the tolerance range of salmonids (i.e., less than 20°C and greater than 7 mg/L for temperature and DO, respectively), with high DO levels, cold water temperatures, and suitable pH levels (Section 6.4.1.7, *Water Quality*). Furthermore, the majority of fish captured within Project reservoirs during the AQ-1 Study were in good condition, with an average condition factor of 1.12, which is generally consistent with mean historic k-value of 1.15 for trout in Project reservoirs (EA, 1987b).

NO ACTION

Under the No Action, SCE would continue to operate and maintain the Project in accordance with the terms and conditions of the existing FERC license, including continued support of CDFW's fish stocking in Ellery Lake. Because existing information indicates fish populations in Project reservoirs are not adversely affected by current Project operations, the No Action is unlikely to result in adverse effects to fish and aquatic resources.

PROPOSED ACTION

Based on the analysis discussed above, the results of the aquatics studies, and because the Proposed Action does not include changes to O&M activities, no adverse effects have been identified for Proposed Action.

6.5.2.4. Effects of Project Operations on Benthic Macroinvertebrate Communities, Indicators of Water Quality and Overall Aquatic Ecosystem Health

Project-regulated instream flows have the potential to directly affect the distribution, abundance, or structure of BMI communities. Indirect effects on these communities can also occur due to altered environmental conditions (e.g., water temperature, substrate size, suspended sediment). Existing information described in Section 6.5.1.7, *Benthic Macroinvertebrates*, indicates that BMI assemblages in Project-affected reaches of Lee Vining Creek downstream of Saddlebag Lake and Poole Powerhouse in 2000, 2005, 2006, and 2011 were of very good quality overall—similar to reference sites in nearby unimpaired stream reaches (e.g., Slate Creek) and indicative of likely intact conditions (CEDEN, 2020; SWRCB, 2020; Rost and Fritsen, 2014). Neither CSCI scores nor other metrics for characterization of BMI communities (e.g., density per m^2; Ephemeroptera, Plecoptera, and Trichoptera taxa density; percent shredder taxa) demonstrated a negative relationship between proximity to a Project facility and biological index values despite previous studies that have documented relatively low biological index values immediately downstream of large reservoirs (Rehn et al., 2007). Differences in BMI assemblages in 2006 at sites in Lee Vining Creek between Saddlebag Dam and Ellery Lake correlated primarily with differences in algal biomass; decreased proportions of burrower taxa and overall BMI density at Site LVSC were attributed to a substantial reduction in algal biomass below the confluence of Slate Creek, although no algae were observed in this reach during relicensing AQ-4 Study in 2023.

Data from relicensing studies (AQ-3 and AQ-4) and other studies in the watershed further indicate that Project operations are unlikely to adversely affect BMI communities in Project-affected reaches. Data collected from 2015 to 2017 in Lee Vining Creek downstream of Rhinedollar Dam and Glacier Creek downstream of Tioga Dam indicate BMI community structure (i.e., richness, evenness, density, and composition) is similar to other outlet streams of high-elevation reservoirs and natural lakes despite differences in flow and nutrient (e.g., ammonium) concentrations (Cohen, 2019). Additionally, self-sustaining fish populations composed of predominantly insectivorous species (i.e., trout) indicate BMIs in Project-affected reaches are sufficiently abundant to support fish condition (Section 6.5.1.7, *Benthic Macroinvertebrates*). Results of Study AQ-3 and Study AQ-6 suggest there are a variety of substrates in upper and lower Lee Vining Creek, including high proportions of cobbles and boulders, that can provide suitable habitat for diverse BMI communities.

NO ACTION

Under the No Action, SCE would continue to operate and maintain the Project in accordance with the terms and conditions of the existing FERC license. Because existing information indicates BMI assemblages in Project-affected reaches are not adversely affected by current Project operations, the No Action is unlikely to result in significant, adverse effects on BMI communities.

PROPOSED ACTION

Based on the analysis discussed above, the results of the aquatics studies, and because the Proposed Action does not include changes to O&M activities, no adverse effects have been identified for Proposed Action.

6.5.2.5. Consistency with Current Resource Management Objectives (Forest Plans, Basin Plan, etc.)

SCE has reviewed the desired conditions in the Inyo National Forest LMP (USFS, 2019) to assess if the Project is consistent with management objectives. The following desired conditions relating to fish and aquatic resources, with which the Project is consistent, include:

- SPEC-FW-DC 01: Sustainable populations of native and desirable nonnative plant and animal species are supported by healthy ecosystems, essential ecological processes, and land stewardship activities; and reflect the diversity, quantity, quality, and capability of natural habitats on the Inyo National Forest. These ecosystems are resilient to uncharacteristic fire, climate change, and other stressors, and this resilience supports the long-term sustainability of plant and animal communities.

- SPEC-FW-DC 05: The Inyo National Forest provides high-quality hunting and fishing opportunities. Habitat for nonnative fish and game species is managed in locations and ways that do not pose substantial risk to native species while still contributing to economies of local communities.

Results from AQ-2 Study suggest there are healthy, naturally reproducing populations of brook and brown trout within Project-affected stream reaches, which is consistent with the desired conditions described in the Inyo National Forest LMP (USFS, 2019). Additionally, continued stocking of Project-affected stream reaches will provide additional fishing opportunities within Lee Vining and Glacier Creeks. Furthermore, no native fish species were historically present within the Lee Vining Creek watershed, so no risk to native fish species is posed by the presence of nonnative fish species.

SCE has reviewed the desired conditions in the 2019 Basin Plan (LRWQCB, 2019) to assess if the Project is consistent with management objectives. The following desired conditions relating to invasive aquatic plant species, with which the Project is consistent, include:

- Biostimulatory Substances: The 2019 Basin Plan (LRWQCB, 2019) specifies waterbodies shall not contain biostimulatory substances in concentrations that promote aquatic growths to the extent that such growths cause nuisance or adversely affect the water for beneficial uses.

In AQ-1 Study, data suggest there are healthy, naturally reproducing populations of brown and brook trout within Project reservoirs, which is consistent with the desired conditions described in the Inyo National Forest LMP (USFS, 2019). Additionally, continued stocking of Project reservoirs by CDFW will provide additional fishing opportunities within Project reservoirs. Furthermore, no native fish species were historically present within Project reservoirs, so no risk to native fish species is posed by the presence of nonnative fish species.

6.5.2.6. Proposed Mitigation and Enhancement Measures

SCE intends to continue implementation of the existing MIFs and reservoir level requirements (PME-1 and PME-2, respectively). SCE will also continue to provide financial support for fish stocking in Ellery Lake as described in PME-3. Per PME-4, the proposed Resource Management Plan (Attachment 1 to Appendix E.1, *Protection, Mitigation, and Enhancement Measures*) includes continued implementation of the SCE *Invasive Mussel Prevention Plan* (SCE, 2017).

6.6. TERRESTRIAL WILDLIFE RESOURCES

This section describes general terrestrial wildlife resources in the vicinity of the Project. The discussion provided here is intended to inform an evaluation of potential issues relating to the Proposed Action and how the completed studies inform the understanding of Project effects. Terrestrial wildlife species listed under the federal ESA and the California ESA are discussed in detail in Section 6.9, *Rare, Threatened, and Endangered Species*. Aquatic wildlife and associated resources are discussed in Section 6.5, *Fish and Aquatic Resources*.

6.6.1. AFFECTED ENVIRONMENT

The area surrounding the FERC Project Boundary is within the Cascade-Sierra Mountains physiographic province, sculpted by glaciers and characterized by rounded granite outcrops, U-shaped valleys, glacial lakes within glacial till deposits, and talus slopes (FERC, 1992). Within Mono Basin, elevations range from over 13,000 feet amsl along the Sierra Nevada peaks to approximately 6,400 feet amsl at the shoreline of Mono Lake (Millar and Woolfenden, 1999), with the basin floor generally below 7,000 feet (Vorster, 1985).

Lee Vining Creek drains the eastern Sierra Nevada crest. Glacier Creek is a tributary to Lee Vining Creek that flows from Tioga Lake. Mount Dana (13,053 feet amsl), the highest peak in Mono Basin, and several other peaks above 12,000 feet amsl rim the watershed boundary (Jones & Stokes Associates, 1993). Lee Vining Creek drops precipitously down the eastern Sierra escarpment from Ellery Lake at 9,500 feet amsl to Poole Powerhouse at 7,825 feet amsl (Jones & Stokes Associates, 1993).

Precipitation amounts vary greatly in the Mono Lake watershed. The California Department of Water Resources gage at Ellery Lake (maintained by SCE) measures a historical average annual precipitation of 20.03 inches (CDEC, 2024). Since 2010, the average annual precipitation has been 18.5 inches. There are arctic-like winters in the high mountains and dry warm summer conditions in Mono Basin (LADWP, 1987). Average air temperature at Ellery Lake is 36 °F and 34 °F at Dana Meadows (CDEC, 2021).

Thirteen vegetation communities and other areas associated with the Project were identified in 2022 in the Botanical Resources Study (*TERR-1 General Botanical Resources Final Technical Report*, provided in Volume III of this DLA): alpine grasses and forbs, barren, developed, lakeshore, lodgepole pine, mixed conifer—fir, non-vegetated, quaking aspen, wet meadow, whitebark pine—alpine grasses and forbs, whitebark pine—lodgepole pine, water, and willow. Vegetation communities are further discussed in Section 6.7, *Botanical Resources*, and can be grouped into four categories: herbs, scrub, forest, and other. The four broad categories intergrade and mix with each other throughout the study area. Consequently, other than those wildlife species with very specific habitat requirements, most common wildlife species would be expected to occur within each of the four broad categories.

6.6.1.1. Definitions

SPECIAL-STATUS SPECIES

A special-status species is defined as a species considered by one or more branches of the federal government (e.g., U.S. Department of Agriculture, USFS, or Bureau of Land Management [BLM]) or by the state of California to merit regulatory consideration in association with prosecution of a Project. Special-status species is a catchall term that refers to any species given protection through federal, state, or local legislation. This would include designations of endangered, threatened, fully protected (California only), Species of Special Concern (SSC), Species of Conservation Concern (SCC), and other species formally designated as sensitive by relevant government agencies. As noted above, wildlife species listed under the federal ESA and the California ESA are discussed in detail in Section 6.9, *Rare, Threatened, and Endangered Species*, as are bald eagles (*Haliaeetus leucocephalus*) and golden eagles (*Aquila chrysaetos*), which are protected under the federal Bald and Golden Eagle Protection Act (BGEPA). Other designations considered special-status are described below.

SPECIES OF CONSERVATION CONCERN

SCC is a rank assigned by the Inyo National Forest. Under the 2012 Planning Rule (36 CFR § 219.7(c)(3)), the Regional Forester determined the terrestrial wildlife, aquatic wildlife, and plant species that meet the criteria for SCC for the Inyo National Forest's LMP. The definition of SCC is found at 36 CFR § 219.9(c), and criteria for identifying them are outlined in the Forest Service Handbook 1909.12 Chapter 10, Section 12.52c. An SCC is a species, other than federally recognized threatened, endangered, proposed, or candidate species, that is known to occur in the plan area and for which the Regional Forester has determined that the best available scientific information indicates substantial concern about the species' capability to persist over the long-term in the plan area (36 CFR § 219.9) (USFS, 2019).

SPECIES OF SPECIAL CONCERN

An SSC is a species, subspecies, or distinct population of an animal native to California that currently satisfies one or more of the following (not necessarily mutually exclusive) criteria:

1. Is extirpated from the state or, in the case of birds, is extirpated in its primary season or breeding role.

2. Is listed as federally, but not state-, threatened or endangered; meets the state definition of threatened or endangered but has not formally been listed.

3. Is experiencing, or formerly experienced, serious (noncyclical) population declines or range retractions (not reversed) that, if continued or resumed, could qualify it for state threatened or endangered status.

4. Has naturally small populations exhibiting high susceptibility to risk from any factor(s), that if realized, could lead to declines that would qualify it for state threatened or endangered status.

BIRDS OF CONSERVATION CONCERN

The 1988 amendment to the Fish and Wildlife Conservation Act (16 USC §§ 2901–2911), mandates the USFWS to "identify species, subspecies, and populations of all migratory nongame birds that, without additional conservation actions, are likely to become candidates for listing under the Endangered Species Act of 1973." The overall goal of the Birds of Conservation Concern is to accurately identify the migratory and non-migratory bird species (beyond those already designated as federally threatened or endangered) that represent our highest conservation priorities. Bird species considered for inclusion as a Bird of Conservation Concern include nongame birds, gamebirds without hunting seasons, subsistence-hunted nongame birds in Alaska, federal ESA candidates, proposed endangered or threatened, and recently delisted species (USFWS, 2021).

6.6.1.2. Terrestrial Wildlife Resources Surveys

Wildlife surveys were conducted in 2021, 2022, and 2023 at the following locations, including a 200-foot buffer (Figure 6.6-1):

- Saddlebag Dam and associated infrastructure
- Tioga Dam and SCE access road to Tioga Dam
- Rhinedollar Dam
- Poole Powerhouse and associated facilities, including garages, storage buildings, and tail race

Willow Flycatcher (*Empidonax traillii*) habitat assessment surveys were conducted in the area below Poole Powerhouse down to the reservoir at the LADWP Diversion Dam.

Trail cameras were installed at three locations within the study area:

- Approximately 300 feet east of Tioga Lake at the top of a wet meadow near the northeastern shore; camera installed June through August 2022 and July through September 2023.
- Along the western side of the Lee Vining Creek floodplain approximately 8,000 feet downstream of Saddlebag Lake; camera installed July through September 2023.
- Within the meadow area connecting Greenstone Lake and Saddlebag Lake; camera installed July through September 2023.

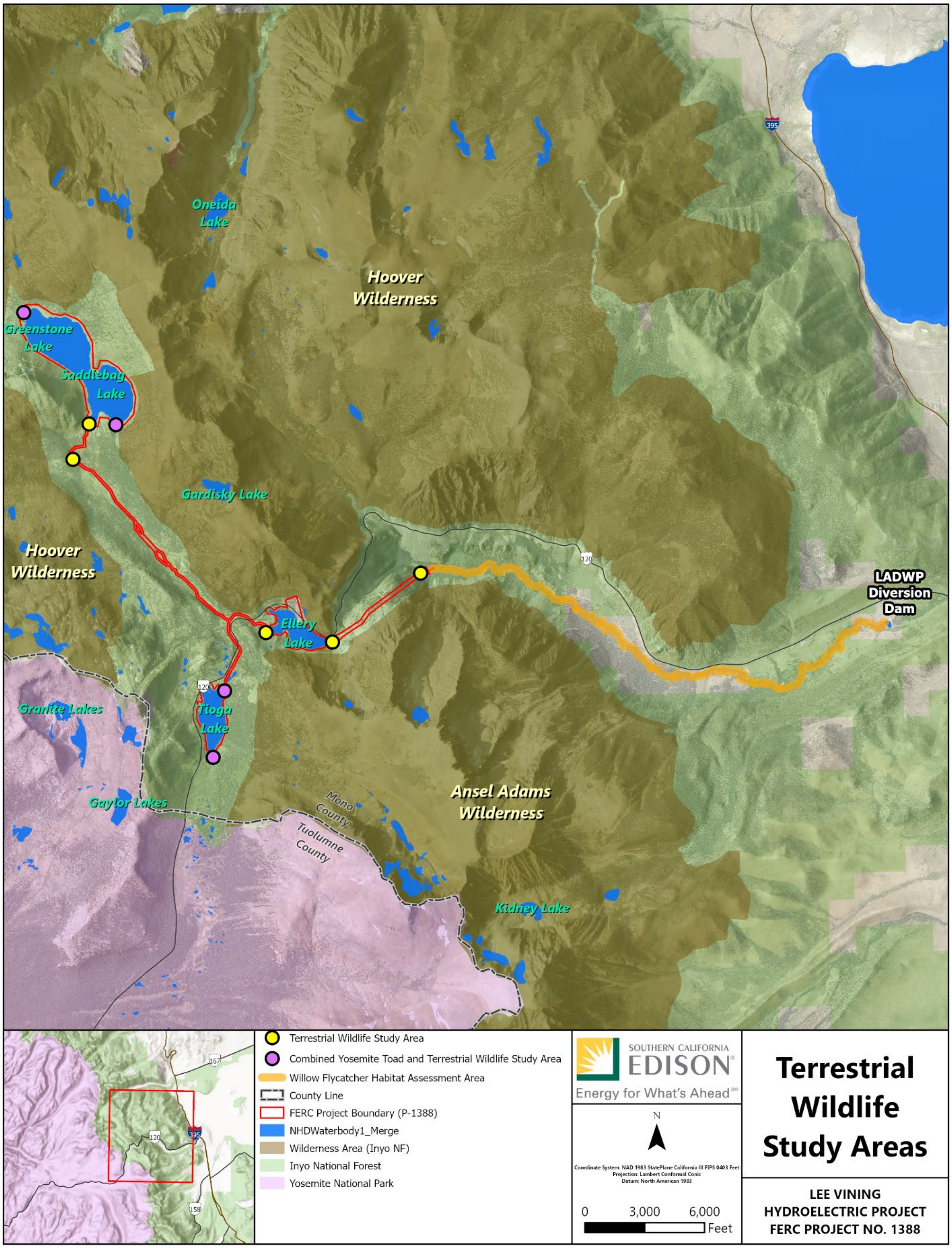


Figure 6.6-1. Terrestrial Wildlife Study Areas.

As a result of surveys for terrestrial wildlife, a total of 68 terrestrial wildlife species were observed including one federally endangered species (Yosemite toad [*Anaxyrus canorus*]), one species listed as federally and state-endangered and fully state-protected (Sierra Nevada bighorn sheep [*Ovis canadensis sierrae*]), one state-listed endangered species (bald eagle), two fully state-protected species (bald eagle and golden eagle), and three SSCs (olive-sided flycatcher [*Contopus cooperi*], American snowshoe hare [*Lepus americanus tahoensis*], and white-tailed jack rabbit [*Lepus townsendii townsendii]*). Surveys resulted in observing five USFWS bird SCCs (including bald eagle, golden eagle, olive-sided flycatcher, Cassin's finch [*Haemorhous cassinii*], and green-tailed towhee [*Pipilo chlorurus*]) and three Inyo National Forest SCCs (including Yosemite toad, bald eagle, and Sierra Nevada bighorn sheep).

The survey resulted in the observation of many common eastern Sierra Nevada wildlife species, including Sierran tree frog (*Pseudacris sierrae*), mountain garter snake (*Thamnophis elegans elegans*), red-tailed hawk (*Buteo jamaicensis*), northern flicker (*Colaptes auratus*), Clark's nutcracker (*Nucifraga columbiana*), mountain chickadee (*Poecile gambeli*), pine siskin (*Spinus pinus*), fox sparrow (*Passerella iliaca*), Wilson's warbler (*Cardellina pusilla*), Douglas' squirrel (*Tamiasciurus douglasii*), yellow-bellied marmot (*Marmota flaviventris*), Belding's ground squirrel (*Urocitellus beldingi*), alpine chipmunk (*Neotamias alpinus*), North American pika (*Ochotona princeps*), coyote (*Canis latrans*), mountain lion (*Puma concolor*), mule deer (*Odocoileus hemionus*), Brazilian free-tailed bat (*Tadarida brasiliensis*), western red bat (*Lasiurus frantzii*), hoary bat (*Aeorestes cinereus*), silver-haired bat (*Lasionycteris noctivagans*), long-eared myotis (*Myotis evotis*), and Yuma myotis (*Myotis yumanensis*).

Table 4.1-1 in the TERR-2 Final Technical Report in Volume III of this DLA lists all the wildlife species observed or otherwise documented during the 2022 and 2023 surveys.

6.6.1.3. Trail Camera Surveys

Only large mammals were successfully captured on the trail cameras, specifically mountain lion (*Puma concolor*), coyote (*Canis latrans*), black bear (*Ursus americanus*), and mule deer (*Odocoileus hemionus*). The camera at Tioga Lake captured all the above species. The camera along Lee Vining Creek captured coyote and mule deer, while the camera at the northwestern end of Saddlebag Lake captured only coyote. Representative photographs collected by the trail cameras are included in Attachment A of the TERR-2 Final Technical Report, provided in Volume III of this DLA.

6.6.1.4. Bat Occupancy

Following a detailed visual inspection of the Project facilities, including the buildings at Poole Powerhouse, no evidence of bat roosting was observed in any of the Project facilities and none of the facilities are expected to support any static colonies of roosting bats. The ultrasonic acoustic recording unit deployed at the Saddlebag Dam recorded foraging of three bat species: Mexican free-tailed bat (*Tadarida brasiliensis*), long-eared bat (*Myotis evotis*), and little brown bat (*Myotis lucifugus*). The ultrasonic acoustic recording unit deployed below the Poole Powerhouse tailrace recorded foraging of nine bat species: Mexican free-tailed bat, long-eared bat, little brown bat, western red bat, hoary bat, silver-haired bat, small-footed bat (*Myotis ciliolabrum*), long-legged bat (*Myotis volans*), and Yuma bat (*Myotis yumanensis*).

6.6.1.5. Willow Flycatcher Habitat Assessment

A Willow Flycatcher Habitat Assessment was conducted below the FERC Project Boundary in the reach of Lee Vining Creek between Poole Powerhouse and the reservoir at the LADWP Diversion Dam, which is approximately 5 miles long (Figure 6.6-1). Here, Lee Vining Creek varies from some reaches that are narrow, incised, and fast moving to reaches of slow-moving waters with small pools to reaches with broad meadows.

Willow vegetation is generally present; however, it is only dominant between the Aspen Campground and the Lower Lee Vining Campground, a reach of approximately 2 miles. Between the Aspen Campground and the Lower Lee Vining Campground, willow vegetation occurs as a low to mid-range canopy with height range from 6 to 20 feet. The dominant willow species found along this reach is narrowleaf willow (*Salix exigua*). Other riparian tree species that occur in the same mid-range vegetative structure include cottonwood (*Populus* spp.) and alder (*Alnus* spp.). A sparse overstory of conifers including Jeffrey pine (*Pinus jeffreyi*), lodgepole pine (*Pinus contorta*), and singleleaf pinyon (*Pinus monophylla*) are present with a dense understory of various shrub species including Wood's rose (*Rosa woodsii*), currant (*Ribes* sp.), and snowberry (*Symphoricarpos* sp.). In the adjacent meadows and dry washes, Scouler's willow (*Salix scouleriana*) is the dominant species. Great Basin mixed scrub and conifer forest borders the riparian vegetation.

West (upstream) of the Aspen Campground and east (downstream) of Lower Lee Vining Creek Campground, the vegetation along Lee Vining Creek is dominated by a dense overstory of upland montane conifers with willow and other riparian trees occurring in the understory with a substantially decreased density.

The closest recorded willow flycatcher nest site (not identified to subspecies) is approximately 4 miles south of the Project in the Pumice Valley of the Mono Basin region (McCreedy, 2007; CDFW, 2022). Observations of willow flycatcher (not identified to subspecies) occur along Lee Vining Creek in the Willow Flycatcher Study Area, but there are no records of nesting (CDFW, 2022; eBird, 2022).

The reach of Lee Vining Creek between the Aspen Campground and the Lower Lee Vining Campground supports potentially suitable nesting habitat for willow flycatcher. This reach contains perennial aboveground water with a mosaic of open areas (including riparian floodplains, meadows, or dry washes) among extensive stands of shrubby willow thickets over 5 feet tall, greater than 0.5 acre in size, and without substantial canopy cover of pine trees.

The reach of Lee Vining Creek west (upstream) from the Aspen Campground has sparse understory vegetation and high canopy cover (over 75 percent cover) from the conifers in the overstory. Although there are willow, cottonwood, and alder trees with a sparse understory of Wood's rose within this reach, the dense overstory canopy of conifer trees makes these portions of Lee Vining Creek not suitable breeding habitat for willow flycatcher.

6.6.2. Potential Adverse Effects and Issues

No potential adverse effects on terrestrial wildlife were identified as part of this relicensing, though some potential issues were analyzed as described below.

6.6.2.1. Effects of Project Operations and Maintenance on Terrestrial Wildlife Resources

Terrestrial wildlife habitat in the Project Area is widespread and generally consists of the upland vegetation types within and surrounding the FERC Project Boundary. Maintenance of Project facilities within the FERC Project Boundary occurs on previously disturbed land, roads, or within previously disturbed and maintained areas, such as the areas surrounding valve houses and gaging stations.

No Action

Under the No Action, SCE would continue to operate and maintain the Project in accordance with the terms and conditions of the existing license. No adverse effects on terrestrial wildlife habitat and associated wildlife resources from the continued Project O&M were identified relative to baseline conditions and are therefore not anticipated under the No Action.

Proposed Action

Based on the analysis discussed in this exhibit, the results of the wildlife Study TERR-2, and because the Proposed Action does not include operational changes beyond what is discussed above, SCE identified no potential adverse effects of continued O&M on terrestrial wildlife habitat and associated wildlife.

The adjustment of the existing FERC Project Boundary under the Proposed Action is limited to areas currently being used for O&M activities but not previously included in the boundary. No adverse effects are anticipated as a result of the Proposed Action, as all of the newly incorporated areas have been subject to ongoing disturbance.

Maintenance activities are anticipated to be located in developed areas or areas that are disturbed and routinely maintained and would have minimal to no effects on terrestrial wildlife resources.

Under the new license, continued Project operations are not anticipated to affect terrestrial wildlife resources.

6.6.2.2. Effects of Dispersed-Use Recreational Activities on Terrestrial Wildlife Resources

Neither the existing Project nor the Proposed Action involve any recreational elements, but some of the Project facilities are used as resources for recreating (i.e., fishing within Project reservoirs). Additionally, the Project occurs within a recreational corridor between a major state highway and nationally designated wilderness areas and is located adjacent to Yosemite National Park. Recreation management is not part of SCE's routine O&M and, as such, SCE has no control over public recreation use of the Project Area outside of safety requirements. Dispersed-use recreational activities (i.e., activities not contained to one area specifically developed for the activity) within the FERC Project Boundary include hiking, fishing, and mountain biking. These activities most commonly coincide with the edge of waterlines (i.e., along the shorelines of Tioga and Saddlebag Lakes). Trampling of small, slow-moving wildlife (such as Sierran tree frog juveniles) and associated habitat may occur as a result of these activities.

NO ACTION

Under the No Action, SCE would continue to operate and maintain the Project in accordance with the terms and conditions of the existing FERC Project license. Potential effects associated with recreational activities in the Project Area would not change, relative to baseline conditions. Subsequently, current dispersed-use recreational activity will continue to have potential to affect common, slow-moving wildlife, such as Sierran tree frog and their associated habitat, although this is not considered a Project effect, as it is outside the control of SCE Project operations.

PROPOSED ACTION

No new O&M activities are included under the Proposed Action, and no elements of the Proposed Action are anticipated to affect dispersed-use recreation activities. Subsequently, while dispersed-use recreation would likely continue under the Proposed Action, this is outside the control of SCE Project operations and is not considered a Project effect.

6.6.2.3. Effects of Project Operations and Maintenance on Migratory Birds and Raptors

The primary transmission line runs from the switchyard to Poole Powerhouse; the remaining length of transmission line was removed from the Project's license in 2001 (Exhibit A of this License Application) but continues from the switchyard to the Lee Vining substation. No deaths of migratory birds or raptors have been reported in the FERC Project Boundary due to powerline encounters.

SCE protects avian resources through implementation of the Avian Protection Plan and the Nesting Bird Management Guidelines for Small Projects. SCE implements the procedures described in those documents as needed for each project and for routine O&M. Avian mortality related to SCE facilities would be discovered when SCE patrols its transmission lines and substations for cause of a relay or outage on a line. Other mortality discoveries would be made while performing inspections of facilities or while environmental surveys are occurring. Coordination with SCE's Corporate Avian Compliance Manager revealed that there have been no reported instances of avian mortality within the FERC Project Boundary. SCE reports fatalities on an annual basis with records logged into an excel data base. A report per-se is not generated. SCE has no records of eagles or other sensitive avian species being impacted by any Project facilities.

NO ACTION

Under the No Action, SCE would continue to operate and maintain the Project in accordance with the terms and conditions of the existing FERC Project license. No adverse effects on migratory birds and raptors from O&M of the Project have been identified.

PROPOSED ACTION

No changes in Project operations are proposed as part of the Proposed Action; therefore, no adverse effects on migratory birds or raptors are anticipated from continued operations.

The adjustment of the existing FERC Project Boundary under the Proposed Action is limited to areas currently being used for O&M activities but not previously included in the boundary. No adverse effects are anticipated as a result of the Proposed Action, as all of the newly incorporated areas have been subject to ongoing disturbance. Findings of the wildlife Study TERR-2 indicate no adverse effects on migratory birds or raptors due to the presence of Project facilities or non-Project power transmission lines in the Project Area.

Maintenance activities continue to be located in developed areas or areas that are disturbed and routinely maintained and would continue to have minimal to no adverse effects on migratory birds and raptors.

6.6.2.4. Consistency with Current Resource Management Objectives (Forest Plans, Basin Plan, etc.)

Chapter 2 of the Inyo National Forest's LMP (USFS, 2019) describes forest-wide conditions and management direction for wildlife resources. This direction applies across all lands of the Inyo, including desired conditions, objectives, goals, standards, guidelines, and potential management approaches. Using the results obtained from Project technical reports, SCE assessed wildlife resources and their habitat, against the desired future conditions stated in Chapter 2.

The Proposed Action is consistent with the below-listed desired conditions because the Project facilities are sited at locations that are currently disturbed or developed or in areas that are maintained on a consistent routine basis. Desired conditions for wildlife resources include:

- SPEC-FW-DC 01: Sustainable populations of native and desirable non-native plant and animal species are supported by healthy ecosystems, essential ecological processes, and land stewardship activities, and reflect the diversity, quantity, quality, and capability of natural habitats in the Inyo National Forest. These ecosystems are resilient to uncharacteristic fire, climate change, and other stressors, and this resilience supports the long-term sustainability of plant and animal communities.

- SPEC-FW-DC 02: Habitats for at-risk species support self-sustaining populations within the inherent capabilities of the plan area. Ecological conditions provide habitat conditions that contribute to the survival, recovery, and delisting of species under the Endangered Species Act; preclude the need for listing new species; improve conditions for SCCs including addressing threats (e.g., minimal effects from disease); and sustain both common and uncommon native species.

- SPEC-FW-DC 05: The Inyo National Forest provides high quality hunting and fishing opportunities. Habitat for non-native fish and game species is managed in locations and ways that do not pose substantial risk to native species, while still contributing to economies of local communities.

- SPEC-FW-DC 06: Residents and visitors have ample opportunities to experience, appreciate, and learn about the Inyo National Forest's wildlife, fish, and plant resources.

- TERR-FW-DC 01: Each vegetation type contains a mosaic of vegetation conditions, densities and structures. This mosaic, which occurs at a variety of scales across landscapes and watersheds, reflects conditions that provide for ecosystem integrity and ecosystem diversity given the inherent capabilities of the landscape that is shaped by site conditions and disturbance regimes.

- TERR-FW-DC 06: The landscape contains a mosaic of vegetation types and structures that provide habitat, movement and connectivity for a variety of species including wide-ranging generalists such as bear, mountain lion, and deer; more localized, semi-specialists such as ground-nesting, shrub-nesting, and cavity-nesting birds and various bats; and specialists such as old forest and sagebrush-associated species.

- WTR-FW-DC 04: Soil and vegetation functions in upland and riparian areas are sustained and resilient. Healthy soils provide the base for resilient landscapes and nutritive forage for browsing and grazing animals, and support timber production. Healthy upland and riparian areas support healthy fish and wildlife populations, enhance recreation opportunities, and maintain water quality.

The Project as described under the Proposed Action proposes minor changes to the FERC Project Boundary but no changes in O&M. Therefore, the Project would not affect the current terrestrial habitat (soils, vegetation, or movement and connectivity for wildlife), nor affect current habitats that support at-risk species or species protected under the federal ESA and Migratory Bird Treaty Act. The Project, as described under the Proposed Action, would not have an effect on visitor's ability to appreciate the Project Area.

6.6.2.5. Proposed Protection, Mitigation, and Enhancement Measures

As no effects are anticipated, SCE is not proposing specific wildlife mitigation measures; however, guidance language to protect wildlife resources and manage the potential introduction and spread of invasive species will be included in the Resource Management Plan (PME-4) in Appendix E.1, *Protection, Mitigation, and Enhancement Measures*.

6.7 Botanical Resources

This section describes general botanical resources in the vicinity of the Project. The discussion provided here is intended to inform an evaluation of potential issues relating to the Proposed Action and how the completed studies inform the understanding of Project effects.

Terrestrial botanical resources include vegetation communities, special-status plants, and common plants, and non-native invasive plant (NNIP) species found in the vicinity of the Project. Special-status plant species listed under the federal and state ESAs are discussed in detail in Section 6.9, *Rare, Threatened, and Endangered Species*. Aquatic botanical, wildlife, and associated resources are discussed in Section 6.5, *Fish and Aquatic Resources*.

6.7.1. Affected Environment

The General Botanical Resources Survey (TERR-1) was conducted in 2022 and 2023. During the TWG meetings, SCE and Stakeholders identified the need to conduct a botanical resources study to determine the presence of sensitive natural communities, special-status plant species, NNIP species, and riparian habitat at Project facilities and USFS recreational areas. The TERR-1 Final Technical Report is included in Volume III of this DLA.

Information on vegetation communities and plant species, including riparian conditions monitored as part of the current license, is provided by the previously conducted field surveys and license-required monitoring studies (Psomas, 2006, 2010, 2013; Read, 2012, 2017, 2022) and the Project EA (FERC, 1992). Since those studies were undertaken, new species have been added to the federal and state endangered species lists, and others have been deemed sensitive by various government agencies.

The Project Area generally occurs between 7,800 and 10,200 amsl on the eastern side of the Sierra Nevada. Three study areas were surveyed as part of TERR-1 within the Project Area:

- The Botanical Resources Study Area (Figure 6.7-1) includes all aboveground Project facilities and USFS recreation areas, with a 100-foot buffer around these areas. Survey areas were adjusted in the field based on accessibility and topography (Appendix A, *Mapbooks*, in the TERR-1 Final Technical Report in Volume III of this DLA).

- The Riparian Monitoring Study Area was developed as part of the vegetation monitoring conducted for the current FERC license, beginning in 1999. The area includes three sites along Lee Vining Creek between Saddlebag Lake and the confluence with Slate Creek (Appendix A, *Mapbooks*, in the TERR-1 Final Technical Report in Volume III of this DLA). This study is discussed further in Section 6.8, *Wetland, Riparian, and Littoral Resources*.

- The Normalized Difference Vegetation Index (NDVI) Study Area extends from above Saddlebag Lake to below Aspen Campground and includes eight study sites. Five "test" study reaches along Lee Vining Creek downstream of Project facilities, and three outside of the Project to act as controls (Appendix A, *Mapbooks*, in the TERR-1 Final Technical Report in Volume III of this DLA). This study is discussed further in Section 6.8, *Wetland, Riparian, and Littoral Resources*.

Figure 6.7-1. Botanical Resources Study Area Overview.

6.7.1.1. Definitions

For the purposes of this document, sensitive natural communities are documented by the CDFW's California Natural Communities List (CDFW, 2023). This document provides a list of vegetation alliances, associations, and special stands and their rarity ranking.

For the purposes of this document, a special-status plant is defined as a plant species considered by the USFS (Inyo National Forest) or by the State of California to merit regulatory consideration in association with prosecution of a project.

NNIP species are not native to a given area and, once introduced, will establish, reproduce, and spread (Cal-IPC, 2024). For the purposes of this document, NNIP species are identified by the Inyo National Forest Invasive Plant Inventory Database (NRM–TESP/IS, 2018) and the California Invasive Plant Council (Cal-IPC).

SENSITIVE NATURAL COMMUNITY

Natural communities are evaluated using NatureServe's Heritage Methodology for rarity and threat parameters. For rarity the ranking involves the knowledge of range and distribution of a given type of vegetation and the proportion of occurrences that are of good ecological integrity. Threats and trends are considered in categories such as residential and commercial development, agriculture, energy production and mining, and invasive and other problematic species and genes (among others). Ranks range from S1 (very rare and threatened) to S5 (demonstrably secure) and are done at both the global and state levels. Natural communities with ranks of S1 to S3 are considered sensitive natural communities to be addressed in the environmental review processes of the California Environmental Quality Act (CEQA) and its equivalents.

CALIFORNIA RARE PLANT RANK

The California Rare Plant Rank (CRPR) is a ranking system by the Rare Plant Status Review group, which consists of over 300 botanical experts from the government, academia, NGOs, and the private sector, and is managed by the California Native Plant Society and the CDFW. The CEQA requires consideration of plant species with the following CRPR rankings:

- 1A—presumed extirpated in California and either rare or extinct elsewhere
- 1B—rare or endangered in California and elsewhere
- 2A—presumed extirpated in California, but more common elsewhere
- 2B—rare or endangered in California, but common elsewhere

Species with a CRPR of 3 are part of a review list, which requires more information; species with a CRPR of 4 are part of a watch list, which are of limited distribution. Consideration of these species is not typically required by the CEQA.

The CRPR also employs a Threat Rank extension that further clarifies the level of endangerment of a plant species. An extension of .1 is assigned to plants that are considered to be "seriously threatened" in California (i.e., over 80 percent of occurrences are threatened or have a high degree and immediacy of threat). Extension .2 indicates the plant is "moderately threatened" in California (i.e., between 20 and 80 percent of the occurrences are threatened or have a moderate degree and immediacy of threat). Extension .3 is assigned to plants that are considered "not very threatened" in California (i.e., less than 20 percent of occurrences are threatened or have a low degree and immediacy of threat or no current threats are known). The absence of a threat code extension indicates that this information is lacking for the plant(s) in question.

UNITED STATES FOREST SERVICE SPECIES OF CONSERVATION CONCERN

SCC is a rank assigned by the Inyo National Forest. Under the 2012 Planning Rule (36 CFR 219.7(c)(3)), the Regional Forester determined the terrestrial wildlife, aquatic wildlife, and plant species that meet the criteria for SCC for the Inyo National Forest's LMP. The definition of SCC is found at 36 CFR 219.9(c), and criteria for identifying them are outlined in the Forest Service Handbook 1909.12 Chapter 10, Section 12.52c. An SCC is a species, other than federally recognized threatened, endangered, proposed, or candidate species, that is known to occur in the plan area and for which the Regional Forester has determined that the best available scientific information indicates substantial concern about the species' capability to persist over the long-term in the plan area (36 CFR 219.9) (USFS, 2019).

NON-NATIVE INVASIVE PLANTS

Cal-IPC defines NNIP species as plants that (1) are not native to, yet can spread into, wildland ecosystems, and that (2) displace native species, hybridize with native species, alter biological communities, or alter ecosystem processes (Cal-IPC, 2024). They may also cause harm to the environment, economy, or human health.

Cal-IPC categorizes plants as High, Moderate, or Limited, according to the degree of ecological effect in California (Cal-IPC, 2024):

- High: Severe ecological effects on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal and establishment. Most are widely distributed ecologically.

- Moderate: Substantial and apparent—but generally not severe—ecological effects on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal, though establishment is generally dependent upon ecological disturbance. Ecological amplitude and distribution may range from limited to widespread.

- Limited: Invasive but ecological effects are minor on a statewide level (or there is not enough information to justify a higher score). Their reproductive biology and other attributes result in low to moderate rates of invasiveness. Ecological amplitude and distribution are generally limited, but these species may be locally persistent and problematic.

The USFS has categorized NNIP species into various treatment strategies: (1) eradicate, (2) control, (3) contain, and (4) limited or no treatment.

6.7.1.2. Vegetation Mapping Results

Thirteen vegetation communities and other areas were identified in the Botanical Resources Study Area: alpine grasses and forbs, barren, developed, lakeshore, lodgepole pine, mixed conifer—fir, non-vegetated, quaking aspen, wet meadow, whitebark pine—alpine grasses and forbs, whitebark pine—lodgepole pine, water, and willow.

Alpine Grasses and Forbs

The alpine grasses and forbs vegetation community occurs in the following portions of the Botanical Resources Study Area: Saddlebag Dam and Campgrounds, Junction Campground, Ellery Lake Overlook, Rhinedollar Dam and Penstock Trail, Tioga Lake Campground, and Tioga Dam. This vegetation community consists of a variety of native and non-native annual and perennial grasses and forbs, with few scattered shrubs or trees. The habitat is drier than the wet meadow vegetation type, described below. Species composition varies by site, but includes rough bent grass (*Agrostis scabra*), reflexed rockcress (*Boechera retrofracta*), abrupt-beaked sedge (*Carex abrupta*), sagebrush sedge (*Carex filifolia* var. *erostrata*), squirreltail wildrye (*Elymus elymoides* var. *elymoides*), reduced buckwheat (*Eriogonum nudum* var. *deductum*), pale fragrant monardella (*Monardella odoratissima* ssp. *pallida*), Sierra beardtongue (*Penstemon heterodoxus* var. *heterodoxus*), Newberry's beardtongue (*Penstemon newberryi*), compact spear phacelia (*Phacelia hastata* var. *compacta*), Parry's rush (*Juncus parryi*), and one-seeded pussypaws (*Calyptridium monospermum*).

This vegetation type does not correspond to a single vegetation community recognized by the CDFW (2023). Vegetation alliances or associations dominated by particular species may be considered a sensitive natural community (e.g., the *Carex filifolia* association) while others are not (e.g., the *Elymus elymoides* provisional association).

Barren

Barren areas occur in the following portions of the Botanical Resources Study Area: Rhinedollar Dam and Penstock Trail and Tioga Dam. This landcover consists of exposed bedrock, cliffs, and scree slopes with limited vegetation. Areas with soil development are mapped as non-vegetated.

Given the lack of vegetation, this area would not be considered a sensitive natural community.

DEVELOPED

Developed areas occur in the following portions of the Botanical Resources Study Area: Saddlebag Dam and Campgrounds, Sawmill Campground, Junction Campground, Ellery Lake Campground, Ellery Lake Overlook, Rhinedollar Dam and Penstock Trail, Poole Powerhouse, Tioga Lake Campground, and Tioga Dam. Developed areas are unvegetated and consist of buildings, paved roads, and parking lots.

Given the lack of vegetation, this area would not be considered a sensitive natural community.

LAKESHORE

Lakeshore occurs in the following portion of the Botanical Resources Study Area: Saddlebag Dam and Campgrounds. The area around the reservoir has a fluctuating shoreline that is dependent on climatic conditions (e.g., rainfall, snowpack) and water releases. During the 2022 survey, water levels were low and much of the lakeshore was exposed. This area contained scattered vegetation such as mountain bent grass (*Agrostis humilis*), rough bent grass, arctic pearlwort (*Sagina saginoides*), and abrupt-beaked sedge. During the 2023 survey, water levels were much higher and much of the lakeshore was submerged. The vegetation types shown in Appendix A, *Mapbooks*, in the TERR-1 Final Technical Report, presented in Volume III of this DLA, represent 2022 conditions.

There is no vegetation alliance or association dominated by mountain bent grass, rough bent grass, or abrupt-beaked sedge recognized by the CDFW. However, since mountain bent grass is a special-status plant species (see Section 6.7.1.3, *Special-Status Plant Species*), this area may be considered a sensitive natural community. However, the area is inundated when reservoir levels are normal.

LODGEPOLE PINE

The lodgepole pine vegetation community occurs in the following portions of the Botanical Resources Study Area: Sawmill Campground and Junction Campground. This vegetation type is dominated by a canopy of lodgepole pine (*Pinus contorta* ssp. *murrayana*). The understory varies but contains species such as sagebrush sedge, fireweed (*Chamerion angustifolium* ssp. *circumvagum*), western prickly gooseberry (*Ribes montigenum*), northern goldenrod (*Solidago multiradiata*), and Fendler's meadow-rue (*Thalictrum fendleri*).

The *Pinus contorta* ssp. *murrayana* association is not considered a sensitive natural community by the CDFW (2023).

MIXED CONIFER—FIR

The mixed conifer—fir vegetation community occurs in the following portion of the Botanical Resources Study Area: Poole Powerhouse. This vegetation type is dominated by a canopy of Jeffrey pine (*Pinus jeffreyi*) and white fir (*Abies concolor*). The understory contains species such as mugwort (*Artemisia douglasiana*), silver wormwood (*Artemisia* *ludoviciana*), big sagebrush (*Artemisia tridentata*), bush chinquapin (*Chrysolepis sempervirens*), and roundleaf snowberry (*Symphoricarpos rotundifolius*).

The *Pinus jeffreyi—Abies concolor* association is not considered a sensitive natural community by the CDFW (2023).

NON-VEGETATED

Non-vegetated areas occur in the following portion of the Botanical Resources Study Area: Saddlebag Dam and Campgrounds. This landcover lacks vegetation or has sparse vegetation. It consists of the exposed slope on the back of Saddlebag Dam as well as larger dirt roads and graded areas. Small dirt trails found in other areas were not mapped separately from the surrounding vegetation type.

Given the lack of vegetation, this area would not be considered a sensitive natural community.

QUAKING ASPEN

The quaking aspen vegetation community occurs in the following portion of the Botanical Resources Study Area: Poole Powerhouse. This vegetation type is dominated by a canopy of quaking aspen (*Populus tremuloides*) with lesser amount of gray-leafed Sierra willow (*Salix orestera*) and bitter cherry (*Prunus emarginata*).

The *Populus tremuloides* association is considered a sensitive natural community by the CDFW (2023).

WET MEADOW

The wet meadow vegetation community occurs in the following portions of the Botanical Resources Study Area: Saddlebag Dam and Campgrounds, Sawmill Campground, and Tioga Dam. This vegetation type is dominated by a variety of sedges and rushes such as abrupt-beaked sedge, Baltic rush (*Juncus balticus* ssp. *ater*), Parry's rush, and Sierra woodrush (*Luzula orestera*). Other species include primrose monkeyflower (*Erythranthe primuloides*), Sierra gentian (*Gentianopsis holopetala*), ranger's button (*Angelica capitellata*), small alisma-leaved buttercup (*Ranunculus alismifolius* var. *alismellus*), alpine shooting star (*Primula tetrandra*), and Pacific onion (*Allium validum*). The habitat is wetter than the alpine grasses and forbs vegetation type, described above.

This vegetation type does not correspond to a single vegetation community recognized by the CDFW (2023). Vegetation alliances or associations dominated by particular species may be considered a sensitive natural community (e.g., the *Carex filifolia* association) but most of the species found in the wet meadows are not named as a specific alliance or association.

WHITEBARK PINE—ALPINE GRASSES AND FORBS

The whitebark pine—alpine grasses and forbs vegetation community occurs in the following portions of the Botanical Resources Study Area: Saddlebag Dam and Campgrounds, Ellery Lake Campground, and Rhinedollar Dam and Penstock Trail. This vegetation type is characterized by the presence of whitebark pine (*Pinus albicaulis*). A relatively small amount of lodgepole pine is also present. The understory contains species typical of the alpine grasses and forbs (but in lower densities) and the lodgepole pine vegetation types.

Only certain associations of the *Pinus albicaulis* Alliance are considered sensitive natural communities by the CDFW (2023). However, given that the species has been federally listed as a threatened species under the ESA, this vegetation type could be considered sensitive.

WHITEBARK PINE—LODGEPOLE PINE

The whitebark pine—lodgepole pine vegetation community occurs in the following portions of the Botanical Resources Study Area: Sawmill Campground, Tioga Lake Campground, and Tioga Dam. This vegetation type contains a mix of whitebark pine and lodgepole pine. The understory contains species typical of the alpine grasses and forbs and the lodgepole pine vegetation types.

There is no named association containing whitebark pine and lodgepole pine in the CDFW's list sensitive natural communities (CDFW, 2023). However, as discussed above, areas containing whitebark pine could be considered sensitive.

WATER

The water vegetation community was observed at one location within the Botanical Resources Study Area: a small pond located northeast of the Tioga Auxiliary Dam. This landcover is unvegetated.

Given the lack of vegetation, this area would not be considered a sensitive natural community.

WILLOW

The willow vegetation community occurs in the following portions of the Botanical Resources Study Area: Saddlebag Dam and Campgrounds, Junction Campground, Ellery Lake Campground, Rhinedollar Dam and Penstock Trail, Poole Powerhouse, and Tioga Dam. The willow vegetation type is dominated by various shrubby willow species, depending on location. The willow density is generally high with few understory species. Common species include Sierra willow (*Salix eastwoodiae*), Jepson's willow (*Salix jepsonii*), and gray-leafed willow (*Salix orestera*). Co-occurring species may include fireweed, American dogwood (*Cornus sericea*) (only at Poole Powerhouse), shrubby cinquefoil (*Dasiphora fruticosa*), Wood's rose (*Rosa woodsia*), Pacific onion, small alisma-leaved buttercup, and willowherb (*Epilobium* spp.).

Various willow associations are considered to be sensitive natural communities, including the *Salix eastwoodiae* association and the *Salix jepsonii* association (CDFW, 2023). Areas dominated by these two species would be considered sensitive natural communities while areas dominated by narrow-leaved willow and gray-leafed willow would not be considered sensitive.

6.7.1.3. Special-Status Plant Species

One special-status plant species tracked by the California Natural Diversity Database was observed in 2022 and 2023 in the Botanical Resources Study Area, mountain bent grass. The TERR-1 Final Technical Report, included in Volume III of this DLA, shows the location of each population of mountain bent grass. At the request of the resource agencies, information was also collected on black cottonwood (*Populus trichocarpa*). Detailed information on these species is provided below. In addition, three species with a CRPR of 4.3 were observed: beautiful pussy-toes (*Antennaria pulchella*; observed in 2022 and 2023), Congdon's sedge (*Carex congdonii*; observed in 2023), and water awlwort (*Subularia aquatica* ssp. *americana*; observed in 2022). Species with a CRPR are considered to be on a watch list; they are not considered rare from a statewide perspective but are uncommon enough that their status is monitored. A complete list of plant species observed is included in the Plant Compendium of the TERR-1 Final Technical Report included in Volume III of this DLA. Federally or state rare, threatened, and endangered (RTE) plants are discussed in detail in Section 6.9, *Rare, Threatened, and Endangered Species*.

MOUNTAIN BENT GRASS

Mountain bent grass has a CRPR of 2B.3 and is designated as an SCC by the Inyo National Forest. This perennial herb blooms between July and September (CNPS, 2020). It occurs in moist to dry subalpine or alpine meadows, seeps, slopes, rock fields, and subalpine coniferous forest at elevations between approximately 3,200 and 10,500 feet amsl (Jepson Flora Project, 2023; CNPS, 2020). In California, it is known from the Klamath Ranges, the High North Coast Ranges, the High Cascade Range, and the central and southern High Sierra Nevada (Jepson Flora Project, 2023).

2022 Results

Five populations of mountain bent grass totaling approximately 854 individuals were observed in the Botanical Resources Study Area (Table 6.7-1). The majority of individuals were flowering or fruiting. Populations were observed growing in relatively barren areas along the lakeshore and below Saddlebag Dam, sometimes among scattered boulders and cobbles. This species was also observed growing in the Saddlebag Lake Campground. Associated species vary by population and include rough bent grass, abrupt-beaked sedge, umbel-bearing pussypaws (*Calyptridium umbellatum*), Newberry's beardtongue, northern goldenrod, and Anderson's alpine aster (*Oreostemma alpigenum* var. *andersonii*).

Table 6.7-1. Population Counts and Phenology of Mountain Bent Grass in 2022

Botanical Study Area	Population	Number of Individuals	Percent Vegetative	Percent Flowering/Fruiting
Saddlebag Dam and Campgrounds	1	106	10	90
	2	500	10	90
	3	48	10	90
	4	100	10	90
	5	100	10	90

2023 Results

Most populations of mountain bent grass were observed only in 2022 when lake levels were low and snow was absent from the Botanical Resources Study Area; higher lake levels and patches of snow were observed in 2023, covering many of the 2022 populations. No new populations were observed in 2023.

BLACK COTTONWOOD

Black cottonwood is not considered a special-status plant species; however, as a riparian species, it is of interest to the Stakeholders. This deciduous tree generally grows up to 100 feet tall (Jepson Flora Project, 2023). It occurs in alluvial bottomland and stream sides and elevations between approximately 16 and 10,007 feet amsl. In California, it is known throughout the California Floristic Province and the Great Basin Floristic Province.

2022 Results

Three populations of black cottonwood were observed in the Botanical Resources Study Area, all within the Poole Powerhouse area (Table 6.7-2). Population 1 consisted of two mature individuals; both individuals appeared healthy. Population 2 consisted of a cluster of eight saplings, all appearing healthy.

2023 Results

Population 1 was observed again in 2023 and appeared healthy. Population 2 was not observed in 2023. SCE conducted a large-scale tree removal effort around Poole Powerhouse in fall of 2022, after the 2022 survey occurred. The majority of trees removed were conifers (red fir [*Abies magnifica*], white fir, Jeffrey pine, and lodgepole pine) for the purposes of reducing wildfire risk and winter falling risk of large trees around the powerhouse. The tree removal was conducted according to the Project's Wildfire Mitigation Plan and VM-3 Vegetation Management Program. USFS, CDFW, and the California Waterboards were consulted before the effort occurred to ensure compliance. Population 2 of black cottonwood was presumably unintentionally removed during the 2022 wildfire clearing effort.

An additional sapling was observed in 2023, comprising Population 3.

Table 6.7-2. Population Counts and Phenology of Black Cottonwood

Botanical Study Area	Population	Number of Individuals	Percent Vegetative	Percent Flowering	Percent Fruiting
Poole Powerhouse	1	2	100	0	0
	2	8	100	0	0
	3	1	100	0	0

6.7.1.4. Non-Native Invasive Plant Species

One NNIP species of concern designated for mapping was observed in 2022 and 2023 in the Botanical Resources Study Area: cheat grass (*Bromus tectorum*). It is an annual grass that occurs in open, disturbed areas at elevations below approximately 11,155 feet amsl (Jepson Flora Project, 2023). The species is native to northern Africa, Europe, and western Asia (Kelch, 2015). It was introduced to North America independently via ship ballast, contaminated crop seed, and packing material (Kelch, 2015). It is found throughout California except the driest deserts in the southeast of the state (Jepson Flora Project, 2023; Kelch, 2015). It has a USFS treatment strategy of 3 (contain) and a Cal-IPC rating of High.

2022 RESULTS

Three populations of cheat grass were observed in 2022 in the Botanical Resources Study Area (the associated mapbook is in Appendix A in the TERR-1 Final Technical Report in Volume III of this DLA). Two populations were documented near Poole Powerhouse (Population 1 has 30 individuals; Population 2 has 60 individuals) and one was documented at Ellery Lake Campground (Population 3 has 40 individuals).

No other NNIP plant species of concern were observed in the Botanical Resources Study Area. Other NNIP species observed are reported in the Plant Compendium in the TERR-1 Final Technical Report, presented in Volume III of this DLA.

2023 RESULTS

Two additional populations of cheat grass were observed in 2023 (TERR-1 Final Technical Report in Volume III of this DLA). Both of these were documented near Poole Powerhouse (Population 4 has 5 individuals; Population 5 has 10 individuals).

6.7.2. POTENTIAL ADVERSE EFFECTS AND ISSUES

No changes in Project operations are proposed as part of the Proposed Action; therefore, no adverse environmental effects on upland botanical resources are anticipated.

6.7.2.1. Effects of Continued Project Operations and Maintenance on Vegetation Communities Within the Project Area

Thirteen vegetation communities and other areas were identified in the Biological Resources Study Area: alpine grasses and forbs, barren, developed, lakeshore, lodgepole pine, mixed conifer—fir, non-vegetated, quaking aspen, wet meadow, whitebark pine—alpine grasses and forbs, whitebark pine—lodgepole pine, water, and willow. Of these, alpine grasses and forbs, quaking aspen, wet meadow, whitebark pine—alpine grasses and forbs, whitebark pine—lodgepole pine, and willow may be considered sensitive natural communities by the CDFW (2023). Project facilities (i.e., Saddlebag Dam, spillway, and valve house; Rhinedollar Dam, tunnel intake, spillway, and valve house; Tioga Dam and Tioga Auxiliary Dam; and Poole Powerhouse) consist of existing developed structures in areas that are already disturbed or within previously disturbed and maintained areas. Therefore, there would be no effects on the existing 13 plant communities identified in the Project Area.

NO ACTION

Under the No Action, SCE would continue to operate and maintain the Project in accordance with the terms and conditions of the existing FERC license. No effects on vegetation communities as a result of Project O&M have been identified relative to baseline conditions.

The No Action is consistent with the USFS desired conditions described in Section 6.7.2.4, *Consistency with Current Resource Management Objectives*, relative to vegetation communities because the Project facilities are sited at locations that are currently disturbed or developed or in areas that are maintained on a consistent routine basis. SCE is not proposing to change its operations or maintenance practices for the Project under the new license. Project operations would not affect vegetation communities within and surrounding the Project because routine operations and maintenance do not involve expanding maintenance sites into native habitats.

PROPOSED ACTION

Under the Proposed Action, SCE proposes to continue to operate and maintain the Project similar to the No Action, with a few exceptions: (1) modification to the existing FERC Project Boundary and (2) environmental resource management plans to protect environmental resources.

No adverse environmental effects on vegetation communities are anticipated from continued operations of the Project.

Expansion of the FERC Project Boundary would include areas currently being used for O&M activities but not previously included in the existing boundary. Although the size of the Project-affected area within the proposed FERC Project Boundary would technically increase, no effects on the surrounding environment would occur because all the newly incorporated areas have been subject to ongoing operations and maintenance activities.

The Project Proposed Action is consistent with the USFS desired conditions described in Section 6.7.2.4, *Consistency with Current Resource Management Objectives*, relative to vegetation communities because the Project facilities are sited at locations that are currently disturbed or developed or in areas that are maintained on a consistent routine basis. Project operations would not affect vegetation communities within and surrounding the Project.

6.7.2.2. Effects of Continued Project Operations and Maintenance Activities on Special-Status Plant Species Within the Project Area

Project facilities (i.e., Saddlebag Dam, spillway, and valve house; Rhinedollar Dam, tunnel intake, spillway, and valve house; Tioga Dam and Tioga Auxiliary Dam; and Poole Powerhouse) consist of existing developed structures in areas that are already disturbed or within previously disturbed and maintained areas.

One special-status plant species, mountain bent grass, is located in the immediate vicinity of Project facilities at Saddlebag Dam.

NO ACTION

Under the No Action, SCE would continue to operate and maintain the Project in accordance with the terms and conditions of the existing FERC license. No effects on special-status plants as a result of Project O&M have been identified, relative to baseline conditions.

The No Action is consistent with the USFS desired conditions described in Section 6.7.2.4, *Consistency with Current Resource Management Objectives*, relative to special-status plant species because mountain bent grass is located in areas outside of routine maintenance areas, such as the shoreline of Saddlebag Lake, along the parking area for the concessionaire, outside the Saddlebag Lake trail leading to the North end of the lake, to on the dam face.

Additionally, SCE is not proposing to change its operations or maintenance practices for the Project under the new license.

PROPOSED ACTION

Under the Proposed Action, SCE proposes to continue to operate and maintain the Project similar to the No Action, with a few exceptions: (1) modification to the existing FERC Project Boundary and (2) environmental resource management plans to protect environmental resources.

No changes in Project operations are proposed as part of the Proposed Action; therefore, no adverse environmental effects on special-status plant species are anticipated from continued operations.

Expansion of the FERC Project Boundary would include areas currently being used for O&M activities but not previously included in the existing boundary. Although the size of the Project-affected area within the proposed FERC Project Boundary would technically increase, no effects on surrounding environment would occur because all the newly incorporated areas have been subject to ongoing operations and maintenance activities.

The Project Proposed Action is consistent with the USFS desired conditions described in Section 6.7.2.4, *Consistency with Current Resource Management Objectives*, relative to special-status plant species because the Project facilities are sited at locations that are currently disturbed or developed or in areas that are maintained on a consistent routine basis. With proposed PME measures, Project operations and maintenance would not affect special-status plant species within and surrounding the Project. Project O&M would not decrease forest-wide special-status plant species populations below self-sustaining levels. In addition, SCE is not proposing to change its operations or maintenance practices for the Project under the new license.

6.7.2.3. Effects of Continued Project Operations and Maintenance Activities on Non-Native Invasive Plants Within the Project Area

Project facilities (i.e., Saddlebag Dam, spillway, and valve house; Rhinedollar Dam, tunnel intake, spillway, and valve house; Tioga Dam and Tioga Auxiliary Dam; and Poole Powerhouse) consist of existing developed structures in areas that are already disturbed or within previously disturbed and maintained areas.

An existing NNIP species has been documented (i.e., cheatgrass [*Bromus tectorum*]) at Poole Powerhouse.

<u>NO ACTION</u>

Under the No Action, SCE would continue to operate and maintain the Project in accordance with the terms and conditions of the existing FERC license. No increase in population size or spread of NNIP species would be anticipated relative to baseline conditions.

The No Action is consistent with the USFS desired conditions described in Section 6.7.2.4, *Consistency with Current Resource Management Objectives*, relative to NNIP species because the Project facilities are sited at locations that are currently disturbed or developed or in areas that are maintained on a consistent routine basis. SCE is not proposing to change its operations or maintenance practices for the Project under the new license. Project operations would not affect the spread or increase the population size of NNIP species within and surrounding the Project. Routine maintenance activities that involve movement of equipment into and between Project facilities have the capacity to introduce the seed of new NNIP species into work areas. These activities may also increase the size of the population of existing NNIP species by bringing in additional seed or transporting seed around the Project.

PROPOSED ACTION

Under the Proposed Action, SCE proposes to continue to operate and maintain the Project similar to the No Action, with a few exceptions: (1) modification to the existing FERC Project Boundary and (2) environmental resource management plans to protect environmental resources.

No changes in Project operations are proposed as part of the Proposed Action; therefore, no adverse environmental effects resulting from the introduction or spread of NNIP species are anticipated from continued operations.

Expansion of the FERC Project Boundary would include areas currently being used for O&M activities but not previously included in the existing boundary. Although the size of the Project-affected area within the proposed FERC Project Boundary would technically increase, no new effects on the surrounding environment would occur because all the newly incorporated areas have been subject to ongoing operations and maintenance activities.

The Project Proposed Action is consistent with the USFS desired conditions described in Section 6.7.2.4, *Consistency with Current Resource Management Objectives*, relative to NNIP species because the Project facilities are sited at locations that are currently disturbed or developed or in areas that are maintained on a consistent routine basis. With proposed PME measures, Project O&M would not affect the spread of or increase the population size of NNIP species. In addition, SCE is not proposing to change its O&M practices for the Project under the new license.

6.7.2.4. Consistency with Current Resource Management Objectives (Forest Plans, Basin Plan, etc.)

SCE has reviewed the desired conditions in the Inyo National Forest LMP (USFS, 2019) to assess whether the Project is consistent with management objectives. The Project is consistent with the following desired conditions relating to vegetation communities, botanical resources, and invasive plant species:

- INV-FW-DC 01: Terrestrial invasive species are controlled or eradicated when possible, and establishment of new populations is prevented.
- INV-FW-DC 02: The area affected by invasive species and introduction of new invasive species is minimized.

- MA-CW-DC 01: Conservation watersheds provide high-quality habitat and functionally intact ecosystems that contribute to the persistence of SCC and the recovery of threatened, endangered, proposed, or candidate species.
- MA-CW-DC 02: Conservation watersheds exhibit long-term (multiple planning cycles) high watershed integrity and have aquatic, riparian, and terrestrial ecosystems resilient to stochastic disturbance events such as wildfires, floods, and landslides.
- MA-RCA-DC 02: Riparian conservation areas have ecological conditions that contribute to the recovery of threatened and endangered species and support persistence of SCC as well as native and desired non-native aquatic and riparian-dependent plant and animal species.
- MA-RCA-DC 08: The condition of riparian vegetation, including riparian species composition, stand density, and fuel loading, is consistent with healthy riparian systems and reduces risks from high-intensity wildfire in the watershed.
- SPEC-FW-DC 02: Habitats for at-risk species support self-sustaining populations within the inherent capabilities of the LMP area. Ecological conditions provide habitat conditions that contribute to the survival, recovery, and delisting of species under the ESA; preclude the need for listing new species; improve conditions for SCC including addressing threats (e.g., minimal effects from disease); and sustain both common and uncommon native species.
- SPEC-FW-DC 03: Land management activities are designed to maintain or enhance self-sustaining populations of at-risk species within the inherent capabilities of the plan area by considering the relationship of threats (including site-specific threats) and activities to species survival and reproduction.
- SPEC-FW-DC 04: The structure and function of the vegetation, aquatic, and riparian system and associated microclimate and smaller scale elements (like special features such as carbonate rock outcrops, fens, or pumice flats) exist in adequate quantities within the capability of the plan area to provide habitat and refugia for at-risk species with restricted distributions.
- TERR-FW-DC 01: Each vegetation type contains a mosaic of vegetation conditions, densities and structures. This mosaic, which occurs at a variety of scales across landscapes and watersheds, reflects conditions that provide for ecosystem integrity and ecosystem diversity given the inherent capabilities of the landscape that is shaped by site conditions and disturbance regimes.
- TERR-FW-DC 02: Vegetation structure and composition provide ecosystem resilience to climate change and other stressors including altered fire regimes, drought, and flooding in riparian systems.
- TERR-FW-DC 03: Functioning ecosystems retain their essential components, processes, and functions.

- TERR-FW-DC 05: Ecological conditions contribute to the recovery of threatened and endangered species, conserve proposed and candidate species, and support the persistence of SCC.

- TERR-MONT-DC 01: At the landscape scale, the Sierra Nevada montane landscape is a heterogeneous mosaic of patches of red fir forest, mixed conifer, lodgepole pine forests, Jeffrey pine forests, meadows, and riparian areas. These ecosystem types occur in a complex mosaic of different densities, sizes, and species mix across large landscapes that vary with topography, soils, and snow accumulation. The composition, structure, and function of vegetation make them resilient to fire, drought, insects and pathogens, and climate change. The mix of seral stage patches, and open versus closed canopied areas, varies by forest type as described in Table 1 and Table 2 of the Inyo National Forest LMP. Large and old trees are common in most seral stages throughout the landscape and in varying densities (see “Old Forest Habitats” section on page 19 of the Inyo National Forest LMP).

6.7.2.5. Proposed Protection, Mitigation, and Enhancement Measures

As no effects are anticipated, SCE is not proposing specific botanical mitigation measures; however, protection and avoidance measures will be included for botanical resources and to manage the potential introduction and spread of NNIP species in the Resource Management Plan (PME-4) in Appendix E.1, *Protection, Mitigation, and Enhancement Measures*.

6.8. WETLAND, RIPARIAN, AND LITTORAL RESOURCES

This section describes wetland, riparian, and littoral resources in the Project Vicinity. FERC content requirements for wetlands, riparian, and littoral resources are specified in 18 CFR § 4.51. The discussion provided here is intended to inform an evaluation of potential issues relating to the Proposed Action and how the completed studies inform the understanding of Project effects. The *General Botanical Resources Survey (TERR-1) Final Technical Report* includes a riparian monitoring component, which analyzes the results of previous monitoring efforts; the report is included in Volume III of this DLA.

Wetland, riparian, and littoral resources occur throughout the Project Vicinity bordering the creeks, lakes, and impoundments. These habitats interdigitate with the surrounding upland habitat types described in Section 6.6, *Terrestrial Wildlife Resources*, and Section 6.7, *Botanical Resources*. They also provide habitat for various wildlife species, including many amphibian species dependent upon moisture and water.

Additionally, the 2019 USFS LMP defines Riparian Conservation Areas (RCAs) as one of the applicable management areas for the Inyo National Forest (USFS, 2019). RCAs are defined by type, including (1) perennial streams; (2) seasonally flowing streams; (3) streams in inner gorge; (4) those with special aquatic features (including lakes, wet meadows, bogs, fens, wetlands, vernal pools, and springs); and (5) other hydrologic or topographic depressions without a defined channel. All Project waters are within a designated RCA.

6.8.1. AFFECTED ENVIRONMENT

Wetland, riparian, and littoral resources in the Project Area have been mapped by the USFWS and compiled in the National Wetland Inventory's (NWI) Wetland Mapper available from the Wetlands Spatial Data Layer of the National Spatial Data Infrastructure (USFWS, 2020). The NWI provides the classification of known wetlands following the Classification of Wetlands and Deepwater Habitats of the United States (FGDC, 2013). This classification system is arranged in a hierarchy of the following: (1) systems, which share the influence of similar hydrologic, geomorphologic, chemical, or biological factors (i.e., marine estuarine, riverine, lacustrine, and palustrine); (2) subsystems (i.e., subtidal and intertidal; tidal, lower perennial, upper perennial, and intermittent; or littoral and limnetic); (3) classes, which are based on substrate material and flooding regime or on vegetative life forms; (4) subclasses; and (5) dominance types, which are named for the dominant plant or wildlife forms. In addition, there are modifying terms applied to classes or subclasses.

Botanical field surveys were conducted in the Project Area in 2022 and 2023, as described in the approved study plans for TERR-1 filed with FERC in April 2022. Three study areas were surveyed as part of the TERR-1 Study:

- Botanical Resources Study Area includes all aboveground Project facilities and USFS recreation areas, with a 100-foot buffer around these areas. Survey areas were adjusted in the field based on accessibility and topography (TERR-1 Final Technical Report [Volume III of this DLA]). This study is discussed further in Section 6.7, *Botanical Resources*.

- Riparian Monitoring Study Area was developed as part of the vegetation monitoring conducted for the current FERC license, beginning in 1999. The area includes three sites along Lee Vining Creek between Saddlebag Lake and the confluence with Slate Creek (TERR-1 Final Technical Report [Volume III of this DLA]). Site 1 is located at the upstream end, Site 2 in the middle, and Site 3 at the downstream end. Vegetation data were collected at permanent transects established during baseline surveys in 1999. Data were collected at four transects at Site 1, three transects at Site 2, and three transects at Site 3. Each transect consists of a nearly 10-foot-wide belt placed perpendicular to the stream channel. For the upstream and downstream transects, belts were oriented toward the interior of the site. For the intermediate transect(s), the belt extended downstream. Additional details are provided in Read (2004, 2012, 2017, 2022).

- NDVI Study Area extends from above Saddlebag Lake to below Aspen Campground and includes eight study sites. Five test study reaches are along Lee Vining Creek downstream of Project facilities, and three outside of the Project act as controls (TERR-1 Final Technical Report [Volume III of this DLA]).

6.8.1.1. Wetland and Water Habitat Types

Habitat types change gradually with elevation and distance from water sources, but the vegetation alliances interdigitate at all elevations. For example, riparian habitat is present throughout the FERC Project Boundary at all elevations and mixes with the various upland vegetation alliances at all elevations—either as an understory or as a canopy with an upland understory. Vegetation alliances, including common plant species, and wildlife using these areas are described in detail in Section 6.6, *Terrestrial Wildlife Resources*, and Section 6.7, *Botanical Resources*. The Wet Meadows Alliance, Willow (Shrub) Alliance, and Quaking Aspen Alliance predominantly comprise the wetland, riparian, or littoral resources within the Botanical Resources Study Area.

Figure 6.8-1 shows the wetlands, riparian, and littoral resources that are identified in the NWI (USFWS, 2020). A more detailed NWI Mapbook is included as Appendix E.4. Figure 6.8-1 shows wetland features at a broad scale. This mapping is not meant to replace an on-site analysis. The NWI is generated from aerial photography interpretation; therefore, the categories listed may not reflect what is present on the ground. The NWI is mostly used as a preliminary mapping tool to serve as a basis for future field investigations. For this relicensing, the NWI is used to provide a general inventory of the types of wetland and water-related habitats present though out the Project Area. Five Cowardin (Cowardin et al., 1979) classification codes are identified by the NWI: PEM1B, PSSC, PUBH, L1UBHh, and R3RBH. Each code is a combination of various acronyms. For example, PEM1B is a combination of “P,” “EM,” “1,” and “B.” The Cowardin codes in the Project Area are described in detail in the subsections below. Table 6.8-1 lists the wetland, riparian, or littoral resource types and areas they represent, both in acres and as percentages of the total mapped area.

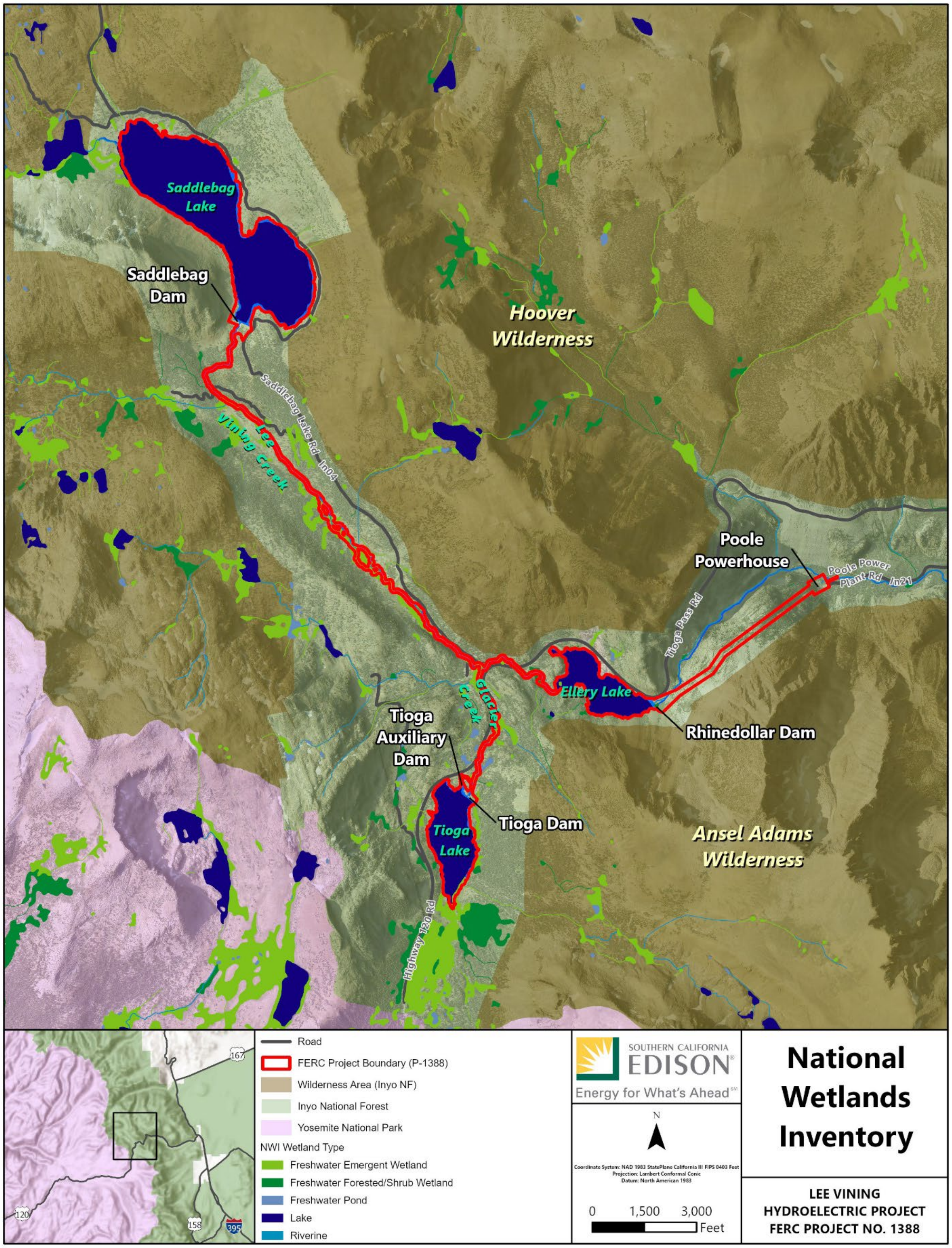


Figure 6.8-1. National Wetlands Inventory Features in the Project Boundary.

Table 6.8-1. Summary of Wetland, Riparian, or Littoral Resource Types as Cowardin Class and Acreages in the Project Boundary

Wetland Resource Type	Cowardin Code	Number of Polygons	Acres	Percent Coverage
Freshwater Emergent Wetland	PEM1B, PEM1C, PEM1Ch	47	142.9	23
Freshwater Forested/Shrub Wetland	PFOA, PSSB, PSSC, PSSCh	9	5.1	0.8
Freshwater Pond	PUBH	1	2.4	0.4
Lake	L1UBHh, L2USCh	5	422.7	68.2
Riverine	R4SBC, R5UBF, R3RBH, R3RBHx, R3UBH	11	46.9	7.6
Grand Total	**—**	**73**	**620**	**100.0**

FRESHWATER EMERGENT WETLAND / COWARDIN CLASSIFICATION CODE: PEM1B

System Palustrine (P): The Palustrine System includes all nontidal wetlands dominated by trees, shrubs, persistent emergents, emergent mosses or lichens, and all such wetlands that occur in tidal areas where salinity due to ocean-derived salts is below 0.5 part per thousand (ppt). It also includes wetlands lacking such vegetation but with all of the following four characteristics: (1) area less than 20 acres; (2) active wave-formed or bedrock shoreline features lacking; (3) water depth in the deepest part of basin less than 8.2 feet at lowest water; and (4) salinity due to ocean-derived salts less than 0.5 ppt.

Class Emergent (EM): This is characterized by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. This vegetation is present for most of the growing season in most years. These wetlands are usually dominated by perennial plants.

Subclass Persistent (1): This is dominated by species that normally remain standing at least until the beginning of the next growing season. This subclass is found only in the Estuarine and Palustrine Systems.

Water Regime Seasonally Saturated (B): The substrate is saturated at or near the surface for extended periods during the growing season, but unsaturated conditions prevail by the end of the season in most years. Surface water is typically absent but may occur for a few days after heavy rain and upland run-off.

FRESHWATER FORESTED/SHRUB WETLAND / COWARDIN CLASSIFICATION CODE: PSSC

System Palustrine (P): The Palustrine System includes all nontidal wetlands dominated by trees, shrubs, persistent emergents, emergent mosses or lichens, and all such wetlands that occur in tidal areas where salinity due to ocean-derived salts is below

0.5 ppt. It also includes wetlands lacking such vegetation but with all of the following four characteristics: (1) area less than 20 acres; (2) active wave-formed or bedrock shoreline features lacking; (3) water depth in the deepest part of basin less than 8.2 feet at low water; and (4) salinity due to ocean-derived salts less than 0.5 ppt.

Class Scrub-Shrub (SS): This includes areas dominated by woody vegetation less than 20 feet tall. The species include true shrubs, young trees (saplings), and trees or shrubs that are small or stunted because of environmental conditions.

Water Regime Seasonally Flooded (C): Surface water is present for extended periods especially early in the growing season but is absent by the end of the growing season in most years. The water table after flooding ceases is variable, extending from saturated to the surface to a water table well below ground surface.

FRESHWATER POND / COWARDIN CLASSIFICATION CODE: PUBH

System Palustrine (P): The Palustrine System includes all nontidal wetlands dominated by trees, shrubs, persistent emergents, emergent mosses or lichens, and all such wetlands that occur in tidal areas where salinity due to ocean-derived salts is below 0.5 ppt. It also includes wetlands lacking such vegetation but with all of the following four characteristics: (1) area less than 20 acres; (2) active wave-formed or bedrock shoreline features lacking; (3) water depth in the deepest part of basin less than 8.2 feet at low water; and (4) salinity due to ocean-derived salts less than 0.5 ppt.

Class Unconsolidated Bottom (UB): This includes all wetlands and deepwater habitats with at least 25 percent cover of particles smaller than stones (less than about 2 to 3 inches) and a vegetative cover less than 30 percent.

Water Regime Permanently Flooded (H): This is water that covers the substrate throughout the year in all years.

LAKE / COWARDIN CLASSIFICATION CODE: L1UBHH

System Lacustrine (L): The Lacustrine System includes wetlands and deepwater habitats with all of the following characteristics: (1) situated in a topographic depression or a dammed river channel; (2) lacking trees, shrubs, persistent emergents, and emergent mosses or lichens with 30 percent or greater areal coverage; and (3) total area of at least 20 acres. Similar wetlands and deepwater habitats totaling less than 20 acres are also included in the Lacustrine System if an active wave-formed or bedrock shoreline feature makes up all or part of the boundary or if the water depth in the deepest part of the basin equals or exceeds 8.2 feet at low water. Lacustrine waters may be tidal or nontidal, but ocean-derived salinity is always less than 0.5 ppt.

Subsystem Limnetic (1): This subsystem includes all deepwater habitats (i.e., areas greater than 8.2 feet deep below low water) in the Lacustrine System. Many small Lacustrine Systems have no Limnetic Subsystem.

Class Unconsolidated Bottom (UB): This includes all wetlands and deepwater habitats with at least 25 percent cover of particles smaller than stones (less than 2 to 3 inches) and a vegetative cover less than 30 percent.

Water Regime Permanently Flooded (H): This is water that covers the substrate throughout the year in all years.

Special Modifier Diked/Impounded (h): These wetlands have been created or modified by a manmade barrier or dam that obstructs the inflow or outflow of water.

RIVERINE / COWARDIN CLASSIFICATION CODE: R3RBH

System Riverine (R): The Riverine System includes all wetlands and deepwater habitats contained within a channel, with two exceptions: (1) wetlands dominated by trees, shrubs, persistent emergents, emergent mosses, or lichens, and (2) habitats with water containing ocean-derived salts of 0.5 ppt or greater. A channel is an open conduit either naturally or artificially created that periodically or continuously contains moving water or that forms a connecting link between two bodies of standing water.

Subsystem Upper Perennial (3): This subsystem is characterized by a high gradient. There is no tidal influence, and some water flows all year except during years of extreme drought. The substrate consists of rock, cobbles, or gravel with occasional patches of sand. The natural dissolved oxygen concentration is normally near saturation. The fauna is characteristic of running water, and there are few or no planktonic forms. The gradient is high compared with that of the Lower Perennial Subsystem, and there is very little floodplain development.

Class Rock Bottom (RB): This includes all wetlands and deepwater habitats with substrates having an aerial cover of stones, boulders, or bedrock 75 percent or greater and vegetative cover of less than 30 percent.

Water Regime Permanently Flooded (H): This is water that covers the substrate throughout the year in all years.

6.8.1.2. Primary Drainages

LEE VINING CREEK

Saddlebag Lake is fed by seasonal snowmelt. Flows from Saddlebag Lake Dam are the headwaters of Lee Vining Creek. Lee Vining Creek flows through a riparian corridor with a series of freshwater emergent wetlands, where it is joined by a tributary, Slate Creek.

The creek flows through a culvert under Saddlebag Lake Road and another culvert under State Route 120, where it meanders through emergent wetlands and forested/shrub wetlands into Ellery Lake.

GLACIER CREEK

Glacier Creek begins from snowmelt on Mount Dana, east of Tioga Lake. The creek flows downstream into Tioga Lake where it enters the FERC Project Boundary. Flows from Tioga Dam continue through ponds centering on freshwater emergent wetlands and then continue through a culvert under State Route 120. Glacier Creek is joined by Mine Creek, a tributary, and then flows to join Lee Vining Creek near the intersection of Saddlebag Lake Road and State Route 120.

6.8.1.3. Riparian Monitoring

Conditions incorporated by FERC into the previous license, issued February 4, 1997, required SCE to conduct biological and hydrological monitoring on Lee Vining Creek to evaluate potential effects of stream regulation on riparian and aquatic resources. These requirements were specified by the Inyo National Forest. Staff of the Inyo National Forest, with assistance from SCE, selected a total of three riparian monitoring reaches on Lee Vining Creek between Saddlebag Lake and the confluence of Lee Vining Creek with Slate Creek, an unregulated/undiverted stream. A riparian and aquatic resource monitoring program with baseline (Phase 1) and long-term (Phase 2) components was developed by the Inyo National Forest and implemented by SCE personnel at these three sites. The baseline phase of the program was conducted in 1999, 2000, and 2001. The first year of the post-baseline monitoring phase was completed in 2006, the second year was completed in 2011, the third year was completed in 2016, and the fourth year was completed in 2021.

The following is a summary of riparian monitoring methods performed as part of the previous license. A complete description of methods can be found in Read (2004, 2012, 2017, 2022). Herbaceous data were collected in approximately 32-foot square quadrats nested within each transect belt. Parameters measured within each quadrat consisted of cover (by species) and species richness.

Tree and shrub data were collected within the entire nearly 10-foot-wide transect belts. Parameters collected for each tree or shrub species included location within the belt, canopy cover, height, and size class.

Variability in species cover was observed among sites, vegetation types (i.e., riparian shrub, riparian herb, upland tree, upland shrub, and upland herb), and monitoring years. Some vegetation has remained relatively stable over the course of the monitoring (e.g., riparian shrub cover at Site 1). In other cases, there has been variability between years (e.g., upland conifer cover). The most pronounced change in vegetation cover was a decrease in upland herb cover at Site 3 from a high of 92 percent in 2000 and to a low of 28 percent in 2021. Both riparian and upland herbaceous species richness also decreased over the course of the monitoring period at all sites. Given that the observed variability has occurred in both riparian and upland species, it is likely more related to environmental factors outside of the Project’s control.

The latest riparian monitoring report summarizes data between the baseline years and 2021 (Read, 2022).

6.8.1.4. Normalized Difference Vegetation Index Analysis

NDVI was used to assess riparian conditions under Project operations and the potential effects of hydro-resource optimization on riparian resources. The NDVI Study Area extends from above Saddlebag Lake to below Aspen Campground (Table 6.8-2 and the associated mapbook in the TERR-1 Final Technical Report [Volume III of this DLA]). The study area is comprised of eight study sites. Test reaches were located along Lee Vining Creek, within or adjacent to the FERC Project Boundary, that are downstream of Project water releases, including MIFs and hydro-optimization. Control areas include a reach along Lee Vining Creek that is upstream of any Project facility (i.e., upstream of Saddlebag Lake) and tributaries to Lee Vining Creek (i.e., Mine Creek and Slate Creek).

Table 6.8-2. Normalized Difference Vegetation Index Study Sites and Source for Delimiting Sampling Plots

Study Site	Control or Test	Site Affected by Hydro-Resource Optimization?	Willow Riparian Scrub Vegetation Determination	Wet Meadow Vegetation Determination
AS	Control	No	Vegetation determined to be willow riparian scrub based on Google Earth aerial imagery	Vegetation determined to be wet meadow based on Google Earth aerial imagery
USC	Control	No	Vegetation determined to be willow riparian scrub based on Google Earth aerial imagery	Vegetation determined to be wet meadow based on Google Earth aerial imagery
MC	Control	No	Vegetation determined to be willow riparian scrub based on Google Earth aerial imagery	Vegetation determined to be wet meadow based on Google Earth aerial imagery
BS	Test	No	Vegetation determined to be willow riparian scrub based on field survey; dominated by gray-leafed Sierra willow (*Salix orestera*)	Wet meadow vegetation community not present

Study Site	Control or Test	Site Affected by Hydro-Resource Optimization?	Willow Riparian Scrub Vegetation Determination	Wet Meadow Vegetation Determination
ULV	Test	No	Vegetation determined to be willow riparian scrub based on field survey; mix of Sierra willow (*Salix eastwoodiae*), tea-leafed willow (*Salix planifolia*), Jepson's willow (*Salix jepsonii*), and gray-leafed Sierra willow	Vegetation determined to be wet meadow based on field survey; dominated by a mix of grasses and forbs, including Pacific onion (*Allium validum*), alpine groundsel (*Packera pauciflora*), sedges (*Carex* spp.), and rushes (*Juncus* spp.)
MLV	Test	No	Vegetation determined to be willow riparian scrub based on Google Earth aerial imagery	Vegetation determined to be wet meadow based on Google Earth aerial imagery
BE	Test	No	Vegetation determined to be willow riparian scrub based on field survey; dominated by gray-leafed Sierra willow	Wet meadow vegetation community not present
LLV	Test	Yes	Vegetation determined to be willow riparian scrub based on field survey; dominated by narrowleaved willow (*Salix exigua*)	Vegetation determined to be wet meadow based on field survey; dominated by sedges and rushes

AS = Above Saddlebag; BE = Below Ellery; BS = Below Saddlebag; LLV = Lower Lee Vining; MC = Mine Creek; MLV = Middle Lee Vining; ULV = Upper Lee Vining; USC = Upper Slate Creek

An NDVI analysis was performed for willow riparian scrub and wet meadow communities on select study sites of the riparian corridor. Study sites were selected visually based on the presence of a relatively uniform riparian plant community (i.e., willow riparian scrub with or without a wet meadow) that was not obscured by a conifer canopy, as identified by Google Earth aerial imagery and field surveys. Sites were selected that had a willow cover large enough to support 10 replicate sampling plots of approximately 107 square feet each. The number and size of sampling plots per study site was constrained because some study sites had limited willow extent. For each study site, sampling plots were placed within areas of relatively homogeneous willow riparian scrub or wet meadow (where present). Plots were repositioned to minimize the amount of non-vegetative landcover (e.g., rock, trail) or shadow within the plot boundary as shown in the 2016 and 2021 imagery flown for the long-term riparian monitoring study.

NDVI quantifies vegetation by measuring the difference between near-infrared (NIR), which vegetation strongly reflects, and red light (R), which vegetation absorbs. This reports the "greenness" of vegetation, which is used as a proxy for vegetation health (i.e., high NDVI values represent healthier vegetation) (GISGeography, 2022).

$$NDVI = (NIR - R)/(NIR + R)$$

The mean NIR and R values were obtained for each sampling plot using the false color infrared aerial imagery flown as part of the current license requirement for riparian monitoring. Aerial imagery was flown by Keystone Aerial Surveys on August 12, 2016, and August 2, 2021. The flight line extended from just upstream of Saddlebag Lake to the SCE substation in the town of Lee Vining. Pixel resolution of the imagery was approximately 4 inches for aerials flown in 2021 and 6 inches for aerials flown in 2016.

Values were obtained using the NDVI tool in ArcGIS software. The average and standard deviation of NDVI values were calculated for each of the eight study sites.

Vegetation indices are used to measure biomass or vegetative vigor using combinations of several spectral values (Campbell and Wynne, 2011). The NDVI is one form of vegetation index that is constrained to vary within limits (i.e., between -1 and +1). A high NDVI value indicates healthy vegetation because it reflects more NIR and green light compared to other wavelengths and absorbs more red and blue light. Table 6.8-3 and Figure 6.8-2 summarizes the 2016 and 2021 NDVI data for willow riparian scrub at both control and test sites. While there is variability among sites and between years, there appears to be no obvious trends when comparing control to test sites or when comparing 2016 and 2021 data.

Table 6.8-3. Summary of Normalized Difference Vegetation Index Data for Willow Riparian Scrub in 2016 and 2021

Site [a]	Mean (2016)	Mean (2021)	Standard Deviation (2016)	Standard Deviation (2021)	Minimum (2016)	Minimum (2021)	Maximum (2016)	Maximum (2021)
AS	*0.338*	*0.291*	*0.039*	*0.063*	*0.209*	*0.055*	*0.437*	*0.473*
USC	*0.415*	*0.369*	*0.036*	*0.054*	*0.307*	*0.180*	*0.489*	*0.500*
MC	*0.447*	*0.437*	*0.040*	*0.040*	*0.347*	*0.305*	*0.592*	*0.570*
BS	0.326	0.321	0.043	0.047	0.218	0.119	0.438	0.487
ULV	0.371	0.349	0.043	0.051	0.111	0.138	0.488	0.482
MLV	0.442	0.434	0.041	0.046	0.258	0.223	0.519	0.569
BE	0.321	0.468	0.060	0.040	0.102	0.331	0.437	0.582
LLV	0.333	0.405	0.044	0.061	0.198	0.220	0.454	0.590

AS = Above Saddlebag; BE = Below Ellery; BS = Below Saddlebag; LLV = Lower Lee Vining; MC = Mine Creek; MLV = Middle Lee Vining; ULV = Upper Lee Vining; USC = Upper Slate Creek
[a] Site names in italics are control sites; site names not in italics are test sites.

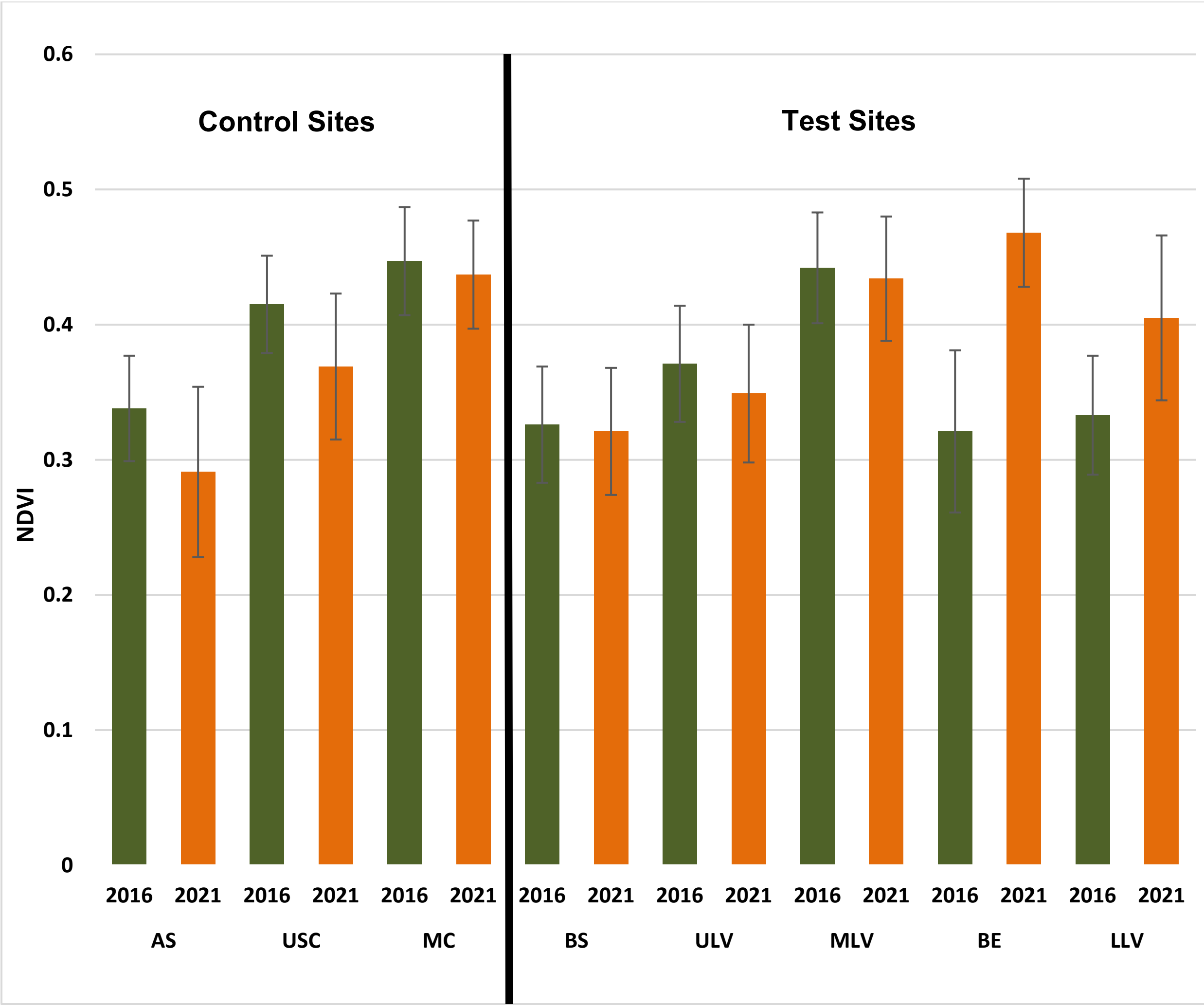


Figure 6.8-2. Mean Normalized Difference Vegetation Index (+/- Standard Deviation) for Control and Test Willow Riparian Scrub.

Table 6.8-4 and Figure 6.8-3 summarize the 2016 and 2021 NDVI data for wet meadow at both control and test sites. While there is variability among sites and between years, there appears to be no obvious trends when comparing control to test sites or when comparing 2016 and 2021 data. The most noticeable change is an increase in NDVI for the Lower Lee Vining site between 2016 and 2021.

Table 6.8-4. Summary of Normalized Difference Vegetation Index Data for Wet Meadow in 2016 and 2021

Site [a]	Mean (2016)	Mean (2021)	Standard Deviation (2016)	Standard Deviation (2021)	Minimum (2016)	Minimum (2021)	Maximum (2016)	Maximum (2021)
AS	*0.148*	*0.126*	*0.037*	*0.036*	*0.059*	*0.026*	*0.251*	*0.223*
USC	*0.224*	*0.190*	*0.066*	*0.070*	*0.102*	*0.029*	*0.358*	*0.344*
MC	*0.186*	*0.216*	*0.054*	*0.048*	*0.075*	*0.092*	*0.354*	*0.354*
ULV	0.202	0.205	0.078	0.088	0.014	-0.029	0.344	0.388
MLV	0.253	0.277	0.080	0.052	0.099	0.145	0.402	0.447
LLV	0.186	0.392	0.058	0.059	0.062	0.191	0.333	0.523

AS = Above Saddlebag; LLV = Lower Lee Vining; MC = Mine Creek; MLV = Middle Lee Vining; ULV = Upper Lee Vining; USC = Upper Slate Creek

[a] Site names in italics are control sites; site names not in italics are test sites.

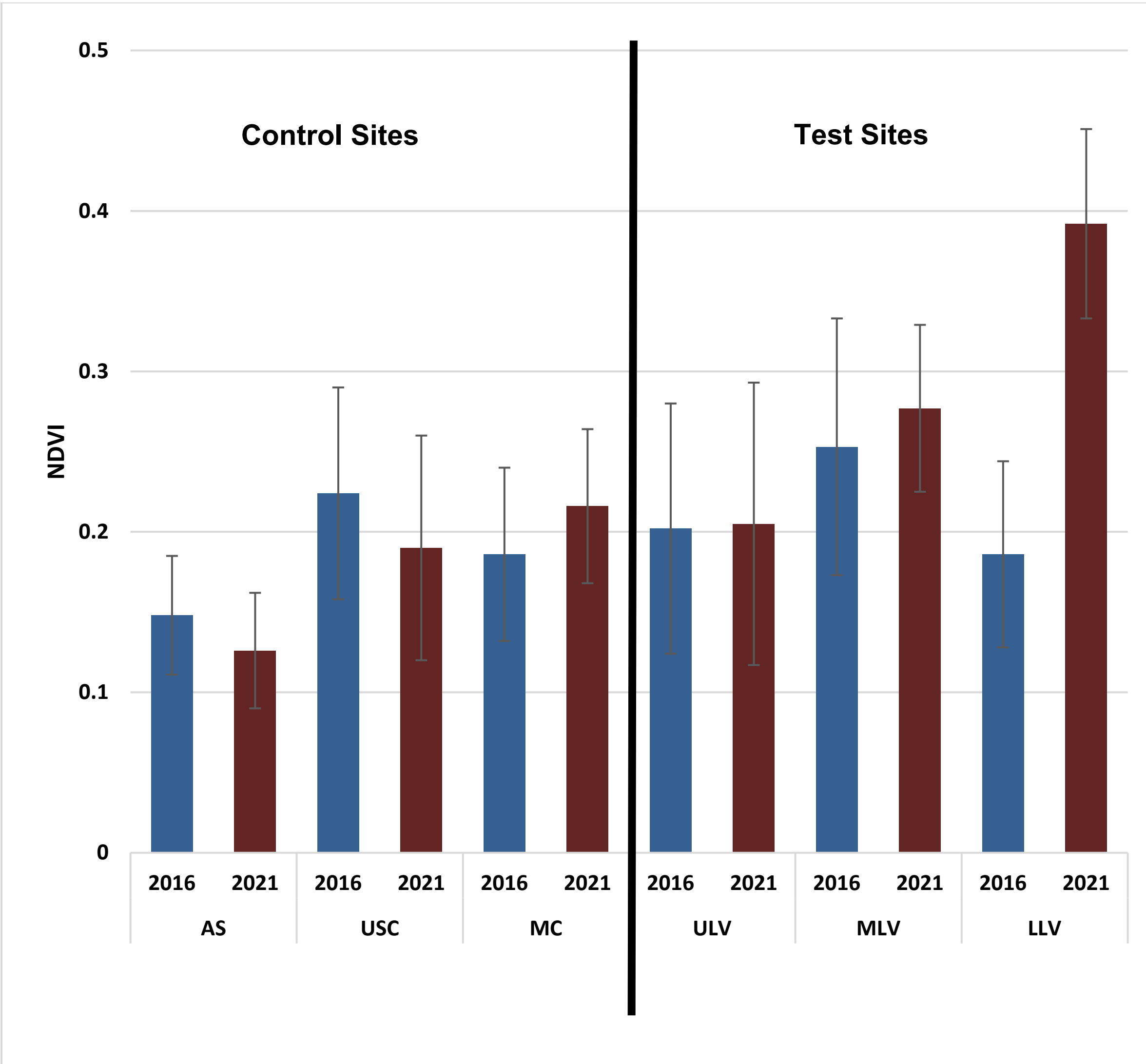


Figure 6.8-3. Mean Normalized Difference Vegetation Index for Control and Test Wet Meadow Habitat.

6.8.2. Potential Adverse Effects and Issues

This section describes the environmental effects on wetland, riparian, and littoral resources.

6.8.2.1. Effects of Project Operations and Maintenance on Wetland, Riparian, and Littoral Resources

Project facilities consist of existing developed structures in areas that are already disturbed or within previously disturbed and maintained areas. Wetland, riparian, and littoral resources occur in the surrounding areas. Based on the information gathered by the botanical study, NDVI study, and riparian monitoring, SCE operations has not affected wetland, riparian, and littoral resources.

NO ACTION

Under the No Action, SCE would continue to operate and maintain the Project in accordance with the terms and conditions of the existing FERC license. No adverse effects on wetland, riparian, and littoral habitat resources as a result of Project O&M have been identified, relative to baseline conditions.

PROPOSED ACTION

No changes in Project operations are proposed as part of the Proposed Action; therefore, no adverse environmental effects on wetland, riparian, and littoral resources are anticipated from continued operations.

Adjustment of the existing FERC Project Boundary would include areas currently being used for O&M activities but not previously included in the boundary. No new effects are anticipated as all of the newly incorporated areas have been subject to ongoing disturbance.

Maintenance activities would continue to be located in developed areas or areas that are disturbed and routinely maintained. The activities and other Project operations would not affect the surrounding riparian areas, wetlands, or littoral areas because SCE is not proposing to change O&M for the Project under the new license.

6.8.2.2. Consistency with Current Resource Management Objectives (Forest Plans, Basin Plan, etc.)

SCE reviewed the desired conditions in the Inyo National Forest LMP (USFS, 2019) to assess whether the Project is consistent with management objectives. Both the No Action and the Proposed Action are consistent with the USFS desired conditions described below, as the Project facilities are sited at locations that are currently disturbed or developed or in areas that are maintained on a consistent routine basis. Maintenance practices are restricted to disturbed or developed areas, and operations with regard to water management would remain consistent with existing conditions. The desired conditions relating to wetland, riparian, and littoral resources, with which the Project is consistent, include the following (USFS, 2019):

- MA-CW-DC 01: Conservation watersheds provide high-quality habitat and functionally intact ecosystems that contribute to the persistence of species of conservation concern and the recovery of threatened, endangered, proposed, or candidate species.
- MA-RCA-DC 02: RCAs have ecological conditions that contribute to the recovery of threatened and endangered species and support persistence of species of conservation concern, as well as native and desired nonnative aquatic and riparian-dependent plant and animal species.
- MA-RCA-DC 08: The condition of riparian vegetation (including riparian species composition, stand density, and fuel loading) is consistent with healthy riparian systems and reduces risks from high-intensity wildfire in the watershed.

- RCA-MEAD-DC 02: Wetlands and groundwater-dependent ecosystems (including springs, seeps, fens, wet meadows, and associated wetlands or riparian systems) support stable herbaceous and woody vegetation communities that are resilient to drought, climate change, and other stressors. Root masses stabilize stream channels, shorelines, and soil surfaces. The natural hydrologic, hydraulic, and geomorphic processes in these ecosystems sustain their unique functions and biological diversity.

- RCA-MEAD-DC 05: Meadows have substantive ground cover and a rich and diverse species composition, especially of grasses and forbs. Meadows have high plant functional diversity with multiple successional functional types represented. Perennial streams in meadows contain a diversity of age classes of shrubs along the streambank, where the potential exists for these plants.

- RCA-MEAD-DC 06: A complexity of meadow habitat types and successional patterns support native plant and animal communities. Meadow species composition is predominantly native, where graminoid (grass-like) species are well represented and vigorous and regeneration occurs naturally. Healthy stands of willow, alder, and aspen are present within and adjacent to meadows with suitable physical conditions for these species. Natural disturbances and management activities are sufficient to maintain desired vegetation structure, species diversity, and nutrient cycling.

- RCA-RIV-DC 03: Instream flows are sufficient to sustain desired conditions of riparian, aquatic, wetland, and meadow habitats and retain patterns of sediment nutrients and wood routing as close as possible to those with which aquatic and riparian biota evolved. The physical structure and condition of streambanks and shorelines minimize erosion and sustain desired habitat diversity.

6.8.2.3. Proposed Protection, Mitigation, and Enhancement Measures

SCE proposes to maintain current operations at the Project and maintain current MIF requirements. Under the Proposed Action, this includes continued implementation of several existing PME measures and Management Plans to protect or enhance wetland, riparian or littoral resources:

- PME-1: MIF requirements

- PME-2: Reservoir level requirements

- PME-4: Resource Management Plan

6.9. RARE, THREATENED, AND ENDANGERED SPECIES

This section describes species listed as rare, threatened or endangered (RTE) with potential to occur in the Project Vicinity. The discussion provided here is intended to inform an evaluation of potential issues relating to the Project and how the completed studies inform the understanding of Project effects. The terms “threatened” and “endangered” are specific to species listed or formally proposed to be listed under the federal ESA and the California ESA. The term “rare” is specific to the designation associated with only plant species under the California ESA (CDFW, 2020a). This section also describes species listed in the federal BGEPA and species listed as fully protected under the California Fish and Game Code (CFGC). Collectively, the species discussed in this section are referred to as RTE species.

The General Botanical Resources Survey (TERR-1) and the General Wildlife Resources Survey (TERR-2), including surveys for Yosemite toad (*Anaxyrus canorus*), were conducted in 2022 and 2023 for the Project. One additional year of limited surveys for Yosemite toad will be conducted in 2024. During the TWG meetings, SCE and Stakeholders identified the need to conduct botanical resources and terrestrial wildlife resources studies to determine the presence of RTE species and their habitats in the FERC Project Boundary. The TERR-1 and TERR-2 Final Technical Reports are included in Volume III of this DLA.

The area assessed for wildlife RTE species includes the FERC Project Boundary plus a 200-foot buffer, hereinafter referred to as the Wildlife Study Area. The Wildlife Study Area extends from the reservoir behind Saddlebag Dam to the Poole Powerhouse tailrace (Figure 6.6-1 in Section 6.6, *Terrestrial Wildlife Resources*). The Wildlife Study Area includes Project reservoirs (Saddlebag Lake, Tioga Lake, and Ellery Lake) and Project-affected stream reaches including Lee Vining Creek between Saddlebag Dam and Ellery Lake, between Rhinedollar Dam and Poole Powerhouse, and between Poole Powerhouse and the LADWP’s Lee Vining Creek diversion dam impoundment. It also includes the Glacier Creek reach between Tioga Dam and its confluence with Lee Vining Creek.

The area assessed for plant RTE species includes the FERC Project Boundary plus a 100-foot buffer, hereinafter referred to as the Botanical Resources Study Area. The Botanical Resources Study Area extends from the reservoir behind Saddlebag Dam to the Poole Powerhouse tailrace (Figure 6.7-1 in Section 6.7, *Botanical Resources*). The Botanical Resources Study Area includes Project facilities around Saddlebag Dam, Rhinedollar Dam, Tioga Dam, and Poole Powerhouse, as well as recreation facilities (i.e., the Penstock Trail by Rhinedollar Dam, Sawmill Campground, Junction Campground, Ellery Lake Campground, Tioga Lake Campground, and Ellery Lake Overlook).

6.9.1. Affected Environment

6.9.1.1. Definitions

For the purposes of this section, the following terms are defined below as follows.

Federal

A **federally threatened species** is one likely to become endangered within the foreseeable future throughout all or a significant portion of its range. A **federally endangered species** is one facing extinction throughout all or a significant portion of its geographic range (16 USC §§ 1531–1544). The presence of any federally listed threatened or endangered species in a project area generally imposes severe constraints on projects, particularly if projects should result in “take” of the species or its habitat. The term take means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in such conduct. Harm in this sense can include any disturbance of species’ habitats during any portion of its life history (16 USC §§ 1531–1544).

Proposed species or **candidate species** are those officially proposed by the USFWS for addition to the federal threatened and endangered species list. Because proposed species may soon be listed as threatened or endangered, these species could become listed prior to or during implementation of a project.

At-risk species are federally threatened, endangered, proposed, and candidate species, as well as SCC, within a plan or forest area as designated by the USFS (USFS, 2019).

California

The state of California considers an **endangered species** to be one whose prospects of survival and reproduction are in immediate jeopardy, a **threatened species** as one present in such small numbers throughout its range that it is likely to become an endangered species in the near future in the absence of special protection or management, and a **rare species** as one present in such small numbers throughout its range that it may become endangered if its present environment worsens (CFGC Division 3, Chapter 1.5; CDFW and California Fish & Game Commission, 2021). Rare species status applies only to California native plants. State-listed threatened and endangered wildlife species are protected against take unless an Incidental Take Permit is obtained from the resource agencies. Species designated as **candidate** under the California ESA are also included in the RTE species discussion.

The state of California created the **fully protected** classification to identify and provide additional protection to those animals that are rare or that face possible extinction. Lists were created for fish, amphibians and reptiles, birds, and mammals. Most of the species on these lists have subsequently been listed under the California and/or federal ESAs; however, some have not been formally listed.

The Native Plant Protection Act (NPPA) allows the California Fish and Game Commission to designate plants as rare or endangered. There are 64 species, subspecies, and varieties of plants that are protected as “rare” under the NPPA. The NPPA prohibits take of endangered or rare native plants but includes some exceptions for agricultural and nursery operations; emergencies; and after properly notifying the CDFW for vegetation removal from canals, roads, and other sites, changes in land use, and in certain other situations.

Various sections of the CFGC provide lists of fully protected reptile and amphibian (§ 5050), bird (§ 3511), and mammal (§ 4700) species that may not be taken, without authorization from the CDFW and only under specific circumstances.

6.9.1.2. Rare, Threatened, and Endangered Plant Species

Only one plant species listed as rare, endangered, or threatened under the federal ESA is known to occur within the vicinity of the Botanical Resources Study Area: whitebark pine (*Pinus albicaulis*), which is listed as a threatened species under the federal ESA as of December 2022 (87 *Federal Register* 240 [December 15, 2022]) and is designated as SCC by the Inyo National Forest. Observations of whitebark pine that occurred during the TERR-1 Study are shown on Figure 6.9-1.

This evergreen tree occurs in upper red-fir forest to the timberline, especially in subalpine forests at elevations between approximately 6,500 and 12,100 feet amsl (Jepson Flora Project, 2024). In California, it is known from the Klamath Ranges; the High Cascade Range; the northern, central, and southern High Sierra Nevada; the Warner Mountains; the White and Inyo Mountains; and areas east of the Sierra Nevada. Whitebark pine occurs from the Canadian Rocky Mountains to the southern terminus of the Sierra Nevada. Its range includes the Glacier Creek and Lee Vining Creek watersheds in the FERC Project Boundary. All recent and historical occurrence records within these watersheds were mapped in a query on Calflora.org that also pulled from several sources (i.e., Consortium of California Herbaria, iNaturalist.org, and land manager surveys and checklists) (Calflora, 2020). Whitebark pine was detected in rocky upland habitat along Lee Vining Creek within the FERC Project Boundary during SCE’s 2016 riparian monitoring for the Project (Read, 2017).

The species is declining in the Sierra Nevada due to low recruitment (Leirfallom et al., 2015; Maloney, 2014; Keane et al., 1990) combined with high mortality (Meyer et al., 2016; Millar et al., 2012), largely due to extensive mountain pine beetle (*Dendroctonus ponderosae*) infestations and a small extent due to white pine blister rust (*Cronartium ribicola*) (Jules et al., 2016; Millar et al., 2012). Little recruitment has been observed at high elevations, contrary to modeled predictions (Flanary and Keane, 2019; Dolanc et al., 2012). Prospects of adaptation to climate change in the Sierra Nevada are high (Lind et al., 2017; McLane and Aitken, 2012; Millar et al., 2012), and methods of assisting existing and future populations to develop resistance to the beetle have been found (Liu et al., 2017). Many studies have found that infrequent, low intensity fire promotes recruitment (Amberson et al., 2018; Goeking et al., 2019; Keane et al., 1990; Leirfallom et al., 2015; Loehman et al., 2017; Pansing and Tomback, 2019, Retzlaff et al., 2018; Slaton et al., 2019). Recovery is expected if land managers facilitate the increase in pest resistance; climate change resilience; the free flow of genetic material, and manage wildfire (Environment and Climate Change Canada, 2017; Keane et al., 2012).

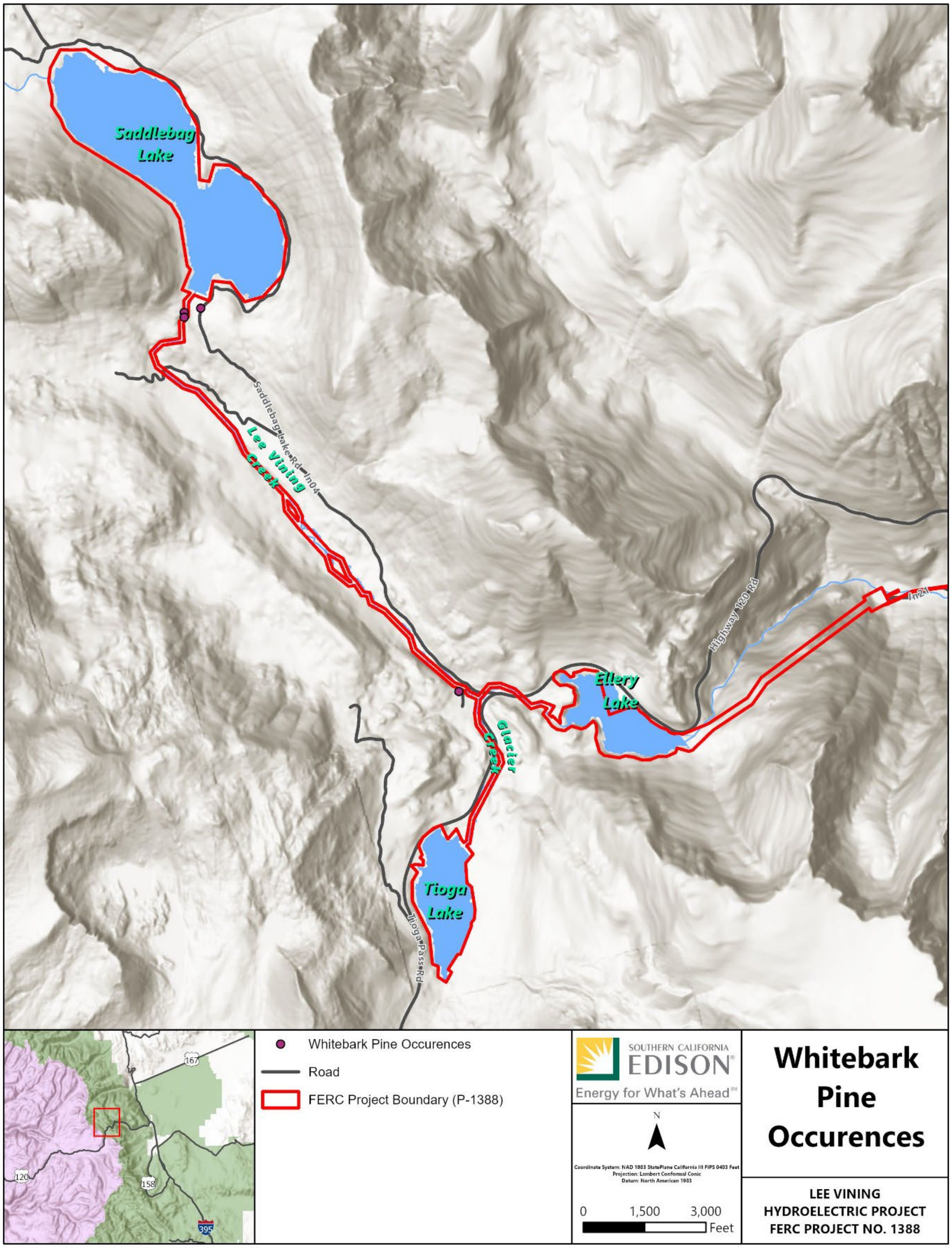


Figure 6.9-1. Whitebark Pine Observations during TERR-1 Surveys.

2022 SURVEY RESULTS

Twenty-four populations of whitebark pine totaling approximately 1,069 individuals were observed in the Botanical Resources Study Area in 2022 and 2023 (Table 6.9-1). Populations were observed at Rhinedollar Dam and along the Penstock Trail, Saddlebag Dam and Campgrounds, Ellery Lake Campground, Sawmill Campground, Tioga Dam and Tioga Auxiliary Dam, and Tioga Lake Campground portions of the Botanical Resources Study Area. The species was observed in several vegetation types, including whitebark pine forest, whitebark pine alpine, willow scrub, and wet meadow vegetation types. Associated species vary by site and include lodgepole pine (*Pinus contorta*), gray-leafed Sierra willow (*Salix orestera*), Brewer's mountain heather (*Phyllodoce breweri*), western Labrador tea (*Rhododendron columbianum*), whitestem goldenbush (*Ericameria discoidea*), dwarf bilberry (*Vaccinium cespitosum*), fireweed (*Chamaenerion angustifolium*), compact spear phacelia (*Phacelia hastata*), Newberry's beardtongue (*Penstemon newberryi*), squirreltail (*Elymus elymoides*), Sierra beardtongue (*Penstemon heterodoxus*), frosted wild buckwheat (*Eriogonum incanum*), and thread-leaved sedge (*Carex filifolia*). Populations 1 through 17 were documented in 2022, totaling approximately 1,004 individuals.

2023 SURVEY RESULTS

Populations 1 through 17, initially documented in 2022, were confirmed in 2023. Populations 18 through 24 were documented in 2023, totaling an additional 65 individuals.

Table 6.9-1. Population Counts and Phenology of Whitebark Pine in 2022 and 2023

Botanical Resources Study Area Location	Population	Number of Individuals	Percent Vegetative	Percent Flowering/Fruiting
Rhinedollar Dam and Penstock Trail	1	2	50	50
	2	1	100	0
	3	2	100	0
	4	300	75	25
	5	12	33	67
	6	300	75	25
Ellery Lake Campground	9	2	0	100
	10	3	33	67
Sawmill Campground	11	17	41	59
	12	23	78	22
Tioga Dam and Auxiliary Dam	13	10	60	40
	14	74	69	31

Botanical Resources Study Area Location	Population	Number of Individuals	Percent Vegetative	Percent Flowering/Fruiting
Tioga Lake Campground	15	6	17	83
	16	9	55	45
	17	13	85	15
Saddlebag Dam and Campgrounds	7	30	85	15
	8	200	75	25
	18	16	80	20
	19	1	100	0
	20	30	80	20
	21	14	80	20
	22	1	100	0
	23	1	100	0
	24	2	100	0

6.9.1.3. Threatened and Endangered Terrestrial Wildlife

This section describes terrestrial wildlife species listed as threatened or endangered with potential to occur in the Project Vicinity.

Four threatened or endangered wildlife species or their sign (e.g., by scat, footprints, burrows) were observed during the 2022 and 2023 TERR-2 Studies: Yosemite toad, bald eagle (*Haliaeetus leucocephalus*), golden eagle (*Aquila chrysaetos*), and Sierra Nevada bighorn sheep (*Ovis canadensis sierrae*). These species are listed in Table 6.9-2.

Of these four species, two have designated critical habitat within or directly adjacent to the FERC Project Boundary: Yosemite toad and Sierra Nevada bighorn sheep.

YOSEMITE TOAD

Yosemite toad is a federally threatened species and is known to occur adjacent to the FERC Project Boundary. Yosemite toads typically inhabit high elevation wet meadows and lakeshores surrounded by forests or shrublands. Focused Yosemite toad surveys were conducted concurrently with the TERR-2 Studies in 2022 and 2023. The surveys documented Yosemite toad breeding outside, but immediately adjacent to, the FERC Project Boundary. The observed breeding location are specifically located along the southern boundary of Tioga Lake, west of the confluence of Lee Vining Creek and Slate Creek and south of Saddlebag Lake. Detailed results of the Yosemite toad surveys are included in the TERR-2 Final Technical Report, which is included in Volume III of this DLA.

BALD AND GOLDEN EAGLE

Both bald and golden eagles are protected under the federal BGEPA, and both are California fully protected species. Only the bald eagle is listed as endangered under the California ESA, but both species are considered RTE species. Both species were observed flying across the FERC Project Boundary during the surveys; however, no nesting by either species was observed.

SIERRA NEVADA BIGHORN SHEEP

The Sierra Nevada bighorn sheep is both a federally and state endangered species. The distribution of bighorn sheep is determined by topography, visibility, water availability, and forage quality and quantity. Typical Sierra Nevada bighorn sheep terrain is rough, rocky, and steep. It also encompasses alpine meadows, summit plateaus, and meadows fed by springs within escape terrain. In its range, they tend to prefer open uncluttered areas where they can use their keen eyesight to detect and avoid predators, such as mountain lion (CDFW, 2024).

The Project Area occurs at the boundary of two established herds: the Warren Mountain Herd is north of Tioga Pass, and the Gibb Mountain Herd is south of Tioga Pass (CDFW, 2024). Sheep scat was observed approximately 100 feet east of Tioga Lake during the pedestrian portion of the wildlife surveys. Evidence of sheep (such as scat) was expected to be observed during the survey.

Table 6.9-2. Threatened and Endangered Wildlife Species Observed in TERR-2 Studies

Scientific Name	Common Name	Habitat	Status [a]	Saddlebag Lake	Tioga Lake	Wildlife Study Area Between Reservoirs
Anaxyrus canorus	Yosemite toad	Primarily montane wet meadows; also in seasonal ponds associated with lodgepole pine (*Pinus contorta*) and subalpine conifer forest within meadow and seep, subalpine coniferous forest, and wetland habitat, from 6,400 to 11,300 feet (Brown et al., 2015; CDFW, 2020b).	FT, SSC	X	X	X
Haliaeetus leucocephalus	Bald eagle	Nesting and wintering habitat includes ocean shores, lakes, and river margins. Nests usually within 1 mile of water. Not found in the High Sierra Nevada. Nests in large old growth trees, especially tall snags. Requires large bodies of water, or free flowing rivers with abundant fish. Roosts communally in winter in dense, sheltered, and remote conifer stands. Forested stands with large, old dominant or co-dominant trees in the vicinity of lakes, reservoirs, rivers, or large streams that support an adequate food supply (USFS, 2001).	SE, FP	X	X	
Aquila chrysaetos	Golden eagle	Occur locally in open country such as open coniferous forest, sage-juniper flats, desert, and barren areas, especially in rolling foothills and mountainous regions. Within Southern California, species favors grasslands, brushlands, deserts, oak savannas, open coniferous forests, and montane valleys. Nesting is primarily restricted to rugged, mountainous country. Cliff-walled canyons provide nesting habitat in most parts of range; also, large trees in open areas.	FP	X		

Scientific Name	Common Name	Habitat	Status [a]	Saddlebag Lake	Tioga Lake	Wildlife Study Area Between Reservoirs
Ovis canadensis sierrae	Sierra Nevada bighorn sheep	Alpine and subalpine zones, with open slopes where the land is rocky, sparsely vegetated, and characterized by steep slopes and canyons. Available water and steep, open terrain free of competition from other grazing ungulates within alpine, alpine dwarf scrub, chaparral, chenopod scrub, Great Basin scrub, Mojavean desert scrub, montane dwarf scrub, pinon and juniper woodlands, riparian woodland, and Sonoran desert scrub habitats, from 5,000 to 9,000 feet amsl during the winter and 10,000 to 14,000 feet amsl during summer (Inyo National Forest, 2019; CDFW, 2020b; USFWS, 2007).	FE, SE, FP		X	X

Source: CDFW, 2023a
amsl = above mean sea level; CDFW = California Department of Fish and Wildlife; USFWS = U.S. Fish and Wildlife Service
[a] Federal (USFWS)
FE = Federally Endangered
FT = Federally Threatened

State (CDFW)
SE = State Endangered
FP = Fully Protected
SSC = Species of Special Concern

A literature review was performed to identify threatened and endangered wildlife species and their habitats known to occur or potentially occur in the FERC Project Boundary. None of these species were observed during wildlife or aquatic species surveys. Despite not being observed during the surveys, five threatened or endangered wildlife species may traverse or otherwise occur in the FERC Project Boundary over the course of the proposed license. All five species have a low likelihood of occurring. Nine additional threatened or endangered wildlife species were identified as having no potential to occur. These 14 threatened and endangered species identified in the literature search are listed in Table 6.9-3.

Table 6.9-3. Threatened and Endangered Species Identified in Literature Search

Scientific Name	Common Name	Habitat	Status [a]	Potential To Occur/Notes
May Occur (Low Likelihood)				
Rana sierrae	Sierra Nevada yellow-legged frog	Encountered within a few feet of water. Tadpoles may require 2 to 4 years to complete their aquatic development. Found in streams, lakes, and ponds in montane riparian and a variety of other habitats from 4,495 to 11,975 feet amsl. Ranges throughout the northern Sierra Nevada in high elevation, deep lakes (Sierra Nevada between north end of Mt. Whitney Ranger District to north end of Mono Lake Ranger District) (Brown et al., 2014; Inyo National Forest, 2019; CDFW, 2020b).	FE, ST	May occur (low likelihood); previously outside of species range, however, recently reintroduced by CDFW into Maul Lake approximately 0.75 mile southwest of the FERC Project Boundary and approximately 500 feet higher in elevation than the closest portion of the FERC Project Boundary. [b] Project has no hydrologic influence on the reintroduction location, and the proposed license activities would not conflict with the reintroduction efforts. Further, habitat within the FERC Project Boundary is not expected to be suitable for the species due to the presumed presence of non-native fish.
Vulpes vulpes necator	Sierra Nevada red fox	Uses dense vegetation and rocky areas for cover and den sites. Found in a variety of habitats, including alpine, alpine dwarf scrub, broadleaved upland forest, meadow and seep, riparian scrub, subalpine coniferous forest, upper montane coniferous forest, and wetland; at elevations above 2,500 feet amsl. Forested areas (red fir and lodgepole pine) and subalpine and alpine habitats in proximity to meadows, riparian areas, and brush fields above 5,000 feet amsl (USFS, 2001). Limited occurrence information on Mammoth Ranger District but known to occur on	FCE, ST	May occur (low likelihood); within current known range but no recent observations.

Scientific Name	Common Name	Habitat	Status [a]	Potential To Occur/Notes
		adjacent national forests (Inyo National Forest, 2019).		
Pekania pennanti [Martes pennanti pacifica]	Fisher, West Coast distinct population segment	Forest or woodland landscape mosaics that include late-successional conifer-dominated stands. 6,500 to 10,000 feet amsl. High canopy cover needed (USFWS, 2016; Zielinski et al., 2004).	FE[c], ST	May occur (low likelihood); within current known range but no recent observations.
Gulo gulo	California wolverine	Found in a wide variety of high elevation habitats, including alpine, meadow and seep, north coast coniferous forest, riparian forest, subalpine coniferous forest, upper montane coniferous forest, and wetland from 1,640 to 4,921 feet amsl. Needs water source. Uses caves, logs, burrows for cover and den area. Hunts in more open areas. Can travel long distances. Needs water source. Uses caves, logs, burrows for cover and den area. Hunts in more open areas. Can travel long distances (USFS, 2001).	FCT, ST, FP	May occur (low likelihood); no observations for 100 years until 2023 when observed in both Yosemite National Park and Mono County, CA (CDFW, 2023b).

Scientific Name	Common Name	Habitat	Status [a]	Potential To Occur/Notes
No Potential to Occur				
Cyprinodon radiosus	Owens pupfish	Once inhabited a wide variety of shallow-water habitats in the Owens Valley, including spring fed pools, sloughs, irrigation ditches, swamps, and flooded pastures.	FE	No potential to occur; not observed during surveys conducted in 1986, 1987, 1999–2001, 2006, 2011, and 2016 in Lee Vining Creek between Saddlebag Dam and the confluence with Slate Creek (Salamunovich, 2017; FERC, 1992). Established populations occur only in special refuges in the Owens Valley (Moyle, 2002).
Siphateles bicolor snyderi	Owens tui chub	Characteristic habitat includes calm water with aquatic plant beds and sandy or fine substrate (Moyle, 2002). Where are abundant, water temperatures are typically over 20°C and alkaline (Moyle, 2002).	FE	No potential to occur; not observed during surveys conducted in 1986, 1987, 1999–2001, 2006, 2011, and 2016 in Lee Vining Creek between Saddlebag Dam and the confluence with Slate Creek (Salamunovich, 2017; FERC, 1992).
Oncorhynchus clarkii seleniris	Paiute cutthroat trout	Associated with habitats similar to other western stream-inhabiting trout, which include cool, well-oxygenated streams, pools, undercut or overhanging banks, and abundant riparian cover (Moyle, 2002).	FT	No potential to occur; not observed during surveys conducted in 1986, 1987, 1999–2001, 2006, 2011, and 2016 in Lee Vining Creek between Saddlebag Dam and the confluence with Slate Creek (Salamunovich, 2017; FERC, 1992). Closest known occurrence to the Project is from 1974 in Delaney Creek, which is a tributary to the Tuolumne River in Yosemite National Park located about 4.5 miles from the Project across the Sierra Nevada crest from the Project watershed (CDFW, 2020b).

Scientific Name	Common Name	Habitat	Status [a]	Potential To Occur/Notes
Oncorhynchus clarkii henshawi	Lahontan cutthroat trout	Occur in stream habitats characterized by cool, flowing water, available riparian cover, stable stream banks, water velocity breaks, and silt-free, rocky riffle-run areas, as well as large alkaline lakes (e.g., Pyramid Lake, Nevada) and alpine lakes (e.g., Lake Tahoe, California; 73 *Federal Register* 175 [September 9, 2008]).	FT	No potential to occur; not observed during surveys conducted in 1986, 1987, 1999–2001, 2006, 2011, and 2016 in Lee Vining Creek between Saddlebag Dam and the confluence with Slate Creek (Salamunovich, 2017; FERC, 1992).
Anaxyrus exsul	Black toad	Extremely limited range in Deep Springs Valley area (Inyo National Forest, 2019). Associated with springs and adjacent riparian vegetation (CDFW, 2020b).	SCC, ST, FP	No potential to occur; outside of range.
Rana muscosa	Mountain yellow-legged frog, northern distinct population segment	High elevation lakes and wet meadow systems. On the Inyo National Forest, only occurs on the Mt. Whitney Ranger District (Inyo National Forest, 2019). Highly aquatic and rarely found more than 3.3 feet from water. Can be found sitting on rocks along the shoreline where there may be little or no vegetation. Historically inhabited lakes, ponds, marshes, meadows, and streams at elevations typically ranging from approximately 4,500 to 12,000 feet amsl (USFWS, 2014; CDFW, 2020b).	FE, SE	No potential to occur; outside of range.

Scientific Name	Common Name	Habitat	Status [a]	Potential To Occur/Notes
Buteo swainsoni	Swainson's hawk	Breeds in grasslands with scattered trees, juniper-sage flats, riparian areas, savannahs, and agricultural or ranch lands with groves or lines of trees. Requires adjacent suitable foraging areas such as grasslands, or alfalfa or grain fields supporting rodent populations.	BCC, ST	No potential to occur for nesting; may occur as migrant, but outside of breeding range.
Strix nebulosa	Great gray owl	Mixed coniferous forest where such forests occur in combination with large meadows or other vegetated openings between 2,400 to 7,500 feet amsl. With migration outside of breeding elevation up to 9,000 feet amsl.	SCC, SE	No potential to occur for nesting; may occur as migrant, but outside of breeding range.
Empidonax traillii	Willow flycatcher	In general, prefers moist, shrubby areas, often with standing or running water; in California, restricted to thickets of willows, whether along streams in broad valleys, in canyon bottoms, around mountain-side seepages, or at the margins of ponds and lakes. In the west, generally occurs in beaver meadows, along borders of clearings, in brushy lowlands, in mountain parks, or along watercourses to 7,500 feet amsl. Meadows greater than 15 acres in size with water present and a woody riparian shrub component greater than 6.5 feet in height.	SCC, BCC, SE	No potential to occur; no suitable nesting habitat present within the FERC Project Boundary.

Scientific Name	Common Name	Habitat	Status [a]	Potential To Occur/Notes
Ovis canadensis nelsoni	Nelson desert bighorn sheep	White Mountain area at elevations ranging from 6,000 to 12,000 feet amsl. Most of these animals occur in the White Mountain Wilderness, with approximately 10% of the population occurring outside this area in Silver Canyon (Inyo National Forest, 2019; USFWS, 2007).	SCC, FP	No potential to occur; outside of range.

°C = degrees Celsius; amsl = above mean sea level; CDFW = California Department of Fish and Wildlife; ESA = Endangered Species Act; FERC = Federal Energy Regulatory Commission; USFWS = U.S. Fish and Wildlife Service

[a] Federal (USFWS)
FE = Federally Endangered
FT = Federally Threatened
BCC = Bird of Conservation Concern
FCE = Candidate as Federally Endangered
FCT = Candidate as Federally Threatened
SCC = Species of Conservation Concern

State (CDFW)
FP = Fully Protected
SE = State Endangered
ST = State Threatened

[b] The species is known to be absent from the FERC Project Boundary and connected tributaries; however, the CDFW recently reintroduced the species into Maul Lake (personal communication, James Erdman, California Department of Fish and Game, February 25, 2021).
[c] This species was listed as endangered under the federal ESA on May 15, 2020 (85 *Federal Register* 95 [May 15, 2020]).

6.9.1.4. Biological Opinions, Status Reports, or Recovery Plans Pertaining to Listed Species

The USFWS released the southwestern willow flycatcher recovery plan in 2002 (Finch et al., 2002), the Sierra Nevada bighorn sheep recovery plan in 2007 (USFWS, 2007), the *Revised Recovery Plan for the Paiute Cutthroat Trout* (*Oncorhynchus clarkii seleniris*) in 2024 (USFWS, 2004), and the *Species Status Assessment Report for the Whitebark Pine* in 2021 (USFWS, 2021). A proposed rule was released in September 2023 by USFWS to develop a species status assessment for the fisher (88 *Federal Register* 185 [September 26, 2023]); additionally, the USFWS proposed critical habitat for the southern Sierra Nevada distinct population segment of fisher in November 2022 (87 *Federal Register* 214 [November 7, 2022]). The Owens Tui chub (*Siphateles bicolor snyderi*) is one of several species included in the 1998 Owens Basin wetland and aquatic species recovery plan (USFWS, 1998). The USFS released the *Yosemite Toad Conservation Assessment* in 2015 (Brown et al., 2015). Based on the wildlife study performed for this relicensing and a review of SCE's proposed operations under the new license, relicensing and operation of the Project as proposed by SCE is consistent with the status reports' recommended conservation measures.

In 2014, the USFWS released a programmatic biological opinion for nine national forests for the Sierra Nevada yellow-legged frog (*Rana sierrae*), mountain yellow-legged frog (*Rana muscosa*), and Yosemite toad (USFWS, 2014). Based on the wildlife study performed for this relicensing and a review of SCE's proposed operations under the new license, relicensing and operation of the Project as proposed by SCE is consistent with the recommended measures on the 2014 biological opinion to avoid effects on Yosemite toad populations surrounding the FERC Project Boundary or adjacent populations along Lee Vining Creek.

In 2017, the USFWS (USFWS, 2017) released an amendment to the 2014 biological opinion at the request of the USFS because critical habitat for the three listed amphibians was not designated at the time of issuance of the original biological opinion on December 19, 2014. Critical habitat was designated on August 26, 2016, and USFS requested reinitiation of the programmatic biological opinion to analyze effects of the Proposed Action on critical habitat for these three species. This biological opinion is issued under the authority of the federal ESA, as amended (16 USC § 1531 et seq.).

6.9.1.5. Critical Habitat

On August 26, 2016, the USFWS published the current Final Rule designating 750,926 acres of land as critical habitat for the Yosemite toad and 1,082,147 acres of land as critical habitat for the Sierra Nevada yellow-legged frog in Alpine, Amador, Calaveras, El Dorado, Fresno, Inyo, Lassen, Madera, Mariposa, Mono, Nevada, Placer, Plumas, Sierra, Tulare, and Tuolumne Counties, California (81 *Federal Register* 166 [August 26, 2016]). On August 5, 2008, the USFWS published the current Final Rule designating approximately 417,577 acres of land as critical habitat for the Sierra Nevada bighorn sheep in Tuolumne, Mono, Fresno, Inyo, and Tulare Counties, California (73 *Federal Register* 151 [August 5, 2008]).

The USFWS made a determination to list whitebark pine as threatened under the federal ESA but not list critical habitat for the species in December 2022 (87 *Federal Register* 240 [December 15, 2022]). The USFWS determined that habitat loss is not a threat to the continued survival of the species; mortality from disease from non-native white pine blister rust is the primary threat.

The FERC Project Boundary from Saddlebag Lake to just below Ellery Lake occurs within areas mapped as critical habitat for both Yosemite toad (Unit 5) and Sierra Nevada yellow-legged frog (Subunit 2M) (approximately 586 acres and 574 acres, respectively). Of the 417,577 acres of designated critical habitat, a very small portion (less than 1 acre), lies within the FERC Project Boundary. Figure 6.9-2 illustrates the location of the FERC Project Boundary with respect to the three species' critical habitat areas.

The USFWS proposed critical habitat for the southern Sierra Nevada distinct population segment of fisher in November 2022 (87 *Federal Register* 214 [November 7, 2022]); however, the proposed critical habitat is not located within the FERC Project Boundary or in Mono County.

The USFWS has not designated any critical habitat for any fish species within the Project Vicinity.

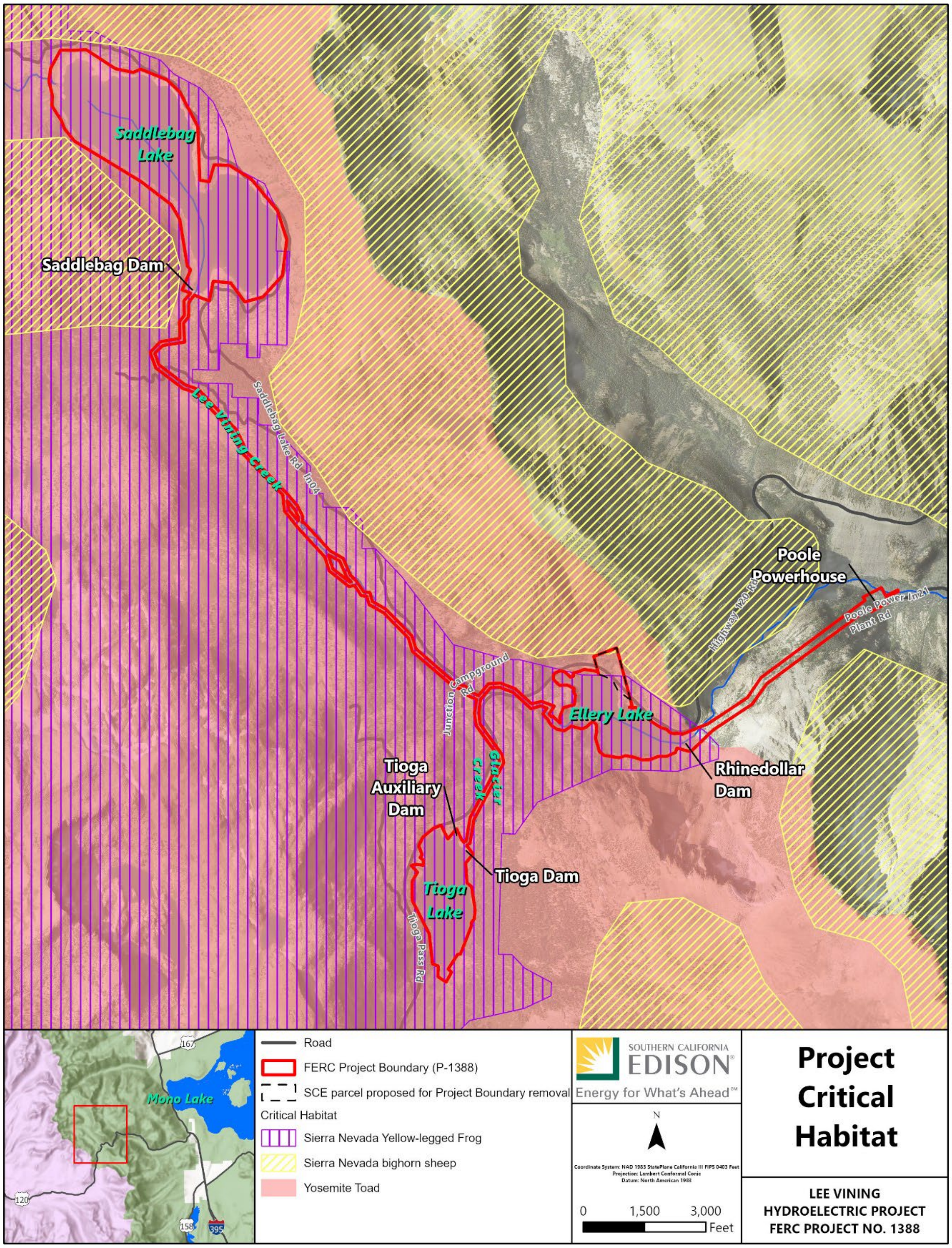


Figure 6.9-2. Critical Habitat Areas in Relation to the Existing FERC Project Boundary.

6.9.2. Potential Adverse Effects and Issues

6.9.2.1. Effects of Project Operations and Maintenance on Rare, Threatened, and Endangered Plant Resources Within the Project Area

Whitebark pine is listed as threatened under the federal ESA and is designated as SCC by the Inyo National Forest. During 2022 and 2023 surveys, whitebark pine was observed in the vicinity of the following Project facilities: Saddlebag Dam and spillway (the upland areas below and west of the dam, spillway, and valve house and adjacent to access roads); Rhinedollar Dam (below the dam and along the penstock alignment); and Tioga Dam and Tioga Auxiliary Dam (in upland areas below Tioga Dam and in the uplands below the auxiliary dam).

No Action

Under the No Action, SCE would continue to operate and maintain the Project in accordance with the terms and conditions of the FERC license. No adverse effects on RTE plant species as a result of Project O&M have been identified, relative to baseline conditions.

The Project, as currently operated, does not interfere with the ecological conditions that allow for the persistence of RTE plant species and has no adverse effect on the spatial distribution of existing whitebark pine present in the area surrounding the Project.

Proposed Action

Based on the analysis discussed above, the results of the TERR studies, and because the Proposed Action does not include changes to O&M activities, no adverse effects have been identified for Proposed Action.

Adjustment of the existing FERC Project Boundary would include areas currently being used for O&M activities but not previously included in the boundary. No new adverse effects are anticipated as all of the newly incorporated areas have been subject to ongoing disturbance.

Maintenance activities are anticipated to be located in developed areas and are not anticipated to have effects on RTE plant species.

6.9.2.2. Effects of Project Operations and Maintenance Activities on Threatened and Endangered Terrestrial Wildlife Resources

Terrestrial habitat in the Project Area is widespread and generally consists of the upland vegetation types within and surrounding the FERC Project Boundary. Yosemite toad, a federally listed threatened wildlife species, and Sierra Nevada bighorn sheep, a federally and state-listed endangered wildlife species, are both known to use terrestrial habitat within the Project Area. Bald and golden eagle, both wildlife species protected under the federal BGEPA, were also observed in the FERC Project Boundary during the terrestrial wildlife surveys; however, the individuals observed were transitory and not using the Project Area or Vicinity for breeding activities.

Maintenance of Project facilities occurs on SCE property within previously disturbed and maintained areas, such as the areas surrounding valve houses and gaging stations. Under the new license, SCE proposes a slight modification of the existing FERC Project Boundary. Expansion of the FERC Project Boundary would include areas currently being used for O&M activities but not previously included in the existing boundary. Although the size of the Project-affected area within the proposed FERC Project Boundary would technically increase, no new effects from the Project on the surrounding areas would occur because all the newly incorporated areas have been subject to ongoing maintenance activities and are mostly previously disturbed areas.

NO ACTION

Under the No Action, SCE would continue to operate and maintain the Project in accordance with the terms and conditions of the FERC license. No effects on RTE wildlife species or their associated habitat were identified, relative to baseline conditions.

The Project, as currently operated, does not interfere with the ecological conditions that allow for the persistence of threatened and endangered wildlife species or at-risk species.

PROPOSED ACTION

Based on the analysis discussed above, the results of the TERR studies, and because the Proposed Action does not include changes to O&M activities, no adverse effects have been identified for Proposed Action.

Adjustment of the existing FERC Project Boundary would include areas currently being used for O&M activities but not previously included in the boundary. No new adverse effects are anticipated as all of the newly incorporated areas have been subject to ongoing disturbance.

Maintenance activities are anticipated to be located in developed areas and are not anticipated to have effects on threatened or endangered terrestrial wildlife species.

Under the new license, continued Project operations are not anticipated to affect threatened or endangered terrestrial wildlife species.

Therefore, there would be no adverse effects on threatened or endangered terrestrial wildlife species under the Proposed Action.

6.9.2.3. Effects of Dispersed-Use Recreational Activities on Yosemite Toad and Habitat

Recreation is not part of SCE's routine O&M as no recreation facilities are associated with the FERC license. As such, SCE has no control over public use of the Project Area. Dispersed-use recreational activities (activities not contained to one area specifically developed for the activity) within the FERC Project Boundary include hiking, fishing, and mountain biking. These activities most commonly coincide with the edge of waterlines, (i.e., along the shorelines of Tioga and Saddlebag Lakes). Trampling of Yosemite toad juveniles and associated breeding habitat may occur as a result of these activities.

There are three locations of concern for Yosemite toad and dispersed recreation:

- The first location is at the south end of Saddlebag Lake. The trail used most often by hikers and other recreationalists circumvents the wet meadow known to support Yosemite toad. However, recreationalists can stray from the trail into the wet meadow, potentially harming individual Yosemite toads.
- The second Yosemite toad location along Lee Vining Creek is in an area that shows evidence of frequent use by dispersed recreationalists.
- The third Yosemite toad location along the shoreline of Tioga Lake intersects a trail regularly used by dispersed recreationalists. Recreationalists using this trail may have the potential to harm individual Yosemite toads.

Neither the existing Project nor the Proposed Action involve any recreational elements, but some of the Project facilities are used as resources for recreating (i.e., fishing within the Project waterbodies), and the Project occurs within a recreational corridor: the Project is located between a major state highway and nationally designated wilderness areas and is located adjacent to Yosemite National Park.

NO ACTION

Under the No Action, SCE would continue to operate and maintain the Project in accordance with the terms and conditions of the FERC license. Potential effects associated with recreational activities in the Project Area would not change, relative to baseline conditions. Subsequently, current dispersed-use recreational activity will continue to have potential to affect Yosemite toad and their associated habitat.

PROPOSED ACTION

Based on the analysis discussed above, the results of the TERR studies, and because the Proposed Action does not include changes to O&M activities, no adverse effects have been identified for the Proposed Action.

Adjustment of the existing FERC Project Boundary would include areas currently being used for O&M activities but not previously included in the boundary. No new adverse effects are anticipated as all of the newly incorporated areas have been subject to ongoing disturbance. No new recreational responsibilities are included in the Proposed Action or Project Boundary adjustment, therefore, no new effects to RTE species are anticipated.

The Project, as currently operated, does not interfere with the ecological conditions that allow for the persistence of threatened and endangered wildlife species or at-risk species, and current Project O&M activities do not interfere with the Inyo National Forest LMP conditions to manage the landscape for at-risk species or provide for the recovery of threatened and endangered species.

6.9.2.4. Effects of Project Operations and Maintenance Activities on Bighorn Sheep and Habitat

A portion of the existing FERC Project Boundary (less than 1 acre) occurs within federally designated bighorn sheep critical habitat. Evidence of bighorn sheep was observed during the technical studies, but no individuals were observed. Bighorn sheep herds have large ranges that include both the Project Area and adjacent lands. Their designated critical habitat consists of 417,577 acres.

NO ACTION

Under the No Action there will be no change in operations or maintenance from baseline conditions. Bighorn sheep currently use the Project Area as a small part of their large range. Designated critical habitat for the bighorn sheep overlaps a small part of the Project Area, and the continuation of current Project O&M activities would not have an adverse effect on designated critical habitat for the bighorn sheep.

PROPOSED ACTION

Under the Proposed Action, less than 1 acre of designated critical habitat for the bighorn sheep will be removed from the FERC Project Boundary. This area is owned and managed by SCE and is not currently used for O&M activities; with no other changes to O&M activities or land use patterns, removing it from the FERC Project Boundary would not have an adverse effect on bighorn sheep or their designated critical habitat.

No changes in Project operations are proposed as part of the Proposed Action; therefore, no adverse effects on bighorn sheep or their habitat are anticipated from continued operations.

Adjustment of the existing FERC Project Boundary would include areas currently being used for O&M activities but not previously included in the boundary. No new adverse effects are anticipated as all of the newly incorporated areas have been subject to ongoing disturbance.

Maintenance activities are anticipated to be located in developed areas and are not anticipated to have effects on bighorn sheep or their habitat.

6.9.2.5. Consistency with Current Resource Management Objectives (Forest Plans, Basin Plan, etc.)

Chapter 2 of the 2019 Inyo National Forest LMP (USFS, 2019) describes forest-wide conditions and management direction for wildlife resources. This direction applies across all lands of the Inyo National Forest, including desired conditions, objectives, goals, standards, guidelines, and potential management approaches. Using the results obtained from Project technical reports, SCE assessed RTE species and associated habitat against the desired future conditions stated in Chapter 2.

Current Project O&M activities, which will continue to be implemented under the Proposed Action, do not interfere with the Inyo National Forest LMP (USFS, 2019) conditions to manage the landscape for at-risk species or provide for the recovery of threatened and endangered species.

Desired conditions for RTE resources, with which the Project is consistent, include the following:

- SPEC-FW-DC 02: Habitats for at-risk species support self-sustaining populations within the inherent capabilities of the plan area. Ecological conditions provide habitat conditions that contribute to the survival, recovery, and delisting of species under the federal ESA; preclude the need for listing new species; improve conditions for SCC including addressing threats (e.g., minimal impacts from disease); and sustain both common and uncommon native species.

- SPEC-FW-DC 03: Land management activities are designed to maintain or enhance self-sustaining populations of at-risk species within the inherent capabilities of the plan area by considering the relationship of threats (including site-specific threats) and activities to species survival and reproduction.

- SPEC-FW-DC 05: The Inyo National Forest provides high quality hunting and fishing opportunities. Habitat for non-native fish and game species is managed in locations and ways that do not pose substantial risk to native species while still contributing to economies of local communities.

- SPEC-FW-DC 06: Residents and visitors have ample opportunities to experience, appreciate, and learn about the Inyo National Forest's wildlife, fish, and plant resources.

- SPEC-SHP-DC 01: An adequate amount of suitable habitat supports persistent populations of bighorn sheep. These habitat patches include unforested openings supporting productive plant communities with a variety of forage species in and near adequate steep rocky escape terrain throughout the elevational range of mountain ranges. These areas meet different seasonal needs for each sex for feeding, night beds, birthing sites, lamb rearing, and migration routes between suitable habitat patches.

- TERR-ALPN-DC 04: Mature cone-bearing whitebark pine trees are spatially well distributed to produce and protect natural regeneration and conserve genetic diversity.

- TERR-FW-DC 05: Ecological conditions contribute to the recovery of threatened and endangered species, conserve proposed and candidate species, and support the persistence of SCC.

The Project is managed in a way consistent with these desired conditions, and no changes that would affect these conditions are currently proposed to Project O&M activities.

The Project, as described under the license application, proposes minor changes to the FERC Project Boundary but no changes in O&M. Therefore, the Project would not affect the current habitat (soils, vegetation, or movement and connectivity for wildlife) or have an effect on habitats that support at-risk species or species listed under the federal and California ESAs.

The Project would not affect the current availability of dispersed recreational opportunities or have an adverse effect on the current terrestrial wildlife resources. Further, the Proposed Action as described would not affect visitors' ability to appreciate the Project Area.

No changes that would affect the conditions associated with an adequate amount of bighorn sheep habitat are currently proposed under Project O&M activities.

6.9.2.6. Proposed Protection, Mitigation, and Enhancement Measures

As no adverse effects are anticipated, SCE is not proposing specific PME measures for RTE species; however, protection and avoidance measures for RTE resources are described in the Project Resource Management Plan (PME-4) (Attachment 1 to Appendix E.1, *Protection, Mitigation, and Enhancement Measures*).

6.10. RECREATION

This section describes the recreation resources in the Project Vicinity. There are no recreation facilities within the FERC Project Boundary. The discussion is intended to provide background for evaluating potential issues relating to the Proposed Action and how the recreation studies inform the understanding of Project effects. The *Existing Recreation Facilities Condition Assessment REC-2 Final Technical Report* is included with this DLA in Volume III. A Recreation Use Assessment (REC-1) is being conducted through October 2024; results of that study and the REC-1 Draft Technical Report will be included with the FLA.

Wild and scenic rivers and scenic highways/byways are discussed in Section 6.12, *Aesthetic Resources*.

6.10.1. AFFECTED ENVIRONMENT

The Project is located on Lee Vining and Glacier Creeks in the glacially carved upper Lee Vining Canyon, approximately 9 miles upstream of Mono Lake and the town of Lee Vining, California, and less than 1 mile north of the eastern entrance to Yosemite National Park. The recreation season is tied to the availability of Tioga Pass, which on average is only open from April to November, though these dates are highly dependent on snowpack and plowing for that year (NPS, 2023).

The Project is located in the northernmost part of the Inyo National Forest, which stretches 165 miles north to south along the eastern Sierra Nevada, featuring over 2 million acres of pristine lakes, winding streams, rugged peaks, and arid Great Basin Mountains (USFS, 2020a). The Inyo National Forest features some of the world's oldest trees in the Ancient Bristlecone Pine Forest in the White Mountains that mark the eastern boundary of Owens Valley, glaciers along the Sierra Nevada crest, and an elevation range from the tallest peak in the lower 48 states (Mount Whitney at elevation 14,494 feet) to semiarid deserts and valleys at elevation 3,900 feet.

The Inyo National Forest also contains nine congressionally designated wilderness areas: Hoover, Ansel Adams, John Muir, Golden Trout, Inyo Mountains, Boundary Peak, South Sierra, White Mountain, and Owens River Headwaters. Devils Postpile National Monument, administered by the National Park Service, is within the Inyo National Forest in the Reds Meadow area west of Mammoth Lakes.

6.10.1.1. Recreation in the Project Area

The current Project license does not include recreational facilities or any related resource management plan. An overview of non-Project, Inyo National Forest recreation sites that are available for public use within the Project Vicinity was provided in the PAD (SCE, 2021)

CAMPING AND DAY-USE AREAS

The Mono Lake Ranger District of the Inyo National Forest operates and maintains recreational facilities and opportunities within upper Lee Vining Canyon, providing approximately 6 public campgrounds with 79 camping units in the upper canyon, one of which is a group unit accommodating up to 25 guests, as summarized in Table 6.10-1 (USFS, 2020b). Other developed recreation sites include Saddlebag Day Use Area, Tioga Lake Overlook information site, and eight trailheads that will be discussed in a later section. These sites range in elevation from 10,000 feet at Saddlebag Lake to 9,500 feet at Ellery Lake Campground. The majority of these sites are adjacent to Project water features (Saddlebag Lake, Tioga Lake, Ellery Lake, Glacier Creek, and Lee Vining Creek), Saddlebag Lake Road, and State Route 120 (also called Tioga Pass Road).

Table 6.10-1. Inyo National Forest Camping Facilities in Upper Lee Vining Canyon (Listed Generally Upstream to Downstream)

Name	Amenities	Number of Sites	Open	Elevation (feet)
Saddlebag Lake Campground	B/v/RV	19	July–Sep	10,000
Saddlebag Lake Trailhead Group Campground	B/R/v	1 (accommodates 25 people)	July–Sep	10,000
Sawmill Walk-in Campground	No RVs or trailers/B/v	12	July–Sep	9,800
Junction Campground	B/v	13	July–Oct	9,600
Tioga Lake Campground	B/v/RV	13	July–Sep	9,700
Ellery Lake Campground	B/v	21	July–Oct	9,500

Source: USFS, 2020b

B = bear boxes; R = reservations;RV = small recreational vehicles or short trailers only, no RV hook up; v = vault restroom

Per USFS data, the occupancy rates at the upper Lee Vining Canyon campgrounds were generally less in 2022 than in 2021 (Table 6.10-2). Campgrounds were open for a limited season in summer 2023 due to the heavy snowfall the previous winter. The two resorts in the area, Saddlebag Lake Resort and Tioga Pass Resort, did not operate in 2023.

Table 6.10-2. Upper Lee Vining Canyon Area Campground Occupancy Rates in 2021 and 2022

Campground	Occupancy Rate (%)	
	2021	2022
Saddlebag Lake Campground	81	69
Saddlebag Lake Trailhead Group Campground	76	59
Tioga Lake Campground	88	89
Ellery Lake Campground	92	85
Junction Campground	85	84
Sawmill Walk-in Campground	52	46

Source: Personal communication, Adam Barnett, USFS, June 26, 2024

HIKING

Approximately 17 miles of trails (2.9 miles minimally developed, 3.4 miles moderately developed, 10.2 miles developed, and 0.5 mile fully developed) and 8 developed trailheads are maintained by the Inyo National Forest in the upper Lee Vining Canyon (Figure 6.10-1), many of which are adjacent to the FERC Project Boundary (USFS, 2018a). Many of these trails provide access for lake, pond, or river fishing; or access that leads to backpacking opportunities in the Hoover and Ansel Adams Wildernesses.

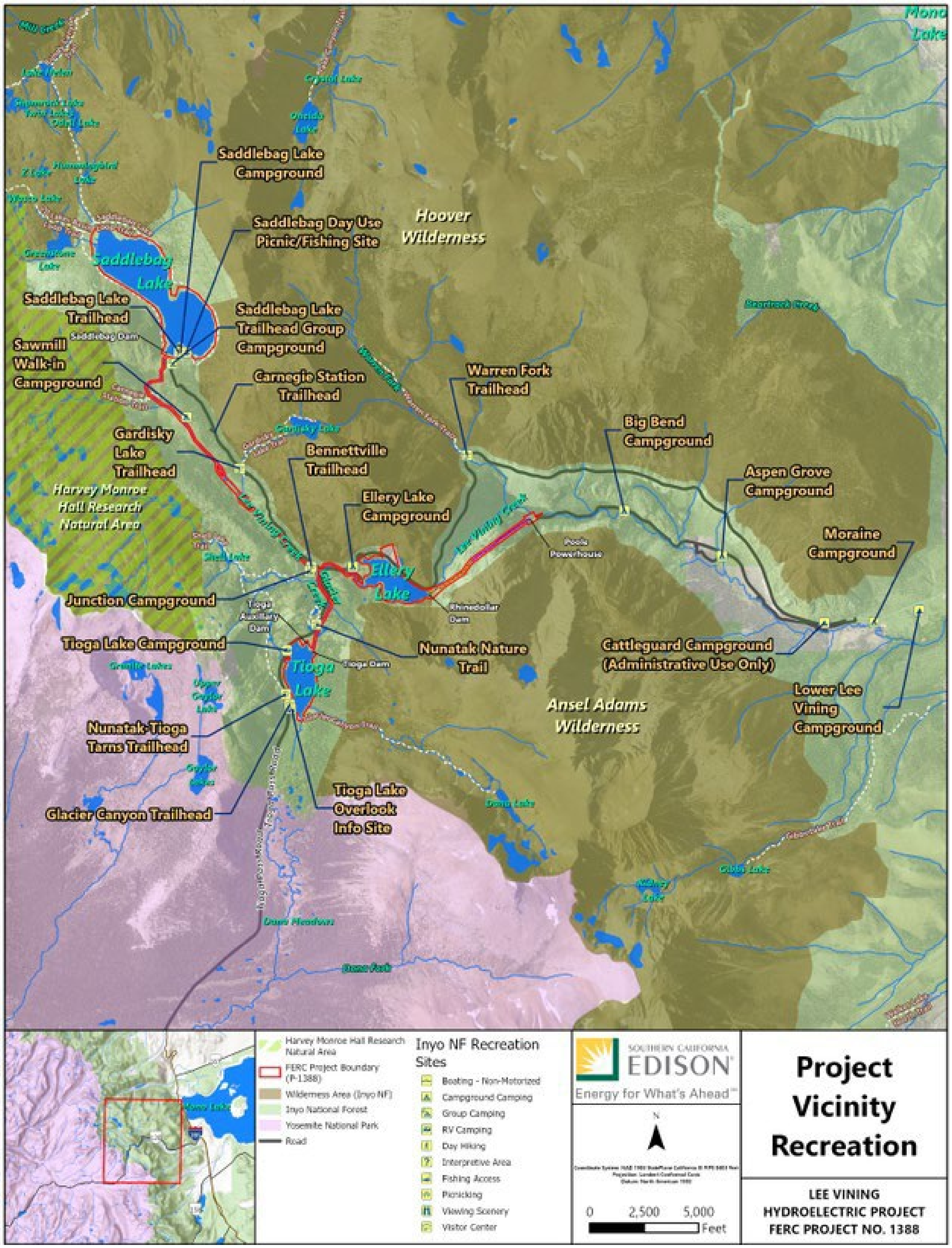


Figure 6.10-1. Recreation Opportunities in the Project Vicinity.

Overnight wilderness permits are available for overnight backpacking originating from the Inyo National Forest's Saddlebag Lake and Glacier Canyon Trailheads, which provide access to the Hoover and Ansel Adams Wildernesses, respectively. Inyo National Forest maintains records by entry date, entry trailhead, and number of hikers (often capped by quota per day). Permit records over the last several years indicate approximately 130 users per week over the collection period. In 2020, the weekly average was 132 users. Usage generally peaks during the summer between Independence Day and Labor Day weekends. While many of the hikes originating from trailheads in the Lee Vining Canyon are loops or long-distance hikes that will have hikers exit where they entered, use numbers do not account for hikers originating at a trailhead outside of, but ending within, the Lee Vining Canyon.

Overnight wilderness permit data does not account for the amount of day use certain wilderness trails receive from other hikers and anglers, so the Inyo National Forest conducts periodic day use counts—typically in August and approximately every 5 years—at Saddlebag Lake and the Harvey Monroe Hall Research Natural Area. All counts are conducted in the wilderness outside developed front country facilities. For 2016, the Inyo National Forest estimated 800 day-use hikers per week past Saddlebag Lake and 419 day-use hikers per week at the Harvey Monroe Hall Research Natural Area.

FISHING

Fishing is one of the more popular recreational activities in the Lee Vining Canyon, both along creeks and in lakes. CDFW stocks many of these locations for recreational fishing as listed in Table 6.10-3, including all three Project reservoirs and the portion of Lee Vining Creek between Saddlebag and Ellery Lakes as shown on Figure 6.10-2. As contemplated in the previous relicensing proceeding, CDFW's goal for Lee Vining Creek was to "optimize trout habitat, particularly for the adult life stage sought by anglers, and manage the fishery to develop its wild trout component" (FERC, 1992). Portions of Lee Vining Creek, both above and below Poole Powerhouse, support a regionally important recreational fishery with heavy angler use, especially at the many camping facilities found adjacent to the creek. With target resources of resident trout and recreation in mind, the current license aimed to enhance those resources through the requirement of MIFs (USFS 4e Condition No. 4; Articles 404 and 405), stable lake levels (USFS 4e Condition No. 6), and annual funding for CDFW's fish stocking program (Article 406). MIFs were required, in part, to enhance fishing opportunities in the upper Lee Vining Canyon and indirectly enhance recreation by increasing stream vegetation and creating more attractive water features. Measures to control lake levels at Tioga and Ellery Lakes were also cited as important due to substantial visitor use and angling pressure along this heavily used portion of State Route 120.

Table 6.10-3. CDFW Fishing Location Data in Project Watershed

Map ID [a]	Location	Last Stocked	Species Present	Size	Elevation (feet amsl)
1	Saddlebag Lake	2019	HT	325 acres	10,087
2	Unnamed Lake #27256	N/A	not listed	not listed	not listed
3	Gardisky Lake	N/A	BT	19.92 acres	10,480
4	Richardson Tarn	N/A	BT	0.79 acres	9,548
5	Ellery Lake	2019	HT	68 acres	9,500
6	Unnamed Lake #17323	N/A	BT	0.32 acres	9,563
7	Lee Vining Creek, South Fork	2019	HT	3 acres	9,500
8	Unnamed Lake #17334	N/A	BT, RT	2.44 acres	9,616
9	Unnamed Lake #17326	N/A	BT	1.02 acres	9,614
10	Tioga Lake	2019	BT, RT	69.11 acres	9,636
11	Thimble Lake, upper	N/A	BT	1.32 acres	9,792
12	Saddlebag Creek	2019	HT	2 miles	10,087
13	Saddlebag Creek (Lee Vining Creek)	2019	Not listed	Not listed	Not listed
14	Shell Lake	N/A	BT	4.08 acres	9,839
15	Unnamed Lake #17311	N/A	BT	2.19 acres	9,847
16	Fantail Lake	N/A	BT	8.61 acres	9,922
17	Spuller Lake	N/A	BT	4.67 acres	10,270
18	Greenstone Lake	N/A	BT	21.92 acres	10,124
19	Conness Lakes	N/A	GT	0.68 acres	10,540
20	Conness Lakes, lower	N/A	GT	5.37 acres	10,540
21	Conness Lake, middle	N/A	GT	6.91 acres	10,661
22	Unnamed Lake #17283	N/A	GT	2.43 acres	10,664

Source: CDFW, 2023

amsl = above mean sea level; BT = brook trout; GT = golden trout; HT = hatchery trout; N/A = data not available; RT = rainbow trout

[a] Note that the Map ID listed in this table corresponds to the label for each site on Figure 6.10-2.

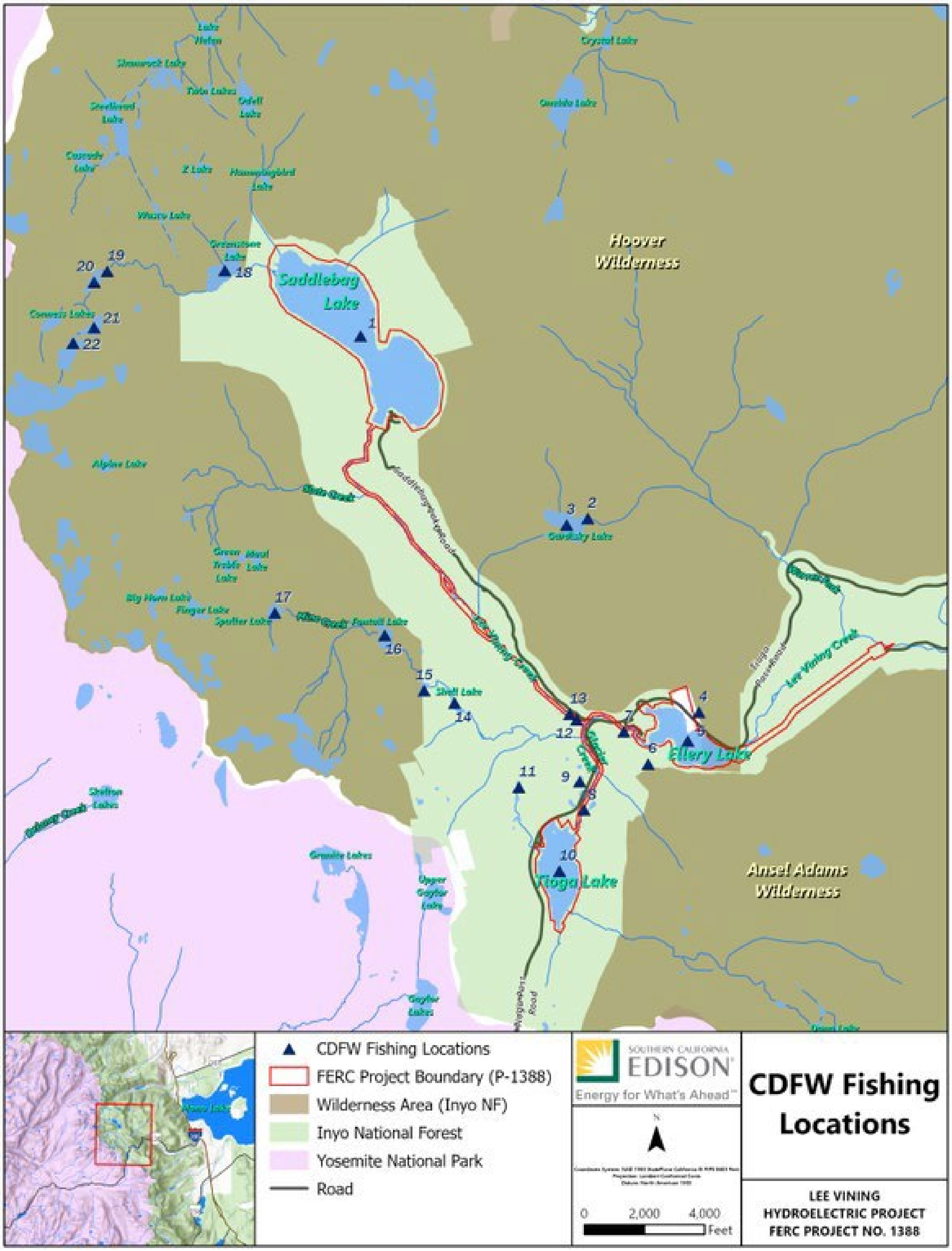


Figure 6.10-2. CDFW Fishing Locations.

BOATING

The only boating resources in the upper Lee Vining Canyon are operated by the Saddlebag Lake Resort, a concessionaire of the Inyo National Forest, at the southern end of Saddlebag Lake. Use of the boat launch is available for a fee. The resort also offers fishing, pontoon boat rentals, and a boat taxi service to the northern end of the lake, a popular location for anglers.

CLIMBING

According to Mountain Project (REI, 2020), the Lee Vining Canyon/Tioga Road area hosts approximately 101 traditional, 36 sport, 24 top rope, 33 bouldering, 21 ice, 22 mixed, and 35 alpine climbing opportunities. Many of these climbing opportunities are found along Lee Vining Creek between Ellery Lake and Poole Powerhouse and along State Route 120 between Ellery Lake and Poole Powerhouse (REI, 2020). Ice climbers in particular, most often led by local guides, will park along Poole Powerhouse Road in a pullout just before the powerhouse and hike approximately 1.5 miles up the canyon to the ice falls (Adventure Projects, 2021).

FERC FORM 80

The most recent recreational use information for the Project is provided in the Licensed Hydropower Development Recreation Report, FERC Form No. 80 (Form 80) filed in 2009. Prior to the removal of this requirement from FERC's regulations, SCE had filed and received approval for exemption from the requirements due to "little recreation potential at the Project" (FERC Order issued March 24, 2011). Before the exemption, SCE had most recently filed Form 80 data for the boat ramp and marina at Saddlebag Lake only, citing 6,031 annual daytime recreation days and a peak weekend average of recreation days of 122 (2009 Form 80). Facilities were also determined to be at 56 percent capacity.

6.10.1.2. Recreation Facilities Assessment

SCE conducted an Existing Recreation Facilities Condition Assessment (REC-2 Study) to evaluate dispersed use around the Project and the condition of and accessibility for the public to existing recreation facilities surrounding the Project. The initial phase (first study season 2022) of the REC-1 Study evaluated which Inyo National Forest recreation facilities have a potential connection to the Project and thus warranted inclusion in the broader studies in the second study season. Table 6.10-4 lists the sites that were included as part of the REC-2 Study; additionally, the sites are shown on Figure 6.10-3.

Table 6.10-4. Inyo National Forest Recreation Facilities in Upper Lee Vining Canyon

Site ID	Site Name	Facilities Condition Assessment (2023)	Dispersed Use Assessment (2022) [a]
1	Saddlebag Lake Campground	☑	☑
2	Saddlebag Lake Day Use Area	☑	☑
3	Saddlebag Lake Trailhead	☑	☑
4	Sawmill Walk-In Campground	☑	No
5	Junction Campground	☑	No
6	Bennettville Trailhead	☑	No
7	Tioga Lake Overlook Info Site / Glacier Canyon Trailhead	☑	☑
8	Tioga Lake Campground	☑	☑
9	Ellery Lake Campground	☑	☑

[a] Dispersed use assessments were generally conducted around each of the Project reservoirs (Saddlebag, Ellery, and Tioga).

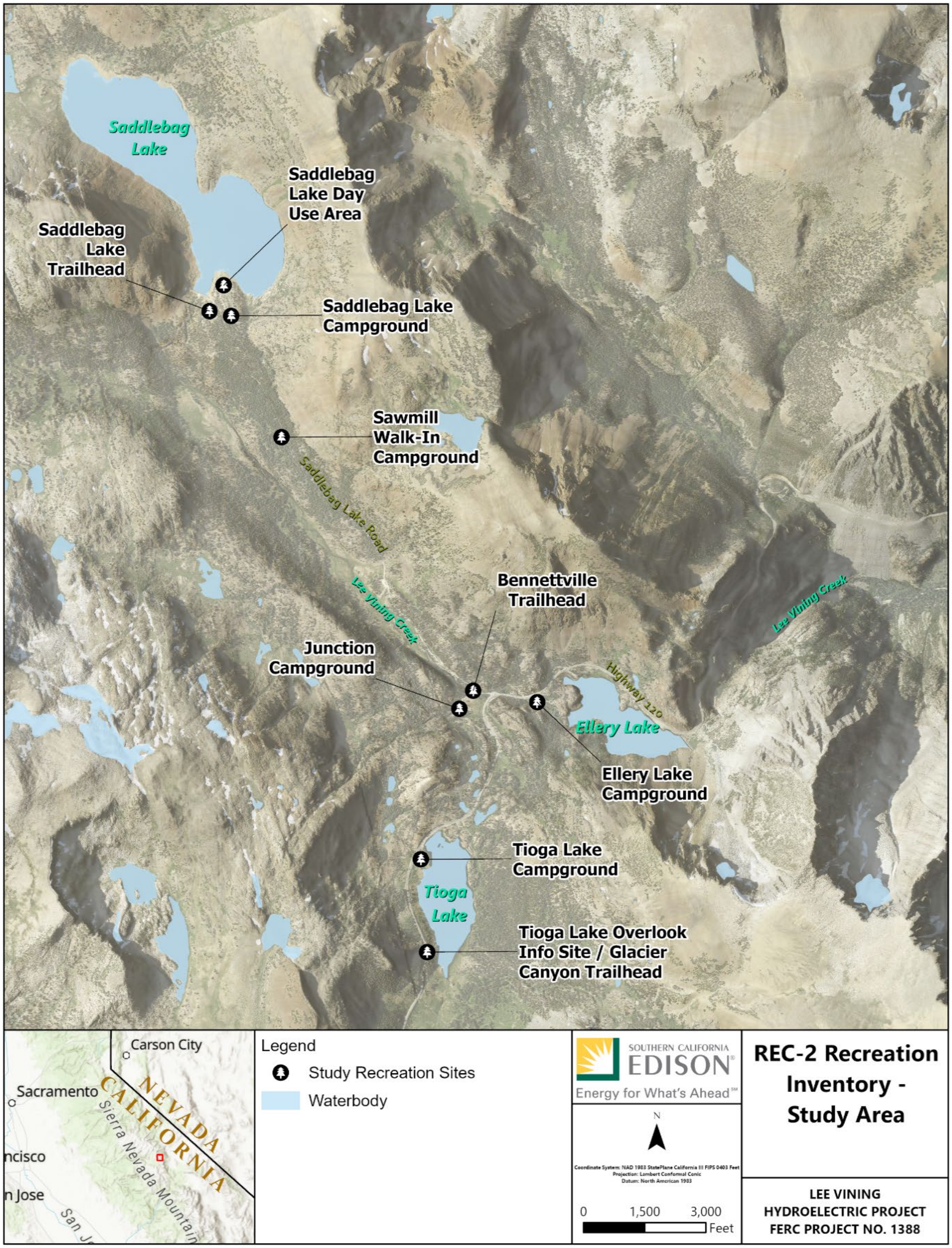


Figure 6.10-3. REC-2 Study Sites.

All recreation facilities assessed in the REC-2 Study are currently owned and operated by the Inyo National Forest. Results from the REC-2 Study conducted in 2022 and 2023 are summarized below. For more detailed information regarding each individual recreation facility, see the REC-2 Final Technical Report in Volume III of this DLA. The REC-1 Study data analysis is ongoing and will be included in the REC-1 Draft Technical Report to be filed with the FLA.

SADDLEBAG LAKE AREA

Saddlebag Lake is at the north terminus of Saddlebag Lake Road at approximately 10,000 feet amsl. Saddlebag Lake is in the headwaters of Lee Vining Creek. This area includes Saddlebag Lake Campground, Saddlebag Day Use Area, and Saddlebag Lake Trailhead Group Campground. Developed recreation amenities generally included campsites, a boat launch, restrooms, signage, picnic tables, trash receptacles, fire pits/rings, potable water, bear boxes, and a pedestrian trail, all of which are owned by USFS and operated by USFS or its concessionaires. Table 6.10-5 provides a summary of each recreation site and the associated number of amenities. During the dispersed use assessment, a number of social trails were identified around the perimeter of Saddlebag Lake. A total of 7,047.5 linear feet of trails were identified during the field assessment. One dispersed use boating site was also observed.

TIOGA LAKE AREA

Tioga Lake is south and east of State Route 120 (also called Tioga Pass Road) on Glacier Creek in Glacier Valley. The lake is approximately 9,650 feet amsl. Tioga Lake is in the headwaters of Glacier Creek. This area includes Tioga Lake Campground, Tioga Lake Overlook, and Glacier Canyon Trailhead. Developed recreation amenities generally included the overlook, campsites, restrooms, signage, picnic tables, trash receptacles, firepits/rings, potable water, and bear boxes, all of which are owned by the Inyo National Forest Service and operated by the Inyo National Forest Service or its concessionaires. Table 6.10-5 provides a summary of each recreation site and the associated number of amenities. During the dispersed use assessment, a number of social trails and impromptu parking areas were identified around the perimeter of Tioga Lake. A total of 9,923.6 linear feet of trails were identified. One dispersed use boating site, five pullout sites, two campsites, and three fire pits were also observed.

ELLERY LAKE AND RHINEDOLLAR DAM AREA

Ellery Lake and Rhinedollar Dam are south of State Route 120 on Lee Vining Creek. Flows from Saddlebag Lake, Tioga Lake, Lee Vining Creek, and Glacier Creek feed into Ellery Lake. The lake is approximately 9,500 feet amsl. This area includes Ellery Lake Campground. Developed recreation amenities at Ellery Lake Campground generally included an overlook, campsites, an electrical hookup, restrooms, signage, picnic tables, trash receptacles, firepits/rings, potable water, and bear boxes, all of which are owned by the Inyo National Forest Service and operated by the Inyo National Forest Service or its concessionaires. Table 6.10-5 provides a summary of each recreation site and the associated number of amenities. During the dispersed use assessment, a number of social trails and impromptu parking areas were identified around the perimeter of Ellery Lake and Rhinedollar Dam. A total of 8,930.1 linear feet of trails were identified at Ellery Lake and 3,607.1 linear feet were identified at Rhinedollar Dam. Seven dispersed use pullout sites, two trailheads, and three fire pits were also observed.

SITES BETWEEN SADDLEBAG AND ELLERY LAKES

Three additional recreation sites located below Saddlebag Lake but above Ellery Lake and Tioga Lake were included in the REC-2 Study: Bennettville Trailhead, Junction Campground, and Sawmill Walk-In Campground. These three sites are all located along Lee Vining Creek and are adjacent to the FERC Project Boundary (Figure 6.10-1). Sawmill Walk-In Campground is approximately 3,000 feet downstream of Saddlebag Lake. Bennettville Trailhead and Junction Campground are approximately 2,500 feet upstream of Ellery Lake.

Table 6.10-5. Recreation Site Amenities

Site ID	Site Name	Bear Box	Campsite	Electric Hookup	Firepit/ring	Foot Bridge	Overlook	Pedestrian Trail	Picnic Table	Potable Water	Restroom	Trash Receptacle	Boat Launch
1	Saddlebag Lake Campground	20	20	0	20	0	0	1	20	3	2	4	0
2	Saddlebag Lake Day Use Area	0	0	0	1	0	0	2	0	1	1	0	2
3	Saddlebag Lake Trailhead	3	1	0	2	0	0	0	4	1	1	2	0
4	Sawmill Walk-In Campground	11	11	0	11	0	0	0	11	0	2	3	0
5	Junction Campground	14	14	0	14	1	0	0	14	0	2	0	0
6	Bennettville Trailhead	0	0	0	0	0	0	1	0	0	0	2	0
7	Tioga Lake Overlook Info Site / Glacier Canyon Trailhead	0	0	0	0	0	1	1	2	0	1	0	0
8	Tioga Lake Campground	13	13	0	13	0	0	0	13	1	1	2	0
9	Ellery Lake Campground	15	15	1	15	0	1	0	15	2	2	3	0

6.10.1.3. Inyo National Forest—National Visitor Use Monitoring Report (Fiscal Year 2016 Data)

The National Visitor Use Monitoring (NVUM) Program has two goals: (1) to produce estimates of the volume of recreational visitation to national forests and grasslands, and (2) to produce descriptive information about that visitation, including activity participation, demographics, visit duration, measures of satisfaction, and trip spending connected to the visit (USFS, 2018b). The most recent visitor use report for the Inyo National Forest was updated on January 21, 2018, and summarizes data collected during fiscal year 2016. The following is a summary of that report.

Total visits to the Inyo National Forest[10] in fiscal year 2016 were estimated at 2,309,000 individuals. Many people frequent more than one site during their visit, so estimates are further broken down by site visits, totaling 4,624,000 visits.[11] The most commonly frequented site or area associated with the Inyo National Forest is Day Use Developed (2,608,000 visits), followed by Overnight Use Developed (876,000 visits), General Forest Area (850,000 visits), and Designated Wilderness (290,000 visits). Site visits are further broken down by each activity in which the individual participated during that visit. The most common activities selected by survey participants were viewing natural features, hiking/walking, relaxing, downhill skiing, viewing wildlife, and driving for pleasure. The most commonly chosen main activity by survey participants was downhill skiing followed by hiking/walking, viewing natural features, and bicycling.

6.10.2. Potential Adverse Effects and Issues

There are no recreation facilities associated with the Project and no changes to existing O&M activities are proposed with regard to recreation facilities with this DLA, therefore no effects have been identified for the No Action or the Proposed Action. The REC-1 Study is in progress through October 2024. A REC-1 Draft Technical Report will be included with the FLA. Discussions with agencies and TWG members are ongoing.

6.10.2.1. Consistency with Inyo National Forest Land Management Plan

The LMP for the Inyo National Forest (USFS, 2019) was developed to provide direction and adaptive management for the resources in the Project Area. Sustainable Recreation is identified in the LMP as one of the seven management areas as identified in the Land Use section (Section 6.11, *Land Use*) and all land in the FERC Project Boundary is designated as a Destination Recreation Area (High Use).

[10] The 2018 NVUM Report (USFS, 2018b) defines a national forest visit as the entry of one person upon a national forest to participate in recreational activities for an unspecified period of time. A national forest visit can be composed of multiple site visits. The visit ends when the person leaves the national forest to spend the night somewhere else.

[11] The 2018 NVUM Report (USFS, 2018b) defines a site visit as the entry of one person onto a national forest site or area to participate in recreational activities for an unspecified period of time. The site visit ends when the person leaves the site or area for the last time on that day.

The following Inyo National Forest-wide (REC-FW) desired conditions (DC), goals (GOAL), standards (STD), and guidelines (GDL) were found to be relevant to and consistent with this study:

- REC-FW-DC 01: The diverse landscapes of the Inyo National Forest offer a variety of recreation settings for a broad range of year-round, nature-based recreation opportunities. Management focuses on settings that enhance the national forest recreation program niche.
- REC-FW-DC 02: The condition, function, and accessibility of recreation facilities accommodate diverse cultures with appropriate activities available to the public.
- REC-FW-DC 05: Visitors can connect with nature, culture, and history through a range of sustainable outdoor recreation opportunities.
- REC-FW-DC 11: The Inyo National Forest provides a range of year-round developed and dispersed recreation settings that offer a variety of motorized and nonmotorized opportunities and recreation experiences.
- REC-FW-DC 12: Trails used in summer provide access to destinations, provide for opportunities that connect to a larger trail system, provide linkages from local communities to the national forest, and are compatible with other resources.
- REC-FW-GDL 02: Create infrastructure that mimics the natural textures and colors of the surrounding landscape to be consistent with the recreation setting.

Additionally, the sites were found to align with the following Area-Specific desired conditions (DC), goals (GOAL), standards (STD), and guidelines (GDL):

- MA-DRA-DC 01: The developed area footprint within destination recreation areas is visually appealing and well maintained.
- MA-DRA-DC 02: A natural appearing landscape is retained outside the development footprint.
- MA-DRA-DC 03: Most recreation facilities are highly developed and in close proximity to each other.
- MA-DRA-DC 04: Developed sites meet national quality standards.
- MA-DRA-DC 05: Forest roads and trails provide users relatively easy access to destinations.
- MA-DRA-DC 06: The setting provides amenities and sustainable infrastructure to support a wide variety of recreational activities in close proximity to each other.
- MA-DRA-DC 07: Available infrastructure and amenities are consistent with user capacity.

- MA-DRA-DC 08: Interpretation and education activities provide learning opportunities to visitors about the natural and cultural environment and responsible visitor behavior.
- MA-DRA-DC 09: Traffic and parking does not negatively impact visitor experience.
- MA-GRA-DC 02: Scenic integrity is generally moderate to high. Where developed facilities are present, they are aesthetically incorporated into the landscape. Scenic integrity is maintained at or enhanced from current conditions.
- MA-GRA-DC 03: Places for people seeking natural scenery and solitude are available in some areas. In other areas, motorized and nonmotorized recreation opportunities are easily accessed by roads, and visitors can expect encounters with others.
- MA-GRA-DC 04: Developed recreation sites provide opportunities on the more roaded natural, semi-primitive motorized, and semi-primitive nonmotorized opportunity spectrum with moderately modified natural settings.
- MA-GRA-DC 05: A mosaic of vegetation conditions is often present, with some areas showing the effects of past management activities, and other areas appearing predominantly natural.

6.10.2.2. Protection, Mitigation, and Enhancement Measures

The Proposed Action does not include any Project-related recreation facilities and no effects have been identified; therefore, no PME measures are proposed for recreation.

6.11. LAND USE

This section describes land use within and in the vicinity of the Project.

6.11.1. AFFECTED ENVIRONMENT

The Project is located on Lee Vining and Glacier Creeks in the glacially carved Upper Lee Vining Canyon, approximately 9 miles upstream of Mono Lake and outside the unincorporated town of Lee Vining, California, less than 1 mile north of the eastern entrance to Yosemite National Park. The Project consists of three high elevation reservoirs: Saddlebag Lake (elevation 10,089 feet), Tioga Lake (elevation 9,650 feet), and Ellery Lake (elevation 9,493 feet).

The Project is located in the northernmost part of the Inyo National Forest, which stretches 165 miles north to south along the eastern Sierra Nevada, featuring over 2 million acres of pristine lakes, winding streams, rugged peaks, and arid Great Basin Mountains (USFS, 2020). The Inyo National Forest features some of the world's oldest trees in the Ancient Bristlecone Pine Forest in the White Mountains (which mark the eastern boundary of Owens Valley), glaciers along the Sierra Nevada crest, and an elevation range from the tallest peak in the lower 48 states (Mount Whitney at elevation 14,494 feet) to semiarid deserts and valleys at elevation 3,900 feet.

The Inyo National Forest also contains nine congressionally designated wilderness areas: Hoover, Ansel Adams, John Muir, Golden Trout, Inyo Mountains, Boundary Peak, South Sierra, White Mountain, and Owens River Headwaters. Devils Postpile National Monument, administered by the National Park Service, is within the Inyo National Forest in the Reds Meadow area west of Mammoth Lakes.

6.11.1.1. Land Use, Land Cover, and Land Management in the Existing FERC Project Boundary and Adjacent Lands

Land ownership both within the FERC Project Boundary and within a 0.5-mile buffer of it are composed predominantly of federal lands administered by the Inyo National Forest, with a small portion of lands owned by SCE. In the existing FERC Project Boundary, 97 percent (595.4 acres) are federal lands administered by the USFS and 3 percent (20.1 acres) are owned by SCE.

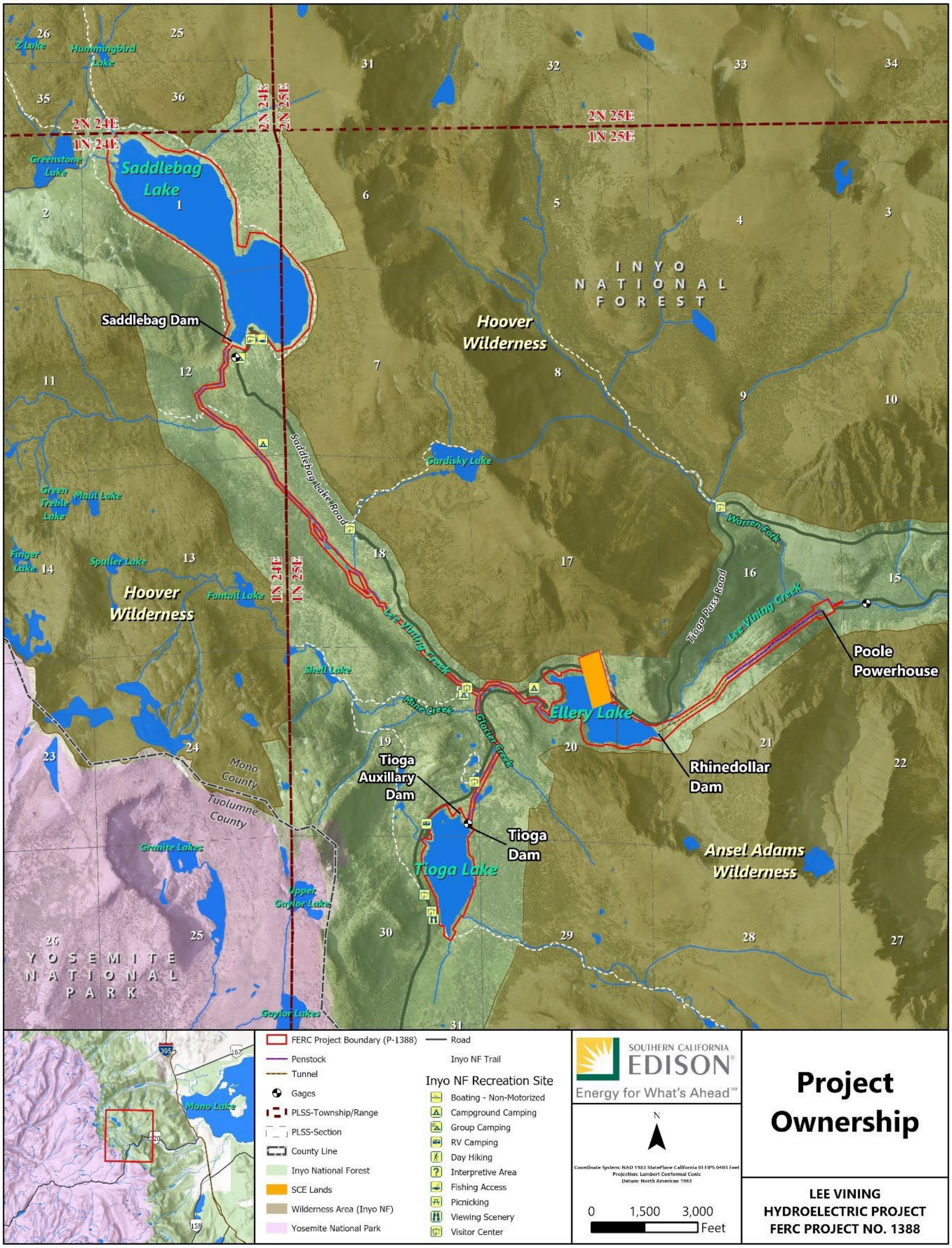


Figure 6.11-1. Project Land Ownership in Existing FERC Project Boundary.

Table 6.11-1. Land Ownership within the Existing FERC Project Boundary

Ownership	Acreage	Percentage of Total
Forest Service	595.35	97%
SCE	20.12	3%
Total Project Acreage	**615.47**	

SCE = Southern California Edison

Land use and cover within the existing FERC Project Boundary was estimated by analyzing the Multi-Resolution Land Characteristic Consortium's 2023 NLCD, which provides land use information by generalizing land cover within the area (MRLC Consortium, 2023), and is depicted on Figure 6.11-2 and summarized in Table 6.11-2. Predominant land cover within the existing FERC Project Boundary is overwhelmingly classified as Open Water (62.2 percent), due largely to the narrowly drawn FERC Project Boundary around Project waters—Saddlebag, Tioga, and Ellery Lakes; and Lee Vining and Glacier Creeks.

The remainder of Project lands is largely dominated by Shrub/Scrub (21.19 percent) and Evergreen Forest (7.25 percent). To gain a better understanding of land use and cover in the broader Project Area, NLCD data was also analyzed within a 0.5-mile buffer of the existing FERC Project Boundary. As is typical of the Upper Lee Vining Canyon, almost entirely within the Inyo National Forest, land cover is predominantly Shrub/Scrub (54.95 percent), Evergreen Forest (24.03 percent), Barren Land (Rock/Sand/Clay; 8.86 percent), and Open Water (6.72 percent).

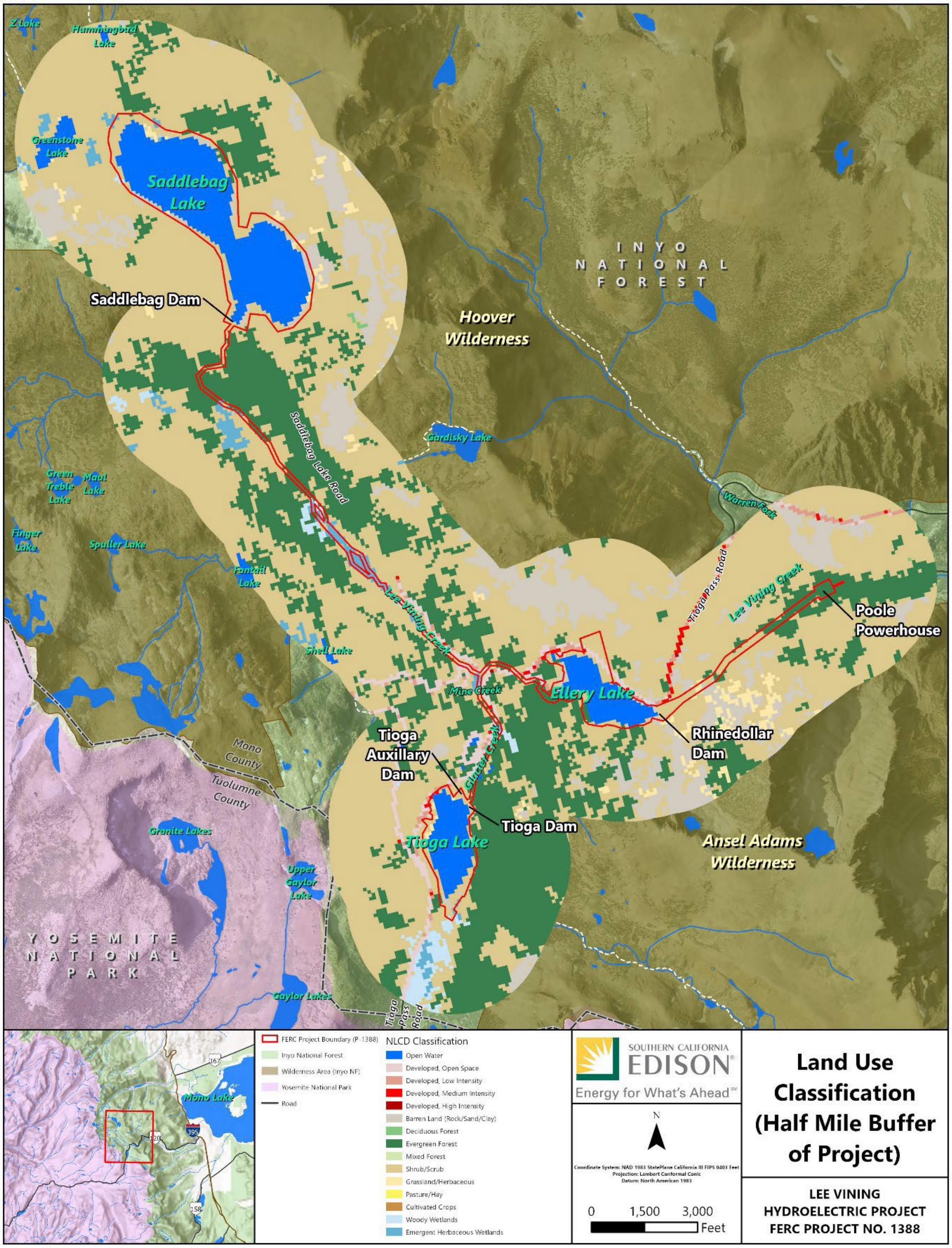


Figure 6.11-2. Land Use Classifications in Immediate Project Vicinity.

Table 6.11-2. National Land Cover Database Classifications within the Existing FERC Project Boundary

NLCD Classification	0.5-mile Buffer of FERC Project Boundary		Existing FERC Project Boundary	
	acres	percentage	acres	percentage
Shrub/Scrub	3,398.2	54.95%	130.4	21.19%
Evergreen Forest	1,486.1	24.03%	44.7	7.25%
Barren Land (Rock/Sand/Clay)	547.9	8.86%	23.0	3.73%
Open Water	415.7	6.72%	382.9	62.21%
Developed, OpenSpace	88.2	1.43%	6.6	1.07%
Grassland/Herbaceous	76.1	1.23%	7.3	1.18%

FERC = Federal Energy Regulatory Commission; NLCD = National Land Cover Database

6.11.1.2. Inyo National Forest Land Management Plan

The 2019 Inyo National Forest LMP is intended to identify long-term or overall desired conditions and provide general direction for achieving those desired conditions (USFS, 2019).

As it relates to land use, special uses of National Forest System lands are managed in a way that protects natural resources, public health, and safety. Section 6.11.2.2, *Consistency with Current Resource Management Objectives*, provides a summary of forest-wide desired conditions related to land use in the Inyo National Forest. Further details regarding guidelines and potential management approaches for each desired condition may be found in the 2019 LMP.

The 2019 LMP defines the following seven management areas for the Inyo National Forest: fire management zones, conservation watersheds, riparian conservation areas, sustainable recreation, recommended wilderness, eligible wild and scenic rivers, and the Pacific Crest National Scenic Trail (PCT) corridor. The FERC Project Boundary and its 0.5-mile buffer fall within five of the seven management areas, as listed in Table 6.11-3.

Table 6.11-3. Inyo National Forest Management Areas Relevant to Project

Management Area	Discussion of Relevance to the Project
Fire Management Zones	Summarized below in *Fire History and Fuels Management*
Conservation Watersheds	Discussed in detail in Exhibit E, Section 6.2, *General Description of the River Basin*

Management Area	Discussion of Relevance to the Project
Riparian Conservation Areas	Discussed in detail in Exhibit E, Section 6.8, *Wetland, Riparian, and Littoral Resources*
Sustainable Recreation	Summarized below in *Sustainable Recreation Management Areas*
Eligible Wild and Scenic Rivers	Discussed in detail in Exhibit E, Section 6.12.1.3, *Wild and Scenic Rivers and Scenic Highways/Byways*

The 2019 LMP also defines the following ten designated areas for the Inyo National Forest: wilderness, Mono Basin National Forest Scenic Area, wild and scenic rivers, Ancient Bristlecone Pine Forest National Protection Area, the PCT, inventoried roadless areas, national recreation trails, research natural areas, scenic byways, and wild horse and burro territories. The only designated area to cross the FERC Project Boundary and its 0.5-mile buffer is the Lee Vining Canyon Scenic Byway (discussed in more detail in Exhibit E, Section 6.12.1.3, *Wild and Scenic Rivers and Scenic Highways/Byways*), which crosses the FERC Project Boundary multiple times as it runs along Ellery and Tioga Lakes. While not affecting the FERC Project Boundary and its 0.5-mile buffer, the following designated areas are found in the vicinity of the Project:

- Hoover and Ansel Adams Wilderness Areas, which closely encompass the FERC Project Boundary;
- Inventoried Roadless Areas within the Upper Lee Vining Canyon;
- Mono Basin National Forest Scenic Area, approximately 9 miles downstream of the Project and surrounding Mono Lake; and
- Harvey Monroe Hall Research Natural Area, just west of the Project in the Hoover Wilderness and which can be accessed by the Carnegie Station Trail that crosses the FERC Project Boundary.

FIRE HISTORY AND FUELS MANAGEMENT

According to California Department of Forestry and Fire Protection (CAL FIRE) data, since 1910, there have been no recorded wildfires within or directly adjacent to the FERC Project Boundary or in the Upper Lee Vining Canyon (CAL FIRE, 2020). If the search is expanded to a 5-mile radius from the FERC Project Boundary, 11 wildfires have been recorded (CAL FIRE, 2020).

Fire prevention and fuels management within and adjacent to the FERC Project Boundary are primarily provided by the Inyo National Forest through a cooperative program that involves an agreement for the exchange of fire protection services with federal wildland fire agencies, including the USFS, BLM, and National Parks Service (CAL FIRE, 2024). The goal of the agreement is for the closest agency to respond to a wildfire, regardless of jurisdiction.

To reduce fire hazards associated with Project facilities, SCE implements preventative measures that focus on threats to employees and facilities and include vegetative management, inspection of facilities, and mitigation of potential wildfire hazards that could affect business operations, employees, and SCE infrastructure (Kleinschmidt Associates, 2018). More detailed information regarding fire suppression and management at the Project site is found in SCE's Emergency Management Plan for the Project, much of which is considered CEII and not discussed here.

SUSTAINABLE RECREATION MANAGEMENT AREAS

The 2019 LMP has designated all Project land within the Inyo National Forest as a destination recreation area (High Use). Destination recreation areas are defined as having "high levels of recreation, supported by more facilities, amenities, and services than other areas" (USFS, 2019).

6.11.2. POTENTIAL ADVERSE EFFECTS AND ISSUES

6.11.2.1. Evaluation of the Accuracy of the Existing FERC Project Boundary and Whether Lands Should be Added or Removed from the FERC Project Boundary

Pursuant to FERC guidance, the FERC Project Boundary must encompass all lands necessary for Project O&M purposes over the term of the FERC license. SCE has reviewed the existing FERC Project Boundary and identified locations where lands should be added or removed. Results of SCE's review are summarized in the *LAND-1 Project Lands and Roads Final Technical Report*, included in Volume III of this DLA. Table 6.11-4 summarizes those proposed changes tied to operations and facilities, and changes specifically related to Project lands and roads are identified in Table 6.11-5.

The LAND-1 Final Technical Report concentrates on proposed modifications to Project lands involving features that are either not presently accounted for in the Project license (addition) or are no longer required for Project purposes (removal). Each proposal is accompanied by a unique ID, figure reference, brief description, recommended action, and rationale for the proposed boundary adjustment, where relevant. The LAND-1 Final Technical Report does not delve into minor boundary modifications resulting from improved data accuracy, such as refined mapping details like centerlines and buffers for roads, flowlines, or creeks within the FERC Project Boundary.

Table 6.11-4. Proposed FERC Project Boundary Changes Related to Operations/Facilities

ID	Figure Reference	Current Description	Proposed Action	Reason for Proposed FERC Project Boundary Change
Operations/ Facilities—1	Figure 6.11-4	Lands north of the Tioga Auxiliary Dam are currently used for access to the dam and are not included in the FERC Project Boundary.	Add 0.14 acre to the FERC Project Boundary. This addition encompasses lands currently owned by the USFS.	Addition of Project lands currently in use by Project operations.
Operations/ Facilities—2	Figure 6.11-5	Lands surrounding Tioga Pass Road above Ellery Lake were used as a staging area during Project construction and are included in the FERC Project Boundary but are no longer needed for Project operations.	Remove 13.85 acres from the FERC Project Boundary. This removal encompasses lands currently owned by SCE.	Removal of Project lands currently not used by Project operations.

FERC = Federal Regulatory Commission; ID = identification; SCE = Southern California Edison; USFS = U.S. Forest Service

Table 6.11-5. Proposed FERC Project Boundary Changes Related to Project Roads and/or to the Project Roads Inventory

ID	Figure Reference	Current Description	Proposed Action	Reason for Proposed FERC Project Boundary Change
Road—1	Figure 6.11-3	An access road to Saddlebag Dam is not currently within the FERC Project Boundary or listed as an official Project road.	Add, in part, 2.05 acres to FERC Project Boundary and Project Roads Inventory. This addition encompasses lands currently owned by the USFS and managed by SCE.	Addition of Project lands (Project roads).
Road—2	Figure 6.11-3	An access road to Saddlebag Dam is not currently within the FERC Project Boundary or listed as an official Project road.	Add, in part, 2.05 acres to FERC Project Boundary and Project Roads Inventory. This addition encompasses lands currently owned by the USFS and managed by SCE.	Addition of Project lands (Project roads).
Road—3	Figure 6.11-3	An access road to Saddlebag Dam is not currently within the FERC Project Boundary or listed as an official Project road.	Add, in part, 2.05 acres to FERC Project Boundary and Project Roads Inventory. This addition encompasses lands currently owned by the USFS and managed by SCE.	Addition of Project lands (Project roads).

ID	Figure Reference	Current Description	Proposed Action	Reason for Proposed FERC Project Boundary Change
Road—4	Figure 6.11-3	An access road to Saddlebag Dam is not currently within the FERC Project Boundary or listed as an official Project road.	Add, in part, 2.05 acres to FERC Project Boundary and Project Roads Inventory. This addition encompasses lands currently owned by the USFS and managed by SCE.	Addition of Project lands (Project roads).
Road—5	Figure 6.11-4	An access road to the Project is not currently within the FERC Project Boundary or listed as an official Project road.	Add 0.52 acre to FERC Project Boundary and Project Roads Inventory. This addition encompasses lands currently owned by the USFS and managed by SCE.	Addition of Project lands (Project roads).

FERC = Federal Regulatory Commission; ID = identification; SCE = Southern California Edison; USFS = U.S. Forest Service

Based on results of the LAND-1 Study, the proposed boundary modifications described above would result in the land ownership within the FERC Project Boundary shown in Table 6.11-6. *Land ownership of all parcels will be verified for the FLA, after discussions with the appropriate agencies.*

Table 6.11-6. Land Ownership within the Proposed FERC Project Boundary

Ownership	Acreage	Percentage of Total
U.S. Forest Service	535.99	98.8%
Southern California Edison	6.26	1.2%
Total Project Acreage	**542.25**	**100%**

NO ACTION

Under the No Action, the Project would continue to operate under the terms and conditions of the current license, and the FERC Project Boundary would not change. As such, there would be no effects resulting from implementation of the No Action.

PROPOSED ACTION

After analyzing available data and consulting with SCE staff, a comprehensive list of suggested adjustments to the existing FERC Project Boundary has been compiled (Tables 6.11-4 and 6.11-5) and described in the LAND-1 Final Technical Report, provided in Volume III of this DLA. The proposed adjustments primarily aim to ensure thorough coverage of all current Project operations and facilities, including existing and planned

Project roads and trails. As part of the Proposed Action, SCE is proposing the following major adjustments to the FERC Project Boundary:

- Addition of 2.05 acres of USFS land at Saddlebag Dam (Figure 6.11-3)
- Addition of 0.52 acres of USFS land at Tioga Dam (Figure 6.11-4)
- Removal of 13.85 acres of SCE-owned land at Ellery Lake / Rhinedollar Dam (Figure 6.11-5)

Note that minor boundary refinements have occurred surrounding creeks and reservoirs resulting from improved data accuracy, such as refined mapping details like centerlines and buffers for roads, flowlines, or creeks within the FERC Project Boundary. Though the refinements may account for a number of acres being added or removed from the Boundary where the creek has shifted over time, they are not all accounted for here.

No changes to land use or ownership are included under the Proposed Action; therefore, no adverse effects are anticipated.

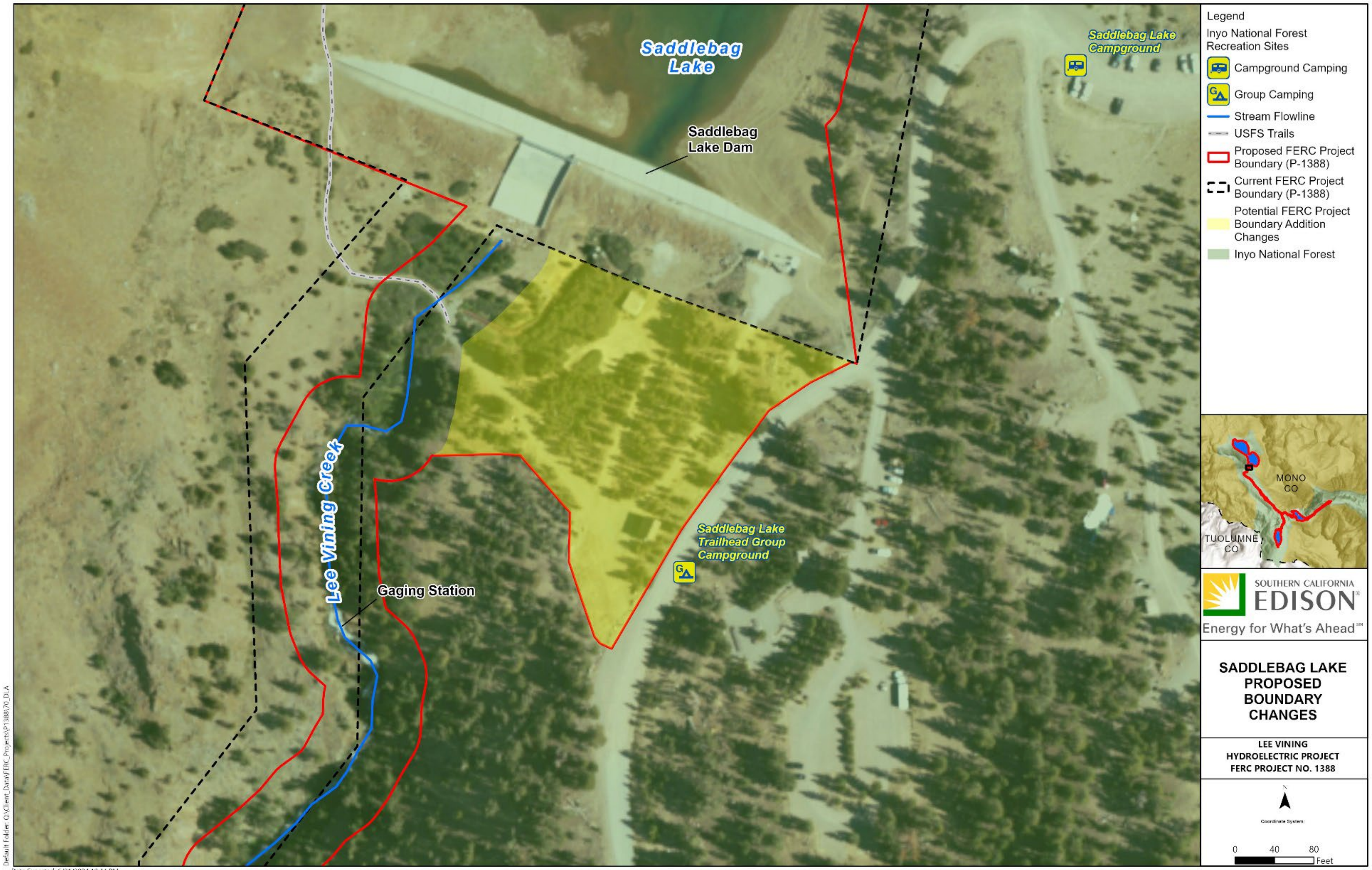


Figure 6.11-3. Proposed FERC Project Boundary Changes at Saddlebag Lake.

Figure 6.11-4. Proposed FERC Project Boundary Changes at Tioga Lake.

Figure 6.11-5. Proposed FERC Project Boundary Changes at Ellery Lake.

6.11.2.2. Consistency with Current Resource Management Objectives (Forest Plans, Basin Plan, etc.)

SCE has reviewed the desired conditions in the 2019 LMP (USFS, 2019) to assess whether the Project is consistent with stated management objectives. The desired conditions relating to recreation and land use, with which the Project is consistent, include:

- INFR-FW-DC 01: A minimum and efficient national forest transportation system, administrative sites, and other infrastructure and facilities are in place and maintained at least to the minimum standards appropriate for planned uses and the protection of resources.
- INFR-FW-DC 02: Management operations on the Inyo National Forest are energy and water efficient.
- INFR-FW-DC 03: Roads allow for safe and healthy wildlife movement in areas of human development. Vehicular collisions with animals are rare.
- LAND-FW-DC 01: Land ownership and access management support authorized activities and uses on National Forest System lands. Land exchanges promote improved management of National Forest System lands.
- LAND-FW-DC 02: Coordination of land and resource planning efforts with other Federal, State, Tribal, county, and local governments, and adjacent private landowners, promotes compatible relationships between activities and uses on National Forest System lands and adjacent lands of other ownership.
- MA-GRA-DC 03: Places for people seeking natural scenery and solitude are available in some areas. In other areas, motorized and non-motorized recreation opportunities are easily accessed by roads, and visitors can expect encounters with others.
- REC-FW-DC 01: The diverse landscapes of the Inyo National Forest offer a variety of recreation settings for a broad range of year-round, nature-based recreation opportunities. Management focuses on settings that enhance the national forest recreation program niche.
- REC-FW-DC 02: The condition, function, and accessibility of recreation facilities accommodates diverse cultures with appropriate activities available to the public.
- REC-FW-DC 03: Recreation opportunities provide a high level of visitor satisfaction. The range of recreation activities contribute to social and economic sustainability of local communities.
- REC-FW-DC 04: Areas of the national forest provide for a variety of activities with minimal impact on sensitive environments and resources.

- REC-FW-DC 05: Visitors can connect with nature, culture, and history through a range of sustainable outdoor recreation opportunities.
- REC-FW-DC 06: The management and operation of facilities are place based, integrated, and responsive to changes that may limit or alter access.
- REC-FW-DC 07: New developed recreation infrastructure is located in ecologically resilient landscapes, while being financially sustainable, and responsive to public needs.
- REC-FW-DC 08: Summer dispersed recreation occurs in areas outside of high visitation, developed facilities or communities, and does not adversely impact natural or cultural resources.
- WTR-FW-DC 05: Infrastructure (administrative sites, recreation facilities, and roads) has minimal adverse effects to riparian and aquatic resources.

6.11.2.3. Protection, Mitigation, and Enhancement Measures

Implementation of the Proposed Action would not have an effect on land use or land ownership in the Project Area; therefore, no PME measures are proposed for land use as part of the Proposed Action.

6.12. AESTHETIC RESOURCES

This section describes the aesthetic resources at and in the Project Vicinity. The discussion is intended to provide background for evaluating potential issues relating to the Proposed Action and how the completed Visual Resource Assessment (LAND-2) Study informs the understanding of Project effects. Aesthetic resources include the visual characteristics of the lands and waters affected by the Project, including a description of the dams, natural water features, and other scenic attractions of the Project and surrounding vicinity. Noises associated with Project operations would remain largely the same; therefore, no noise/auditory effects analysis has been completed for this DLA.

6.12.1. AFFECTED ENVIRONMENT

6.12.1.1. Visual Character of Project Features and Lands

Project facilities include three dams and reservoirs, an auxiliary dam, an underground flowline consisting of a pipeline and penstock, and a powerhouse (Figure 6.12-1). The principal Project features were constructed in the early 1920s and have been part of the landscape and scenic character of the Lee Vining Canyon for approximately 100 years. Saddlebag Lake is relatively hidden in a valley higher than the rest, but Tioga and Ellery Lakes are adjacent to and visible from State Route 120, the highly trafficked, seasonal pass (Tioga Pass) through the Sierra Nevada that connects many of California's major metropolitan areas (Sacramento, San Francisco, Fresno, Los Angeles, San Diego) to prime outdoor recreation areas on either side of the range. Saddlebag Dam impounds the 297-acre Saddlebag Lake, Tioga Dam impounds the 73-acre Tioga Lake, and Rhinedollar Dam impounds the 61-acre Ellery Lake. Both Saddlebag Lake and Tioga Lake drain into Ellery Lake, which is the intake and regulating reservoir for the Poole Powerhouse. The intake structure at Rhinedollar Dam (Ellery Lake) includes an underground pipeline and penstock leading to the Poole Powerhouse. The Poole Powerhouse is a reinforced concrete building constructed in the 1920s. It is located on Lee Vining Creek east (downstream) of Ellery Lake.

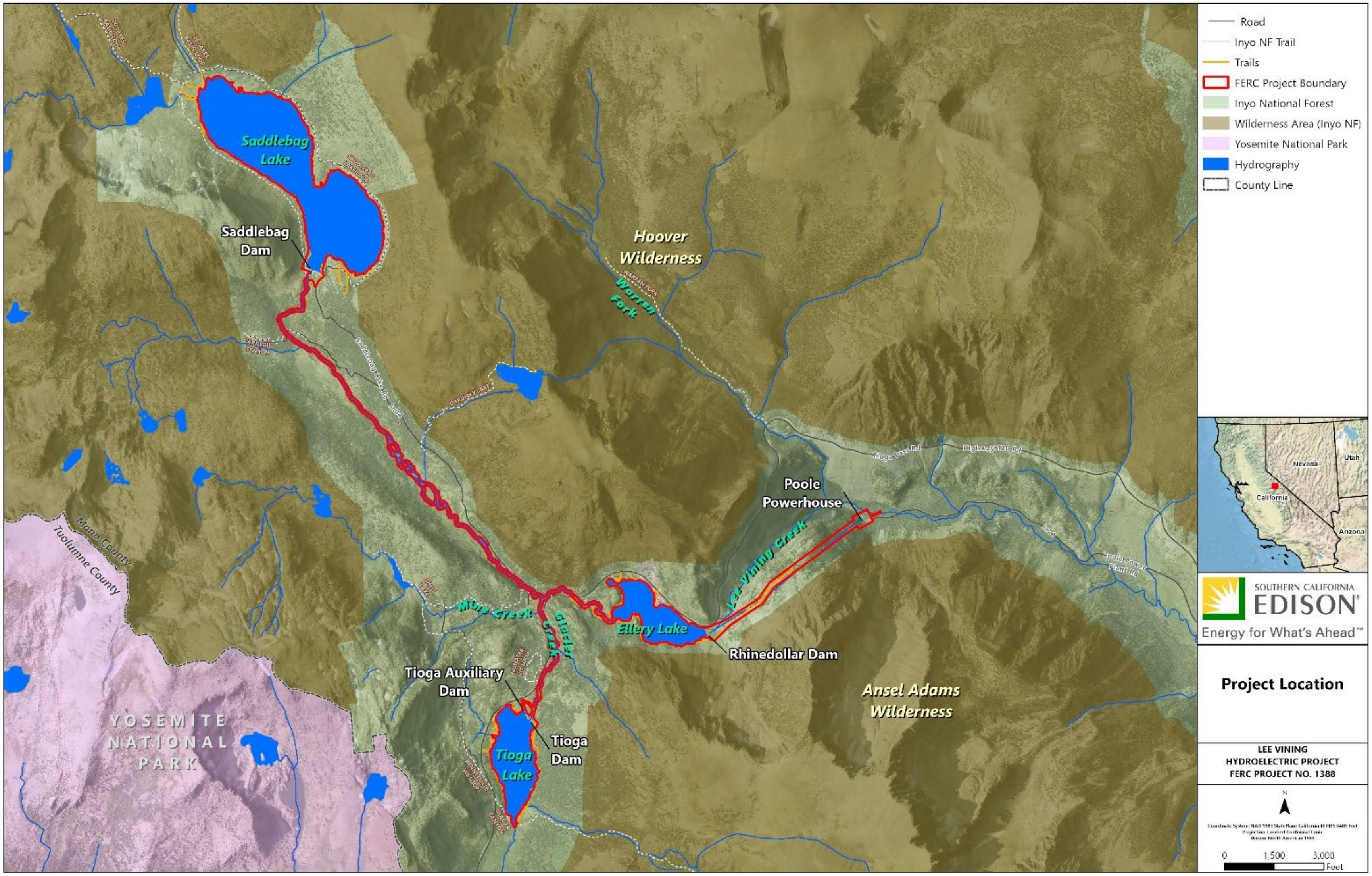


Figure 6.12-1. Project Location.

The Project facilities are rockfill/earthen dams with some areas of exposed concrete in earth tone colors. The various dams and concrete areas are similar in color to the surrounding rock boulders and mountains and blend into their surrounding environment. The Poole Powerhouse is beige in color and is built directly next to, and flanked by, an exposed rock mountain and also blends into the landscape with similar earth tone colors.

The scenic character of the impoundments and creek areas are predominantly undeveloped shorelines with occasional recreation facilities and structures. The surrounding vegetation primarily includes evergreen trees and forests, shrubs, grasses and grasslands, and meadows and wetlands with nearby lakes and creeks. Vegetated areas are followed by barren rock, exposed rock boulders, and distant views of hills and mountains beyond. The lowland and surrounding mountain areas are covered in dispersed snow in winter.

Figure 6.12-2 provides a view of the Project Area, Figures 6.12-3 through 6.12-6 show representative views of the Project dams, and Figure 6.12-7 provides a view of the Poole Powerhouse. Figures 6.12-8 through 6.12-12 provide representative views of reservoirs and creeks within the existing FERC Project Boundary.

Figure 6.12-2. Overview of Project Area.

Figure 6.12-3. Saddlebag Dam.

Figure 6.12-4. Tioga Dam and Spillway.

Figure 6.12-5. Tioga Dam Outlet.

Figure 6.12-6. Rhinedollar Dam (Ellery Lake) and Spillway.

Figure 6.12-7. Poole Powerhouse (right) and Triplex Cottage (left).

Figure 6.12-8. Glacier Creek.

Figure 6.12-9. Lee Vining Creek Below Rhinedollar Dam.

Figure 6.12-10. Saddlebag Lake.

Figure 6.12-11. Tioga Lake.

Figure 6.12-12. Ellery Lake.

6.12.1.2. Nearby Scenic Attractions

The Project resides within Inyo National Forest in Mono County, California, which stretches 165 miles north to south along the eastern Sierra Nevada. With over 2 million acres, the Inyo National Forest features the oldest trees on the planet (Ancient Bristlecone Pine Forest), the tallest mountain in the lower 48 states (Mount Whitney at an elevation of 14,505 feet), and the oldest inland seas in America (Mono Lake). Other features of the Inyo National Forest include the Mammoth Lakes Basin, glaciers, desert land, and the eastern Sierra Nevada (USFS, 2023).

Recreation opportunities at the national forest include camping, hiking, biking, hunting, water activities, nature viewing, climbing, fishing, and snow sports. The nearest national trail to the Project is the PCT, which traverses along the western side of the Sierra Nevada crest through Yosemite National Park (see Section 6.10, *Recreation*, for more information).

One of the United States' most popular parks, Yosemite National Park, is located 1 mile west of the Project and had approximately 3.7 million visitors in 2022 (NPS, 2023).

Approximately 9 miles downstream of Poole Powerhouse, Lee Vining Creek empties into Mono Lake, which is an inland sea that is over 700,000 years old and fills a natural basin of 695 square miles. The lake's salty water sustains trillions of brine shrimp, attracting millions of migratory birds to the area (MCC, n.d.).

The Mono Basin National Forest Scenic Area was designated in 1984 within the California Wilderness Act (Pub. L. No. 98-425, 98 Stat. 1619 [1984]) to protect the geologic, ecologic, and cultural resources within the 116,274-acre scenic area surrounding Mono Lake (USFS, 2019).

6.12.1.3. Wild and Scenic Rivers and Scenic Highways/Byways

As part of the wild and scenic rivers classification system, 4.13 miles of Lee Vining Creek are listed as scenic, with 1.63 listed as wild, and 8.98 as recreational (USFS, 2024). The 2019 Inyo National Forest LMP (USFS, 2019) also identified over 75 miles of river in the Mono Basin as eligible for inclusion in the National Wild and Scenic Rivers System, including all of Lee Vining Creek (Section 6.10, *Recreation*).

The Project is located along State Route 120, which runs west to east across the central part of California from Interstate 5 in the San Joaquin Valley near Lathrop through Yosemite National Park—where at 9,943 feet, it is the highest mountain pass (Tioga Pass) in California—to its end at U.S. Route 6 near Mono Lake. The 64 miles of State Route 120 running through Yosemite National Park has been designated as the Tioga Road / Big Oak Flat Road National Scenic Byway by the Federal Highway Administration (USDOT, n.d.). The 12 miles of State Route 120 extending from the eastern boundary of Yosemite National Park through the Project to U.S. Route 395, which runs north to south through the town of Lee Vining, has also been designated a National Forest Scenic Byway on February 8, 1990, and is commonly known as the Lee Vining Canyon Scenic Byway

(USDOT, n.d.). State Route 120 is typically closed in winter due to snowpack and inclement weather conditions (Cal Highways, 2024).

6.12.2. Visual Resource Assessment Study

As part of the LAND-2 Study, SCE conducted a desktop viewshed analysis to identify what portion and acreage of the Project lands and associated landscape would potentially be visually affected by Project-related features. The LAND-2 Final Technical Report (Volume III of this DLA). Eight Key Observation Points (KOPs) were selected in consultation with the Recreation and Land Use TWG in March 2023 (Figure 6.12-13).

At each KOP, views within specific distance zones (foreground, middleground, and background views), were evaluated, and representative photographs were taken to document the aesthetic character of the site. Viewing distances were generally characterized as:

- Immediate foreground/foreground—0 feet to approximately 0.5 mile;
- Middleground—approximately 0.5 mile to 4 miles; and
- Background—approximately 4 miles to horizon.

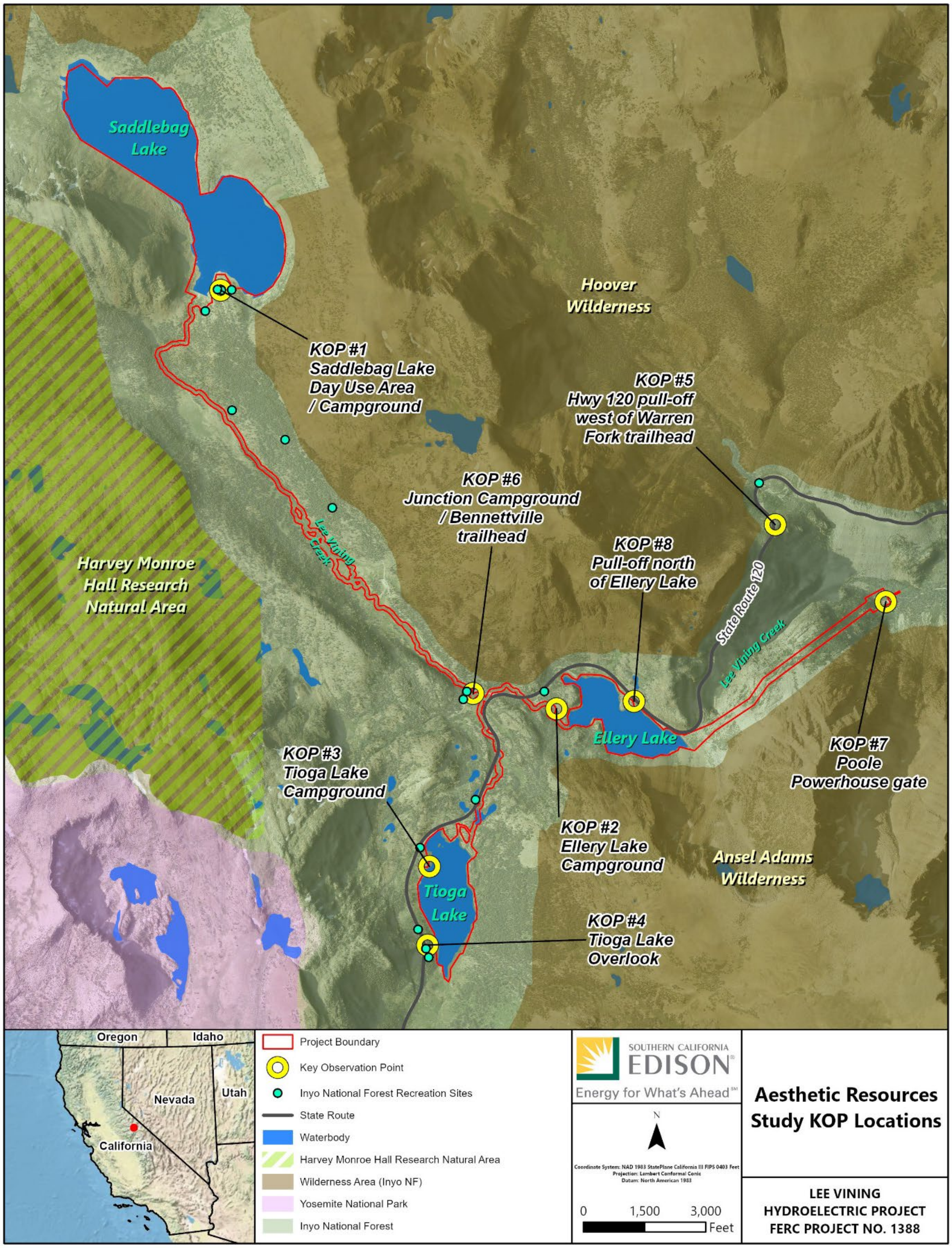


Figure 6.12-13. Aesthetic Resources Study and Key Observation Point Locations.

6.12.2.1. Key Observation Points Characterization

As part of the LAND-2 Study, SCE took 360-degree photographs from a lower, middle, and upper view at each of the eight KOPs on August 9 and 10, 2023. Rationale for selecting each of the eight KOPs is outlined in Table 6.12-1 followed by the descriptions and one image from each KOP; additional images and details are available in the LAND-2 Final Technical Report (Volume III of this DLA).

Table 6.12-1. Rationale for Key Observation Points

KOP	KOP Location	Rationale for Selection
KOP 1	Saddlebag Lake Day Use Area / Campground	High public use area, views of Saddlebag Lake and Dam
KOP 2	Ellery Lake Campground	High public use area, views of Ellery Lake and Rhinedollar Dam
KOP 3	Tioga Lake Campground	High public use area, views of Tioga Lake and Dam
KOP 4	Tioga Lake Overlook	High public use area, views of Tioga Lake and Dam
KOP 5	State Route 120 Pull-Off West of Warren Fork Trailhead	High public use thoroughfare, potential views of Ellery Lake, Rhinedollar Dam, and Poole Powerhouse
KOP 6	Junction Campground and Bennettville Trailhead	High public use area in the middle of the Project
KOP 7	Poole Powerhouse Gate	View of the powerhouse from the public access road
KOP 8	Pull-Off North of Ellery Lake	Industrial-looking area with old SCE cabin

KOP = Key Observation Point; SCE = Southern California Edison

KEY OBSERVATION POINT 1—SADDLEBAG LAKE DAY USE AREA / CAMPGROUND

Predominant views were found in the foreground, middleground, and background of the Saddlebag Lake Day Use Area / Campground (Figure 6.12-14). Development consists of the reservoir (Saddlebag Lake), Saddlebag Dam, an old USFS building, and a metal storage container. The area includes low rolling hills with semi-vegetated flat faces and terrain that are subtle brown color variations with little contrast and generally mute tones. The day use area provides more color variety with human-made structures such as vehicles and trailers. Vegetation includes trees in the foreground, with shrubs and more trees in the middleground. Viewing distances extend from foreground to middleground views.

Figure 6.12-14. Key Observation Point 1—Saddlebag Lake Day Use Area / Campground, View North.

KEY OBSERVATION POINT 2—ELLERY LAKE CAMPGROUND

Ellery Lake Campground, located on the western edge of Ellery Lake, was chosen as a KOP during consultation due to it being a high public use area and a location that provides views (Figure 6.12-15). Ellery Lake, State Route 120, and natural scenery of high and low ranges of rounded mountains and canyons are visible from the KOP location. Topography at KOP 2 includes soft, steep mountain slopes and the Lee Vining Creek inlet. Vegetation at KOP 2 is primarily sparse grasses, trees, and shrubs. The main visual feature is the inlet with bright green islands on the lake and rock outcroppings with sparse vegetation sprinkled with brown rocks and minimal grass, trees, and shrubs on the shoreline, providing unique feature views. Coniferous trees with some greenery and mixed curved and straight brown tree trunks line the non-vegetated areas. The inlet water is dark blue and semi-clear with dark brown and green shallow spots along the shoreline. Adjacent scenery has moderate overall visible quality with viewing distances being predominantly foreground to middleground.

Figure 6.12-15. Key Observation Point 2—Ellery Lake Campground, View East.

KEY OBSERVATION POINT 3—TIOGA LAKE CAMPGROUND

KOP 3 is located at the Tioga Lake Campground and was chosen due to high public use and views (Figure 6.12-16). It consists of level and open grassy areas with a view of Tioga Lake, mid-level mountains, and the Tioga Dam and Tioga Auxiliary Dam in the distance. Rounded rock outcrops are surrounded by semi-thick forest and a deep canyon beyond the dams. There is a green, grassy meadow on the south side of the lake with some variety of coniferous trees visible on the way up the mountain tops. Vegetation is sparse at the top of the mountains with white snow poking through brown and green soils through the mountains. Water visible from the KOP site includes Tioga Lake and the Glacier Creek inlet to the south. Additionally, the campground is within sight, which provides additional color contrast, as well as State Route 120 / Tioga Pass Road. Viewing distances are predominantly foreground to middleground and extend to background views.

Figure 6.12-16. Key Observation Point 3—Tioga Lake Campground, View Northeast.

KEY OBSERVATION POINT 4—TIOGA LAKE OVERLOOK

The Tioga Lake Overlook was selected due to it being a high-use public area with views of Tioga Lake, Tioga Lake Campground, dams, mountains, and forests (Figure 6.12-17). There are low meadows to the east with mountains and forest. The roadside's sheer face provides a unique geological feature, while vegetation consists of dense forest with low heights to sparse trees the higher the view up the mountain. There are meadows along the lake edge and wet areas to the east. Viewing distances are predominantly foreground to middleground and extend to background views.

Figure 6.12-17. Key Observation Point 4—Tioga Lake Overlook, View Northeast.

KEY OBSERVATION POINT 5—STATE ROUTE 120 PULL-OFF WEST OF WARREN FORK TRAILHEAD

The State Route 120 pull-off KOP is located west of the Warren Fork trailhead, where the powerhouse parking lot is visible. It was chosen by stakeholders due to its high public use thoroughfare and potential views of Ellery Lake, Rhinedollar Dam, and Poole Powerhouse. The views seen from KOP 5 include the highway, steep and long curved canyon walls and high mountain peaks, and Lee Vining Creek (Figure 6.12-18). Detailed features of mixed green forest, grasses, and shrubs in the canyons are dominant and exceptionally striking. The Rhinedollar Dam spillway can be seen from this site in the very far distance (northwest in photos) with a waterfall below the spillway. The cliffs are sheer and run along the highway with high and low vertical topography and an abundance of long-distance mountain views. The mountains have remnants of white snow, brown rocks, and soil mixed with bright green vegetation. Sparse bright green shrubs and trees grow along the canyon drainage. Parts of the Project facilities can be seen, including distribution lines and the substation. The transmission lines[12] running from Poole Powerhouse to the town of Lee Vining are also visible. There is a rock face along the roadside that blocks a far distance view. Viewing distances are primarily foreground and middleground and extend to background views.

Figure 6.12-18. Key Observation Point 5—State Route 120 Pull-Off West of Warren Fork, View East.

[12] The primary transmission line runs from the switchyard to Poole Powerhouse. The remaining length of transmission line to the town of Lee Vining was removed from the Project's license in 2001 (DLA Exhibit A).

KEY OBSERVATION POINT 6—JUNCTION CAMPGROUND AND BENNETTVILLE TRAILHEAD

KOP 6 at the Junction Campground and Bennettville Trailhead was chosen due to it being a high-use area in the middle of the Project Area with views of the campground entrance road, the Lee Vining Creek segment, and State Route 120 / Tioga Pass Road (Figure 6.12-19). Scenic views at KOP 6 includes rolling hills sloping southeast to northwest, mountains with gray and brown rock outcrops, lines of rich green coniferous vegetation, and bright white lines and chunks of snow melt. Open meadows are closer in view to the southeast with green grass and scattered trees immediately to the northwest. Some views provide more tightly packed mixed green tree populations, while the trees are further apart in other views, with green grass meadows between the forested landscapes. Lee Vining Creek is visible from this KOP, and a segment of Lee Vining Creek meanders through the site. Land use patterns and cultural features include the campground, a bridge, and State Route 120 / Tioga Pass Road. Viewing distances are predominantly foreground to middleground views.

Figure 6.12-19. Key Observation Point 6—Junction Campground and Bennettville Trailhead, View Southeast.

KEY OBSERVATION POINT 7—POOLE POWERHOUSE GATE

The Poole Powerhouse Gate at KOP 7 is located on the access road to Poole Powerhouse and substation. The powerhouse and substation are directly in face view at this KOP, which is why it was selected for the study. KOP 7 also includes views of the outlet to Lee Vining Creek, the tailrace, maintenance building, Triplex Cottage, transmission/distribution lines, and the substation (Figure 6.12-20). The natural landscape includes mountains, steep rock edges, and a variety of vegetative types. There is a sheer rock face behind the powerhouse with mixed tree species. Viewing distances are predominantly foreground views.

Figure 6.12-20. Key Observation Point 7—Poole Powerhouse Gate, View West.

KEY OBSERVATION POINT 8—PULL-OFF NORTH OF ELLERY LAKE

KOP 8 at the Ellery Lake pull-off was suggested by stakeholders because it is an industrial-looking area with an old SCE building, known as the "Operator's Cabin." Views include mountain peaks in the distant view and views of Ellery Lake (Figure 6.12-21). Project facilities in view include the Operator's Cabin, transmission/distribution poles and lines, and State Route 120 / Tioga Pass Road. The Operator's Cabin is wooden and provides an historic-looking feature. Natural diverse rock outcrops surround Ellery Lake with steep slopes, rocky terrain, and sheer mountain walls. The rock outcrops are mixed in color, ranging from red tones to brown to gray that slope into the lake bowl with white snow on the peaks. There are minimal green trees and shrubs in the lower canyon. Viewing distances are primarily foreground and middleground views.

Figure 6.12-21. Key Observation Point 8—Pull-Off North of Ellery Lake, View Northeast with Operator's Cabin.

6.12.2.2. Viewshed Analysis

A viewshed analysis was conducted in geographic information system (GIS) software to assess the visibility of each Project facility. The viewshed analysis was performed by analyzing the most current publicly available elevation data, which is a 10-meter digital elevation model published by the USGS 3DEP. Due to limited available vegetation type and height information, SCE did not consider vegetation (i.e., potential influence of vegetation and tree height screening of views) in the viewshed analysis and assumed an average individual's viewing height of 5 feet 5 inches; therefore, this would overall reflect a greater viewing distance and availability of views than would be expected under existing conditions with presence of vegetation. Further information on the viewshed analysis can be found in the LAND-2 Final Technical Report (Volume III of this DLA).

Based on the viewshed analysis, four Project facilities were determined to be visible from four KOPs:

1. Saddlebag Dam would be visible from KOP 1—Saddlebag Lake Day Use Area / Campground

2. Tioga Auxiliary Dam would be visible from KOP 3—Tioga Lake Campground and KOP 4—Tioga Lake Overlook

3. Tioga Dam would be visible from KOP 3—Tioga Lake Campground and KOP 4—Tioga Lake Overlook

4. Poole Powerhouse would be visible from KOP 7—Poole Powerhouse Gate.

Rhinedollar Dam is not visible from any KOP location (Table 6.12-2). All Project facilities are located in a USFS-designated "High" scenic integrity objective area, and a USFS-designated "Modified/Roaded" recreation opportunity spectrum area. Table 6.12-3 provides the area of land that each Project facility is visible from based on the viewshed assessment.

Table 6.12-2. Visual Resource Information by Facility for the Project

Project Facility	KOP Viewshed [a]	Scenic Integrity Objectives [b]	Recreation Opportunity Spectrum [b]
Poole Powerhouse	KOP 7	High	Modified/Roaded
Rhinedollar Dam	N/A	High	Modified/Roaded
Saddlebag Dam	KOP 1	High	Modified/Roaded
Tioga Auxiliary Dam	KOP 3, KOP 4	High	Modified/Roaded
Tioga Dam	KOP 3, KOP 4	High	Modified/Roaded

KOP = Key Observation Point; N/A = data not available
[a] Denotes facility visibility from KOP locations
[b] Source: USFS, 2019

Table 6.12-3. Extent of Visibility of Each Project Facility

Project Facility	Viewshed Area (Acres within FERC Project Boundary)	Viewshed Area (Acres within a 0.5-Mile Buffer of FERC Project Boundary)
Poole Powerhouse	6.2	415.3
Rhinedollar Dam	54.8	1,066.0
Saddlebag Dam	102.3	595.7
Tioga Auxiliary Dam	77.8	927.8
Tioga Dam	58.2	711.6

FERC = Federal Energy Regulatory Commission
Based on viewshed analysis using 10-meter digital elevation model, not including vegetation (i.e., potential influence of vegetation and tree height screening of view), and assuming a person viewing average standing height of 5 feet 5 inches

6.12.2.3. Existing Measures to Preserve or Enhance Visual Quality

Per Section 4(e) Conditions 4 and 6 of the Project License (FERC, 1997), the Project maintains reservoir levels and MIFs to preserve visual quality within the FERC Project Boundary. PME measures for the Project include the existing Visual Resource Protection Plan Section 4(e) Condition 11 (SCE, 1997), which is currently being implemented under the existing license. This plan outlines measures to preserve visual quality to be implemented for facility design and replacement, as well as guidance for transmission lines and roads and cleared areas.

6.12.3. Potential Adverse Effects and Issues

6.12.3.1. Effects of Project Operations and Maintenance Activities on Scenic Resources

Potential adverse visual effects associated with the Project O&M activities are limited to the industrial quality of the dams, powerhouse, and other associated facilities, which are subject to the existing Visual Resource Protection Plan.

NO ACTION

Under the No Action, the Project would continue to operate under the terms and conditions of the existing license. As such, no adverse effects on aesthetic resources are expected from the No Action.

PROPOSED ACTION

No changes in Project operations are proposed as part of the Proposed Action, and findings of the LAND-2 Study did not identify any significant effects relating to visual or aesthetic resources as a result of existing O&M activities; therefore, no effects relating to aesthetics are anticipated.

6.12.3.2. Consistency with the Inyo National Forest Land Management Plan

The Inyo National Forest LMP (USFS, 2019) provides a planning framework for the management of uses and resources associated with the Inyo National Forest (see Section 6.10, *Recreation*, and Section 6.11, *Land Use*, for more information). The USFS Land Management Planning Handbook (USFS, 2015) identifies scenic character as the combination of the physical, biological, and cultural images that gives an area its scenic identity and contributes to its sense of place. Scenic character provides a frame of reference from which to determine scenic attractiveness and measure scenic integrity. The Inyo National Forest LMP identifies desired conditions for scenic character (Section 6.11, *Land Use*) and scenic integrity objectives (desired conditions) for the management and preservation of scenic character within the Inyo National Forest.

SCE has reviewed the desired conditions in the Inyo National Forest LMP to assess whether the Project is consistent with management objectives. The desired conditions relating to aesthetic resources, with which the Project is consistent, include the following:

- SCEN-FW-DC 02: Scenic character is maintained and/or adapted to changing conditions to support ecological, social, and economic sustainability in the Inyo [National Forest] and in surrounding communities.

- SCEN-FW-DC 03: In places with distinctive scenic attractiveness[13] and in special places,[14] scenic integrity is maintained or improved to assure high quality viewing experiences. The Inyo National Forest's scenic resources complement the recreation

[13] Distinctive scenic attractiveness (or Class A) is defined in *Landscape Aesthetics: A Handbook for Scenery Management* (USFS, 1995) as "areas where landform, vegetation patterns, water characteristics, and cultural features combine to provide usual, unique, or outstanding scenic quality. These landscapes have strong positive attributes of variety, unity, vividness, mystery, intactness, order, harmony, uniqueness, pattern and balance."

[14] Special places are defined in *Landscape Aesthetics: A Handbook for Scenery Management* (USFS, 1995) as "locations in the landscape with unique importance and meaning. At times, special places are isolated, small areas or spots; at other times, they are large areas of land. Special places often have "place names" indicating local or regional significance. Special places may be merited strictly because of scenic attributes."

settings and experiences, as described by the range of scenery integrity objectives, while reflecting healthy and sustainable ecosystem conditions.

- MA-GRA-DC 02: Scenic integrity [in general recreation areas] is generally moderate to high. Where developed facilities are present, they are aesthetically incorporated into the landscape. Scenic integrity is maintained.

- MA-GRA-DC 03: Places for people seeking natural scenery and solitude are available in some areas. In other areas, motorized and nonmotorized recreation opportunities are easily accessed by roads, and visitors can expect encounters with others.

- MA-GRA-DC 05: A mosaic of vegetation conditions is often present, with some areas showing the effects of past management activities and other areas appearing predominantly natural.

- MA-EWSR-DC 01: Eligible or recommended wild and scenic rivers retain their free-flowing condition, water quality, and specific outstandingly remarkable values. Recommended preliminary classifications remain intact until further study is conducted or until designation by Congress.

As described in the Inyo National Forest LMP (USFS, 2019), scenic integrity objectives describe the minimum thresholds for the management of the scenery resource, ranging from very high to low scenic integrity objectives. Scenic integrity objectives describe the degree to which desired attributes of the scenic character are to remain and reflect changes in public perceptions and the importance of viewing scenery, as well as integrating scenery resources with the overall management of the landscape.

Figure 6.12-22 shows the scenic integrity classifications for the Project Vicinity. The USFS measures scenic integrity in five levels (USFS, 2019):

- **Very High:** This includes landscapes where the valued scenic character is intact with only minute, if any, deviations. The existing scenic character and sense of place is expressed at the highest possible level.

- **High:** This includes landscapes where the valued scenic character appears unaltered. Deviations may be present but must repeat the form, line, color, texture, and pattern common to the scenic character so completely and at such scale that they are not evident.

- **Medium:**[15] This includes landscapes where the valued scenic character appears slightly altered. Noticeable deviations must remain visually subordinate to the scenic character being viewed.

[15] The Inyo National Forest LMP defines this category as “Moderate,” though the GIS data for scenic integrity objectives associated with the LMP define this category as “Medium.” This category will be referred to as Medium.

- **Low:** This includes landscapes where the valued scenic character appears moderately altered. Deviations begin to dominate the valued scenic character being viewed, but they borrow valued attributes such as size, shape, edge effect, 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 complementary to the character within.

- **Very Low:**[16] This includes landscapes where the valued scenic character appears heavily altered. Deviations may strongly dominate the valued scenic character. They may not borrow from valued attributes such as size, shape, edge effect, 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 so that elements such as unnatural edges, roads, landings, and structures do not dominate the composition.

[16] While the Inyo National Forest LMP defines this category, there are no lands designated as "Very Low" in the GIS data for scenic integrity objectives associated with the LMP.

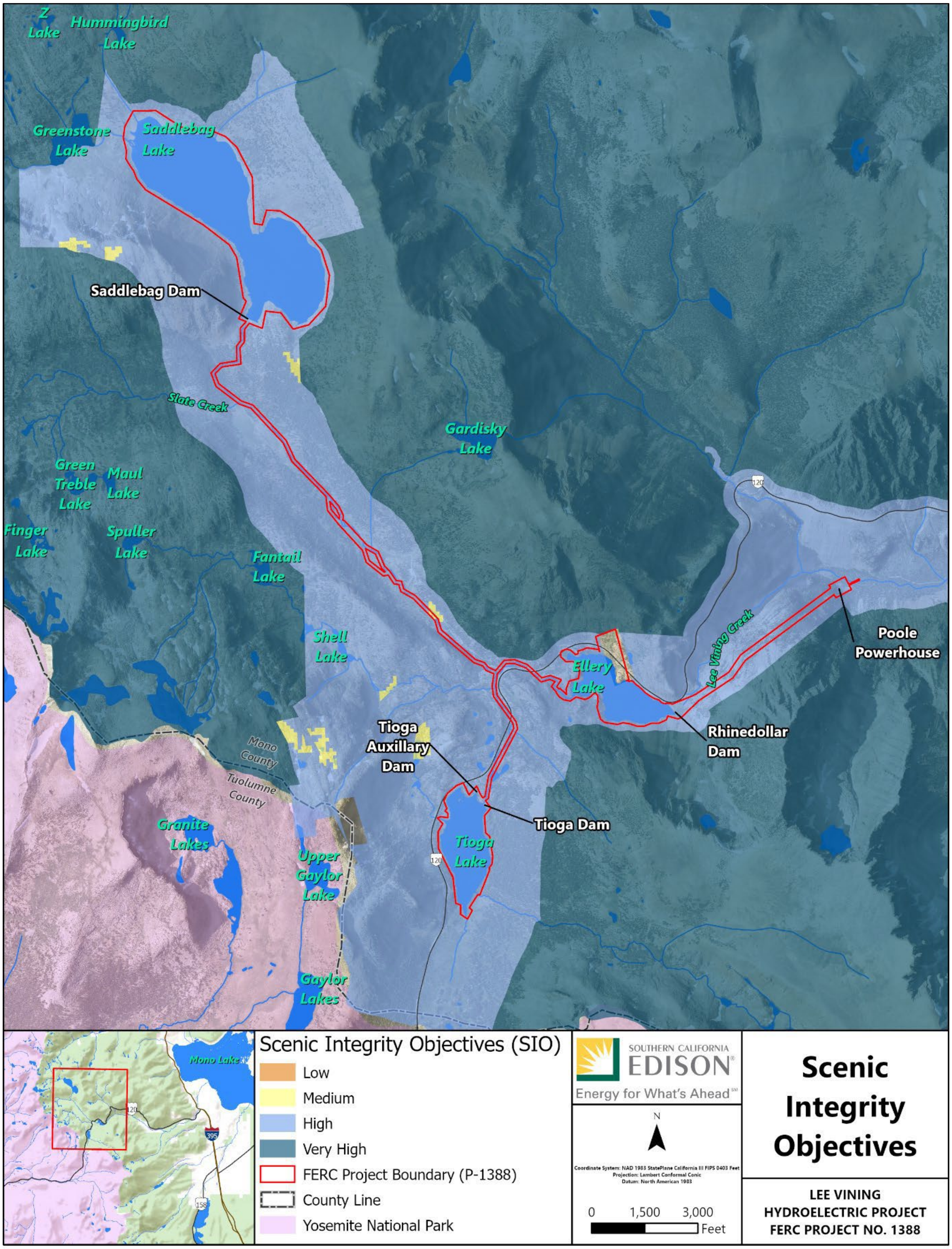


Figure 6.12-22. Inyo National Forest Land Management Plan Scenic Integrity Classifications for the Project Vicinity.

Recreation opportunity spectrums are designed to establish expectations and inform the management of settings when making decisions on facility and infrastructure design and development (USFS, 2019). The Inyo National Forest LMP recreation opportunity spectrum classifications are primarily Modified/Roaded, while both Primitive and Semi-Primitive Nonmotorized each account for less than 1 percent of Project lands.

6.12.3.3. Protection, Mitigation, and Enhancement Measures

SCE is proposing to maintain current O&M activities under the Proposed Action. Current MIF and reservoir levels will be maintained. Under the Proposed Action, the below PME measures and Management Plans would be implemented (Appendix E.1, *Protection, Mitigation, and Enhancement Measures*):

- PME-1: MIF requirements
- PME-2: Reservoir level requirements
- PME-4: Resource Management Plan

6.13. Cultural Resources

This section summarizes the results of the FERC-approved *Cultural Resources (CUL-1) Technical Study Plan* for FERC Project No. 1388, which included one study element covering the archaeology and built-environment resources (SCE, 2022). Because of the complexity of resource findings and the distinct nature of the two cultural resource types, study implementation included the development of two separate CUL-1 Draft Technical Reports: archaeology and built environment. The discussion here is intended to provide a basis for evaluating the potential issues summarized in the CUL-1 Draft Technical Reports, which are filed as confidential and privileged in Volume V of this DLA; Tribal resources are discussed separately in Section 6.14, *Tribal Resources*, of this Exhibit E.

This section was prepared to comply with Section 106 of the NHPA (16 USC § 470f) and its implementing regulations in 36 CFR Part 800, which requires that federal agencies to take into account the effects of their undertakings on historic properties and afford the Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment on such undertakings. The CUL-1 Draft Technical Reports were developed in collaboration with a Cultural and Tribal TWG, which includes representatives from FERC, the California SHPO, the Inyo National Forest, and Tribes and Tribal representatives identified by the Native American Heritage Commission and through SCE's Tribal outreach.

For the purposes of the CUL-1 Draft Technical Reports and as defined in the NHPA (54 USC § 300308), a **historic property** is any "prehistoric [precontact] or historic district, site, building, structure, or object included in, or eligible for inclusion on, the NRHP, including artifacts, records, and material remains related to such a property or resource." Following National Register Bulletin No. 36, *Guidelines for Evaluating and Registering Archaeological Properties* (NPS, 2020), an archaeological site is "a location that contains the physical evidence of past human behavior that allows for its interpretation." The term archaeological site refers to sites that are eligible for or are listed in the NRHP (historic properties), as well as those that do not qualify for listing in the NRHP. Unevaluated cultural resources are assumed eligible until determined otherwise.

A **district** is a geographic area containing a significant concentration, linkage, or continuity of sites, buildings, structures, or objects united historically or aesthetically by plan and physical development. Examples of districts include (but are not limited to) prehistoric archaeological site complexes, hydroelectric projects, residential areas, commercial zones, mining complexes, transportation networks, rural villages, canal systems, irrigation systems, or large ranches.

Cultural resource(s), for the purpose of this document, is used to discuss any precontact or historic-period district, archaeological site, building, structure, object, or landscape regardless of its NRHP eligibility.

6.13.1. Personnel Qualifications

The CUL-1 Study Plan and Draft Technical Reports were completed by individuals who meet the Secretary of the Interior (SOI) Professional Qualification Standards (PQS) in Archaeology and/or History and Architectural History (36 CFR Part 61) and are experienced at documenting historic properties in California. As well as hold the appropriate permits to conduct cultural resources work on lands managed by the Inyo National Forest.

6.13.2. Area of Potential Effect and Study Area

A project's APE is defined in 36 CFR Part 800.16(d) as "the geographic area or areas within which an undertaking may directly or indirectly cause alterations to the character of use of historic properties, if any such properties exist." SCE defined the APE for the Project as all lands within the FERC Project Boundary (Figure 6.13-1) and the Study Area as a 0.5-mile radius of the APE. During the 2022 preparation for fieldwork, it was evident that the existing FERC Project Boundary, as mapped, did not match the text description of said boundary in the vicinity of the free-flowing portions of Lee Vining Creek. The boundary was corrected in the GIS data in advance of the fieldwork. In a letter dated March 23, 2022, the SHPO pursuant to 36 CFR § 800.4(a)(1) found the APE as defined to be sufficient for the undertaking (Polanco 2022; SHPO Ref No. FERC_2022_0112_001).

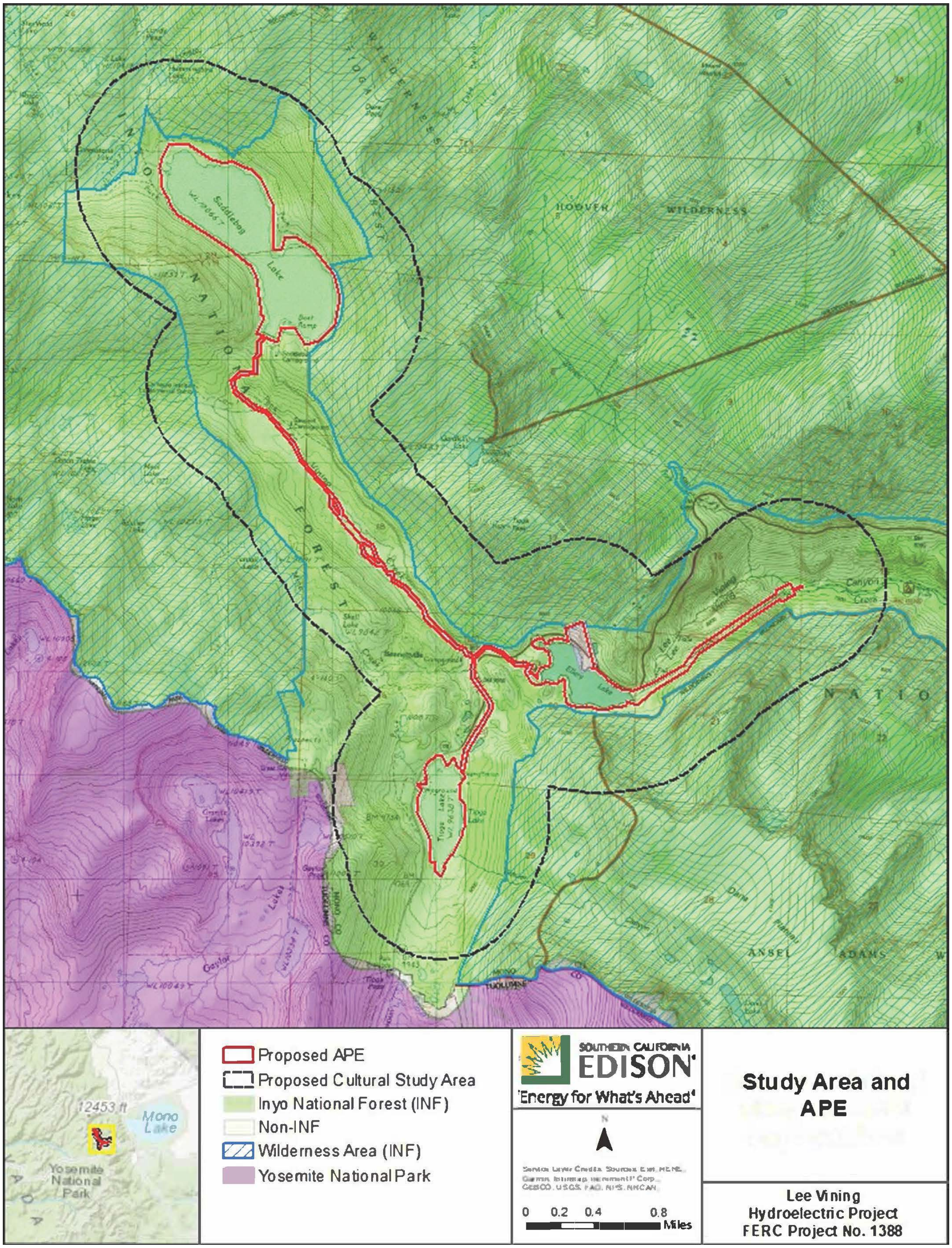


Figure 6.13-1. Lee Vining Project Study Area and Area of Potential Effects.

6.13.3. Study Objective

The cultural resource study objectives as determined in the CUL-1 Study Plan (SCE, 2022) include the following:

- Meet FERC compliance requirements under in its regulations (18 CFR Part 5) and Section 106 of the NHPA, as amended, by determining if Project-related activities and public access will have an adverse effect on historic properties.
- Identify all archaeological resources, built-environment resources, and Tribal cultural resources within the APE, determine which are historic properties, and develop the HPMP based on those results.
- Ensure that future Project facilities and operations are consistent with the desired conditions described in the *Land Management Plan for the Inyo National Forest* (USFS, 2019) for Social and Economic Sustainability and Multiple Uses.

The archaeology and built-environment CUL-1 Draft Technical Reports serve to fulfill the objective of identifying all archaeology and built-environment resources within the APE and evaluating which are historic properties. Furthermore, it assesses whether Project-related activities and public access may have an adverse effect on the historic properties. The final objective, ensuring that Project facilities and operations are consistent with the desired conditions described in the *Land Management Plan for the Inyo National Forest* (USFS, 2019), will be incorporated into the HPMP for the Project.

6.13.4. Environmental and Cultural Context

6.13.4.1. Physical Environment and Climate

The Sierra Nevada forms an abrupt orographic boundary focusing significant precipitation on its mountainous western slopes. The crest blocks precipitation from reaching the enclosed basins beyond the eastern escarpment, producing an abrupt moisture dichotomy between the generally mesic, subalpine habitats of the tarn lakes and floodplain meadows of the Project Area, and the xeric sagebrush steppe and local riparian corridors of the Great Basin immediately to the east. Up to 125 centimeters of precipitation (water content) can fall along the crest annually, enlarging the winter snowpack at Tioga Pass and Lundy Pass, while the Mono Basin only a few miles east receives about 13 centimeters per year (Hodelka et al., 2020; Montague, 2010). At the Tuolumne Meadows (Montague, 2010) just west of the Project Area, maximum temperature in summer averages 21.7°C (71°F), with a minimum winter average of 2.6°C (37°F). The average winter maximum reaches 5.2°C (41°F), with chilling low averages of -13.0°C (8.6°F) annually. The high-altitude cold and significant winter precipitation supports a deep snowpack whose moisture is released slowly, supporting meadows and riparian habitats on both sides of the crest well into the summer.

The orographic effect also influenced past climate along the crest. The Project Area was fully glaciated during the Late Pleistocene with deep, scouring glaciers extending from the summits, burying and ultimately shaping the landforms of the Project Area. With glacial retreat culminating between 18,000 and 16,000 years ago, pluvial Lake Russell reached highstand (Ali, 2018; Hodelka et al., 2020). The lake record shows several high-amplitude fluctuations on either side of the Pleistocene–Holocene transition about 12,600 years ago, suggesting shifts in wet storms systems, pulses of glacial expansion locking up moisture, and glacial retreat providing surface water to the streams and basin lake. The Early Holocene was drier and colder than today; sagebrush and grass pollen appears in the Early Holocene (earliest) section of a pollen core at Tioga Pass Lake (Spaulding, 1999). Cooler and wetter conditions with brief forest expansions arrive in the high country by about 6,000 calendar years (cal) Before Present (BP). Subalpine forest, the woodland pattern present today, was established about 2,500 years ago with expansions and contractions due to drought and climate punctuating the Late Holocene. Extreme drought is evident during the Medieval Climate Anomaly (Stine, 1994; Mensing et al., 2008). Although the mountain received winter moisture, it was not enough to support tarn lakes, and flashy stream and groundwater discharge depleted earlier in each season. Drowned trees in Tenaya Lake (Stine, 1994) downstream to the west from Tioga Pass record the diminished surface water during the Medieval Climate Anomaly. The drought was long enough for woodlands to occupy the lake basins, unless there were other changes (tectonics, landslides) that altered the drainage and pool levels.

About 600 years ago, the Little Ice Age may have resulted in reactivated glaciers due to increased orographic winter precipitation. The Little Ice Age glacial advance was confined to cirques (Gillespie and Zehfuss, 2004), and although the Project Area remained free of glaciers, it seems likely that snow depths were significant and may have been year-round. This may have affected recent patterns of resource productivity and access to the passes and corridors of the Sierra-Cascade Crest just prior to European contact and the resulting dramatic changes in ethnohistoric land use surrounding Tioga Pass.

6.13.4.2. Geomorphological Context

Formed beneath the deep glaciers of Tioga Pass, the landscape of the Project Area is a product of the Late Pleistocene glaciation of the Sierra-Cascade Crest. Glaciers extending from the cirques of Glacier Canyon below the northern escarpment of Mount Dana (13,057 feet amsl) coalesced with a glacial mass extending from upper reach of Lee Vining Canyon, Lundy Pass, and the eastern cirques of White Mountain (12,057 feet amsl) and Mount Conness (12,590 feet amsl). While the gravity of the western slope and the Grand Canyon of the Tuolumne pulled the Dana glacier westward, the Lee Vining glacier dropped eastward into the Great Basin, carving a dramatic canyon of its own as it extended toward the basin of Mono Lake and pluvial Lake Russell.

The bedrock of Tioga Pass and Lee Vining Canyon consists of granodiorite rocks of the Tuolumne Intrusive Suite (Coleman et al., 2004), and plutonic rocks that surround and intrude remnants of metasedimentary and metavolcanics rocks (Hodelka et al., 2020). While generally gray plutonic rocks encompass the Project Area, darker brown metavolcanics outcrop prominently in places, such as at Ellery Lake. The Pleistocene glaciers scoured the bedrock exposing patchy rock surfaces surrounded by rubble of canyon colluvium, irregular ground moraines, and well-formed lateral moraines.

With the retreat of glaciers in the Terminal Pleistocene and Early Holocene, extreme surface flow continued scouring the once-glaciated terrain. Pluvial Lake Russell in the basin of Mono Lake reached its highstand during the period of glacial retreat (Ali, 2018) and high meltwater drainage into Lee Vining Canyon. Eventually streams turned into narrow floodplains and linear riparian habitats formed as drainages sought equilibrium in the scoured landscape. Tarn lakes, formed in minor cirques and in ground moraine catchments, are common near Tioga Pass and in the upper reach of Lee Vining Canyon. The developed reservoirs at Saddlebag Lake, Tioga Lake, and Ellery Lake augmented existing tarn basins in low-gradient steps below Tioga Pass and below Lundy Pass. Today, local drainages are generally steep, relatively straight channels with pools and riffles leading to dropping falls. The upper reach of Lee Vining Creek, however, has evolved into a meandering channel with a broad wetland floodplain between steep confining slopes. The floodplain shows distributary meanders and oxbows along a channel subject to high seasonal fluctuations due to local run-off, although the controlled output at Saddlebag Lake attenuates a portion of the natural seasonal dynamics. Where there is evidence of long-term floodplain stability, shown by relatively well-developed soils and an absence of recent channeling, the floodplain deposits have potential for preserving an intact, buried archaeological record. The Project Area is generally confined to this floodplain throughout the upper reaches of Lee Vining Creek.

Soils forming on the formerly glaciated landscape are Holocene-age profiles, typically part of the Stecum-Charcol series. These immature profiles are A-C horizons on young landforms of moraines, floodplains, and minor alluvial fans. The profiles are generally thin and shallow on local plutonic (i.e., granitic) bedrock (e.g., grus, till, or small floodplain meadows), but parent material on metamorphic rocks can show significant organic content with relatively mature development (A-Bt-C horizons) for a soil of relatively recent age (i.e., forming since deglaciation). The metamorphic parents can also act as groundwater reservoirs supporting meadow vegetation and complex biotic communities (Cooper et al., 2006). In general, however, soils and sedimentary parent material throughout the Project Area form a shallow veneer on local bedrock with deepest profiles in floodplain meadows. Where present, archaeological resources are likely to have surface manifestations even where shallowly buried deposits of young landforms exist.

6.13.4.3. Flora and Fauna

This section has been adapted from Davis-King and Snyder (2010), Montague (2010), and Stevens and Lenzi (2015). The Project Area lies at the western margin of the Basin and Range Province, a region defined as semidesert due to the rain shadow effect of the adjacent Sierra Nevada. However, semidesert conditions are ameliorated by significant winter precipitation and spring run-off in high elevations common to the Project Area. Subalpine habitat and lodgepole pine (*Pinus contorta)* community flourishes adjacent to seasonally flooded riparian meadows. The subalpine areas dominant throughout much of the Project Area transition eastward to streamside riparian habitats in Lee Vining Canyon.

Subalpine communities occur between approximately 8,000 and 9,500 feet and are characterized by conifer forests often dominated by lodgepole pine (*Pinus contorta*), as mentioned, but also featuring Jeffrey pine (*Pinus jeffreyi*), white fir (*Abies concolor*), and occasional limber pine (*Pinus flexilis*) and whitebark pine (*Pinus albicaulis*). Wet meadows in subalpine habitats harbor root plants, especially various wild onion (*Allium* sp.) varieties, lupine (*Lupinus latifolius*), grasses, and sedges; the variety of useful plants available seasonally in well-watered areas of subalpine habitats is significant for Native people. Willows (*Salix* sp.) and cottonwood/aspen (*Populus* sp.) communities, along with the occasional pinyon pine (*Pinus monophylla*), occupy the rock-bounded linear corridor of the lower Project Area along Lee Vining Canyon.

Fauna within these communities consist primarily of various mammals and migratory birds. Common summer residents of the subalpine zone include the mountain bluebird (*Sialia currucoides*), Clark's nutcracker (*Nucifraga columbiana*), gray-crowned rosy finch (*Leucosticte tephrocotis*), and white-crowned sparrow (*Zonotrichia leucophrys*). A variety of mammals are found within these communities at various times of the year; these include the yellow-bellied marmot (*Marmota flaviiventris*), Nuttall's cottontail (*Sylvilagus nuttallii*), mule deer (*Odocoileus hemionus*), coyote (*Canis latrans*), badger (*Taxidea taxus*), black bear (*Ursus americanus*), and possibly grizzly bear (*Ursus arctos horribilis*) (Montague, 2010). Mountain sheep (*Ovis canadensis*) would have also been present in the higher elevations historically. Rodents are particularly prevalent in higher elevations and of importance to Native Americans.

6.13.4.4. Precontact Setting of the Project Vicinity

The following discussion provides a generalized review of the adaptations of the prehistoric populations in the Mono Lake region as viewed through the lens of archaeological research presented by Montague's synthesis (2010) of the archaeology of the Tuolumne River watershed, testing results from Stevens et al. (2015) at the nearby Mountain Warfare Training Center, Rosenthal's synthesis (2012) of the archaeology of Crane Flat, and recent work by Clay and King (2019) in the Bodie Hills. Following their lead and other archaeologists who have worked in this part of Mono County (e.g., Basgall, 1998; Bettinger, 1981; Bieling, 1992; Fredrickson, 1991, 1998; Giambastiani, 1998; Halford, 1998, 2008; Noble, 1992; Overly, 2002, 2004), the precontact setting is divided into three temporal intervals: Early Holocene (pre-8200 cal BP), Middle Holocene (8200–3400 cal BP), and Late Holocene (3400–600 cal BP). For the Great Basin, the Late Holocene is subdivided into Newberry (3400–1300 cal BP), Haiwee (1300–600 cal BP), and Marana (600–150 cal BP), representing broad adaptive shifts in settlement location and artifact assemblages. The Great Basin sequence is based on decades of detailed archaeological studies from the Mono Basin and on broader archaeological research trends found within the larger western Great Basin region. The Great Basin sequence refers to time periods that are defined on the basis of hundreds of radiocarbon dates and changes in distinctive projectile point types (e.g., Thomas, 1981) and are widely accepted as temporally useful.

EARLY HOLOCENE (PRE-8200 CAL BP)

Evidence of Early Holocene occupation in the Mono Basin is relatively sparse, represented by a few widely dispersed sites (Basgall, 1987, 1988; Hall, 1990). These early occupations of the region are typically identified by the presence of Great Basin

Stemmed or fluted/concave-based projectile points, Pinto-series projectile points, and large percussion-flaked "greenstone" bifaces. These assemblages reflect a high degree of residential mobility with high percentages of debitage from local toolstone sources such as the Casa Diablo or Bodie Hills obsidian sources (Halford, 2001, 2008), but with formal tools made from distant, non-local sources (Basgall, 1989, 1991; Delacorte, 1999). Based on the near absence of milling equipment, there appears to be minimal use of seed resources among the population at this time. Instead, Early Holocene diets likely relied on hunting large and small game animals, the latter of which are particularly prevalent in the more arid parts of the region (Elston et al., 2014; Hall, 1990).

MIDDLE HOLOCENE (8200–3400 CAL BP)

The Middle Holocene (also referred to as the Little Lake Period by Bettinger and Taylor, 1974) is marked by the continued use of Pinto-series points (Basgall and McGuire, 1988; Delacorte et al., 1995; Gilreath, 1995; Hall, 1980; Jackson, 1985; Jenkins and Warren, 1984; Peak, 1975). The period overlaps the Early Martis period (5,000–3,000 cal BP) of the Sierra chronology. In the Inyo-Mono region, there is a noticeable gap in components dating to this interval (Basgall, 2009), although use of the Bodie Hills obsidian quarry continues (Halford, 2001, 2008). Middle Holocene assemblages are quite similar to those of the Early Holocene in respect to patterns of toolstone acquisition and use, mobility, and hunting adaptations. They differ by showing an increase in the frequency of milling equipment, a shift probably reflecting a broadening diet breadth in response to increased aridity and reduced environmental productivity (Antevs, 1948; Warren and Crabtree, 1986).

NEWBERRY PERIOD (3400–1300 CAL BP)

Precontact populations continued to use highly mobile settlement systems during the Newberry Period, but the range of such systems appears to have contracted, becoming regularized within seasonal movements. Another important aspect of the Newberry Period is the trans-Sierra exchange of obsidian. Obsidian transport and exchange appears to have reached its peak during this interval (Rosenthal, 2012). The expansion of this system is indicated by an increase in quarry production and biface manufacture at several western Great Basin sources including Bodie Hills, Mono Lake, and Casa Diablo. The pattern is mirrored by a peak in obsidian hydration frequencies from these sources at sites in the western Sierra Nevada. Sourcing at these sites indicates that obsidian primarily was transferred in an east-west direction, with the distribution of obsidian from these sources demarcated by watershed boundaries that would have made north-south travel more difficult (Davis-King and Snyder, 2010; Montague, 1996; Rosenthal, 2012).

It has been hypothesized that the peak in trans-Sierra obsidian conveyance was due to the more regularized settlement patterns that emerged during this interval that allowed for more predictable interaction among neighboring populations (Basgall, 1983; Ericson, 1982; Gilreath and Hildebrandt, 1997, 2011; Goldberg et al., 1990; Hall, 1983; King et al., 2011). Regular, trans-Sierra travel of people on both flanks of the mountain range is supported by the clustering of sites along east-west travel corridors leading from the Summit/Virginia, Tioga/Mono/Parker, and Donohue passes. Of these, Mono Trail, passing through Bloody Canyon, Mono Pass, and Tuolumne Meadows, provided the easiest route between Yosemite Valley and Mono Lake (Montague, 2010).

HAIWEE PERIOD (1300–600 CAL BP)

The Haiwee Period is marked by the adoption of the bow and arrow in the Sierra Nevada and southwest Great Basin. Archaeologically, this shift in technology is identified by the presence of Rose Spring projectile points in assemblages. In addition to this major technological change, it appears that a restructuring of local subsistence-settlement systems also occurred. Excavations throughout the region indicate the emergence of permanent or semi-permanent lowland villages characterized by residential structures, bedrock milling features, extensive assemblages of flaked and ground stone tools, and a diverse set of floral and faunal remains. Such residences were probably supported by more temporary upland pinyon camps and centralized seed production stations in the valley bottoms (Basgall and McGuire, 1988; Bettinger, 1989). In higher elevation settings near the Sierra-Cascade Crest, sites from this period are more likely to contain bedrock milling stations, features, ground stone, and midden deposits, suggesting more intensive use of montane environments (Montague, 2010). The relationships between these sites indicate that seasonal transhumance had become more spatially confined, resulting in more intensive use of less profitable resources within progressively smaller foraging areas. Reduced residential mobility is also indicated by decreased flaked stone material diversity, a more even balance between tool and debitage material types, and greater use of expedient, non-curated milling equipment (Basgall, 1989; Basgall and Giambastiani, 1995; Basgall and McGuire, 1988; Bettinger, 1989, 1999a, 1999b; Bettinger and Baumhoff, 1982; Delacorte, 1990; Delacorte and McGuire, 1993).

Accompanying these decreases in settlement mobility and likely higher degrees of territoriality was a collapse of interregional obsidian exchange (Bettinger, 1977, 1982; Bettinger and King, 1971; Gilreath and Hildebrandt, 1997). Production and exchange of Great Basin obsidians over the Sierra Nevada appears to have declined significantly as indicated by hydration frequencies at both western Sierra sites and the quarries themselves (Rosenthal, 2012). The collapse of these production-exchange systems has been attributed to a variety of factors, the most likely being increased territoriality and technological change. With respect to increased territoriality, it has been argued that prior to the Haiwee Period, there was a relatively high demand for obsidian and few constraints inhibiting its acquisition (Gilreath and Hildebrandt, 1997). Later in time, decreased mobility accompanied by increased population density and territoriality restricted free movement across the landscape, inhibiting the distribution of obsidian and other trade goods over large distances. The decline of trans-Sierra obsidian exchange can also be attributed to decreasing demand for obsidian due to changes in flaked stone technology (i.e., reduced need for toolstone with small arrow points made on debitage instead of bifaces), reducing the overall importance of the toolstone (Basgall and Giambastiani, 1995; Gilreath and Hildebrandt, 1997; Goldberg et al., 1990).

MARANA PERIOD (600–150 CAL BP)

Key indicators of the Marana interval include Cottonwood and Desert Side-notched projectile points. Many of the trends established in the Haiwee continued forward during this interval, including the more intensive use of local environments, particularly increased use of riparian and lacustrine settings (to obtain flies, shrimp, shellfish, waterfowl, and tule seeds), pine nuts in the intermediate zones, and a variety of root crops and small mammals in the subalpine zones of the Sierra Nevada. This intensification can likely be attributed to large, dense populations, as evidenced in the Sierra by well-developed midden deposits dating to this period (Moratto, 1999).

ARCHAEOLOGICAL INVESTIGATIONS

Archaeological investigations of precontact sites in the Study Area vicinity have been relatively few compared to neighboring regions such as Owens Valley and the lower elevations of the western Sierra. Among the first well-documented excavations in the region is Bettinger's (1981) investigation at the Lee Vining site (CA-MNO-446) near the mouth of Lee Vining Canyon. Projectile points and source-specific hydration suggested a long span of occupation, with intensive use beginning in the Newberry Period. Bettinger characterized the later-dating deposits as the remains of a summer residential base. An obsidian cache was found, with large biface blanks apparently intended for trade. Geochemical sourcing revealed a marked shift in the profile of obsidian sources used over time, with Casa Diablo dominating earlier deposits and a wider variety of more-local sources represented in later deposits.

York (1990) conducted limited test excavations in the immediate Project Area in support of a previous relicensing of the Lee Vining Project, as well as in the nearby Rush Creek and Lundy Hydroelectric Project areas—all in generally similar settings in the canyons of the eastern Sierra scarp. The tested precontact sites, which York generally characterizes as temporary camps, displayed a limited range of flaked and ground stone artifacts. Projectile point types and obsidian hydration measurements suggested occupations ranging from the Newberry through Marana Periods; geochemical sourcing revealed the use of a wide variety of east-side obsidian sources dominated by Casa Diablo and Mono Glass Mountain.

Wickstrom and Jackson (1993) and McGuire (1994) reported on test excavations at a series of sites along the Rush Creek Four-Lane Project area, extending several miles south along the U.S. Route 395 corridor from the mouth of Lee Vining Canyon. Carpenter (2001) later conducted data-recovery investigations at two of these sites. The precontact sites investigated during this project were generally sparse, shallow deposits indicative of temporary camps or task-specific areas, again with diverse obsidian source profiles dominated by Mono Glass Mountain and Mono Craters and dating primarily to the Haiwee and Marana Periods. The exception was the more substantial multi-locus deposit at MNO-891 on Rush Creek, which contained a Newberry-period component dominated by Casa Diablo obsidian, and which still represents one of the few documented substantial residential sites on the western rim of the Mono Basin. This finding of a shift from a Newberry-period focus on Casa Diablo obsidian and other major sources to a later focus on a wider range of locally available obsidian sources echoes Bettinger's (1981) earlier finding and has been repeated in many investigations in the Inyo-Mono region. This wholesale shift in patterns of toolstone acquisition may be the result of (1) a collapse in trade networks at the beginning of the Haiwee Period, (2) increasing territorial circumscription, or (3) some combination of the two.

Surveys in the pinyon belt on the northern rim of the Mono Basin (Clay and King, 2019; Eerkens and King, 2002) have revealed hundreds of small rock rings in association with pinyon poles and other signs of intensive Marana-period use of this important resource; the rings likely represent the remains of dismantled green-cone caches. Also, near the eastern shore of Mono Lake, the complex of v-wing antelope traps documented by Arkush (1995) records another important archaeological signature of Mono Basin Paiute subsistence practices.

A substantial amount of archaeological work has also taken place in the upper elevations of Yosemite National Park immediately west of the Project Area, most notably the testing work in Dana Meadows by Montague (1996) and Hull et al. (1995). Similar to sites on the eastern slope, most of these sites were dominated by flaked stone debris with smaller quantities of ground stone artifacts, bedrock milling features, and features such as hearths. Obsidian from Inyo-Mono sources was the overwhelmingly dominant material, as it is throughout much of the park.

6.13.4.5. Ethnographic Context of the Project Vicinity

Prior to non-native people entering the region, it was occupied by and in the traditional territory of a Northern Paiute group, the Kutzadika^{a} (Kootzaduka'a). The term Kutzadika^{a} (Kootzaduka'a) derives from the Northern Paiute word, *kutsavi,* for the alkali fly (*Ephydra hians*), a greatly prized food by the people of Mono Lake. The Kutzadika^{a} (Kootzaduka'a) harvested the pupae of the fly, which they made into a soup and used for trade items elsewhere. This summer food was supplemented by pinyon pine nuts gathered in the autumn, acorn, and the Pandora moth larvae along with other vegetable and animal foods. The people traveled widely, from Walker Lake in Nevada to Yosemite Valley in Mariposa County, and up and down the eastern Sierra Nevada piedmont. They had alternately friendly and unfriendly relations with their neighbors the Miwuk to the west, the Me-Wuk to the northwest, and the Washoe to the north. Abutting their territory to the northeast, east and southeast were other Shoshonean groups of Northern Paiute and Western Shoshone.

Kutzadika^{a} (Kootzaduka'a) territory occupies the western Basin and Range Provence, but summer activities take place in the Sierran Biotic Province, which provides diverse biotic communities encompassing five belts. Their terrain has an elevation span from about 6,500 feet amsl at Mono Lake to more than 13,000 feet amsl at Mount Dana. Much of the territory had abundant water, supplied by the perennial Lee Vining Creek and Glacier Canyon in particular, while there are many tarns, springs, creeks, and meadows with typical Sierra Nevada temperatures of cold, wet months in the winter and very hot and dry months in the summer. This varied landscape provided a diversity of edible, material, medicinal, and other resources for the people.

The Northern Paiute are a geographically widespread linguistic group that extends from an area just south of Mono Lake, north to Goose Lake into Oregon and Idaho, and west to the Little Humboldt and Reese Rivers. This vast area included numerous groups connected by language but somewhat diverse in culture due in part to the varied environment in which they lived. Although there were some early investigations by Stephen Powers in the mid-1870s and Wesley Powell in 1880, C. Hart Merriam appears to be the first to talk with people who had experienced the first non-natives' arrival. Willard Park investigated the people in the 1930s, and Emma Lou Davis prepared the first ethnographic overview of the Project Area people in 1965. Section 6.14, *Tribal Resources*, in Exhibit E provides additional background and citations.

Merriam observed that the people easily moved between the Great Basin and the Sierra Nevada, especially into what became Yosemite National Park. John Muir also observed the lifeways of the Kutzadika[a] (Kootzaduka'a)and there are several early non-anthropological documents relating to the people going to the western Sierra to collect or trade for black oak acorn. A seasonal round was part of normal life for the Kutzadika[a] (Kootzaduka'a), who often wintered at Walker Lake due to milder conditions and spent summers in Yosemite Valley, finding the Lee Vining area good for spring and autumn activities. Small familial groups were the most common form of social gatherings throughout the year, although communal hunting for animals such as pronghorn or rabbits was common. People traveled freely and frequently, thus making transportation corridors a principal resource type. Small camps, often with one or two residences or brush shelters, are frequently noted, along with pine nut camps, medicine gathering areas, water modification features, and a few other site types. Around Mono Lake, Emma Lou Davis (1965) observed that the Kutzadika[a] (Kootzaduka'a)used "almost every square mile of open country [which] was visited and now shows a telltale flake or two of obsidian. These can be called use areas. There are other places, perennially favored as camps, where chipping waste lies thick. These can be referred to as occupancy areas."

Material culture largely reflects subsistence and residence patterns, with milling slabs and less frequent rock mortars indicative of seed and nut processing; tools reflecting scraping, cutting, and smoothing of items; possibly imported Owens Valley Brownware; and stone tools made of local materials (Bodie Hills being in their territory); as well as imported or gathered obsidian. Basketry was functional but especially in the early 20th century became such an elevated art that the Mono Lake weavers such as Lucy Telles, Carrie Bethel, and Tina Charley are among the more revered Indian basket makers in the world. Both twined and coiled varieties are found in several functional types and dimensions.

Ethnohistorically, the Northern Paiute began to see changes to their environment and encounters by outsiders as early as 1800, if not before. The horse, for example, had been introduced into the American southwest and Plains in the 1700s, with Northern Paiute groups accepting the animal and becoming much more nomadic in search of bison. There was a great ecological factor for horse acceptance in that it allowed equestrians to travel long distances to acquire food and other items to bring back to a more central location. Another important factor was the westward encroachment of various groups including Hispanic explorers, French and other fur trappers, and settlers of many affiliations. Both

Washo and Paiute oral histories have stories about the Spanish “conquistadors” and men wearing silver plates coming into their territory in search of precious metals.

In 1827, Jedediah Smith, on his journey west from California east to the Great Salt Lake, encountered 20 to 30 presumably Paiute men on horses at Walker Lake, along with numerous other groups who had horses or with whom he exchanged horses for supplies. By 1850, the rush for riches in California and western Nevada particularly affected the lifestyle and environment of the people, and the story of what happened to the westernmost Northern Paiute is similar to that of other people affected by Euro-American expansion across the U.S. Also, by this time, non-native items of metal, glass, and ceramics had found a place in Paiute material culture. Several documents about Mono County Native American history include detailed accounts of Kutzadika[a] (Kootzaduka’a) Paiute interaction with the newcomers. Some 50,000 head of livestock, 21,000 people, and 6,200 wagons passed through Northern Paiute territory on their way to California. It does not take much imagination to visualize how this might have affected the environment and lifeways of the Northern Paiute. Seed plants eaten, trampled, and destroyed; water fouled; game either shot or chased away, leaving little upon which the Kutzadika[a] (Kootzaduka’a) could survive. The transition into the government period of overseeing Indians had begun, moving into a reservation period for some Native Americans and a period of neglect for others, like the Kutzadika[a] (Kootzaduka’a).There is also an important story about the integration of the Kutzadika[a] (Kootzaduka’a)into the labor force of the area, even including employment on construction and maintenance of the Project.

6.13.4.6. Historic-Period Context of the Project Vicinity

The following section provides a historic context of the Project and surrounding area, which includes the following main themes: early exploration and mining, logging, agriculture and ranching, transportation, hydroelectric development, and recreation.

EARLY EXPLORATION AND MINING

Although the exact route is unknown, it has been surmised that exploration of Mono County by non-native people began in the early 1800s when trappers Jedediah Strong Smith, Robert Evans, and Silas Goble may have crossed Sonora Pass on their journey to the Great Salt Lake in 1827. In 1834 Joseph Reddeford Walker, leading an expedition of 40 soldiers, followed the East Walker River through Mono County on their way to what would later become California’s San Joaquin Valley. Other parties passed through the county in the 1840s, including Lieutenant John C. Fremont and the Bartleson-Bidwell Party (Chappell, 1947:235; Trexler, 1980:1).

As with much of the Sierra Nevada, non-native settlement in Mono County began after California became a state and gold was discovered at Colma in the early 1850s. In 1852, specimens of gold-bearing quartz were discovered while Lieutenant Tredwell Moore and his detachment were chasing Chief Tenaya and a band of “Yosemite Indians” through Mono Pass. The specimens were displayed in Mariposa, and as a result the lure of gold inspired Leroy “Lee” Vining and others to come to the area and establish themselves on what became known as Vining's Gulch or Creek (now Lee Vining Creek). While there is no evidence that he struck a significant amount of gold, in the 1860s he established a sawmill at his rancho on Vining Creek where lumber was cut for shipment to Aurora, then the county seat of Mono County. The mill was located approximately 2 miles up canyon from Lee Vining. The town of Lee Vining (first named Leevining) is a descendant of this enterprise (Carle and Banta, 2008; Chappell, 1947; Trexler, 1980).

During the mid-to-late-1800s, the main routes over the Sierra Nevada ran west to east via Sonora and Mono passes. The latter in particular was a well-known trail to the Native Americans advising Lieutenant Moore on the route to Mono Lake, and the precursor to Tioga Road (Trexler, 1980). Some of the travelers were miners, and others were packers with provisions for settlements. When a prospecting party explored the Tioga Pass area in the 1860s, they discovered ore near Tioga Hill and left a marker consisting of a flattened tin can with the location scratched into it with a knife. The ore they brought out was never analyzed and the party never returned. Around 1875 while herding sheep in the area, William Brusky found the marker and carried out ore that was pronounced worthless; nevertheless, he returned to the location and by 1877 he had found ore rich in silver (Trexler, 1980). Claims were made in 1878, and the Tioga Mining District was organized.

The Great Sierra Consolidated Silver Company bought up all the claims (roughly 350) on Tioga Hill in 1881. They planned to drill a tunnel that went 1,784 feet into the hill at the “Sheepherder Claim”; but in order to do that, a road had to be constructed to transport the drilling equipment across the Sierra. Some of the other claims were worked; however, the silver they thought they would find eluded them. The mining company was suffering financially and pulled out in 1884. However, by this time though, they had constructed the Great Sierra Wagon Road (now Old Tioga Road), meant to bring people, equipment (including the drilling equipment), and supplies from the Central Valley east to the mining districts in Tuolumne and Mono Counties (Trexler, 1980).

Although mining did not pan out along Lee Vining Creek, it did elsewhere in Mono and surrounding Counties. Between 1852 and 1900, settlers established several towns and provided services to the miners. The first settlements, Dogtown and Monoville, served the Virginia and Mono Gulch mines by 1859. Sixteen miles north of Monoville, W.S. Body discovered a claim and established Bodie, which at its peak (between 1879 and 1881) had 10,000 residents. The Dogtown and Monoville settlements were short lived, in part due to their locations and lack of water for placer mining, but unlike the mines in the Tioga District, they were productive. Due to the influx of settlers, petitions to the California legislature to create Mono County started in 1860. The legislation passed, and Mono County was created in 1861. In 1886, Mono County was second in gold and silver production in California. Larger settlements that still exist today have their roots in early settlement and mining in this era, including Lee Vining (1852), Bishop (1862), and Bridgeport (1864) (Cain, 1961; Carle and Banta, 2008; Chapell, 1947).

LOGGING

The need for timber to build mining-related structures, buildings, and entire towns was the catalyst for the timber industry in this area. The best timber was located near Bridgeport and south of Mono Lake. By 1863, there were four sawmills in the area, including Lee Vining's and as others near Big Meadows (Bridgeport) and Lundy. Pine was harvested for lumber, mine props, and cordwood, while pinion and juniper were harvested for mine props and fuel (Chappell, 1947). By 1879, most of the lumber was shipped to Bodie to build the many dwellings in the area and to shore up the mining adits. By the early 1880s, the Bodie Railway and Lumber Company had been organized; they planned to tap into the lumber south of Mono Lake (Mono Mills) (Cain, 1961). Up until the 1880s, lumber was hauled by wagon along roads constructed between the various settlements in the area. The Bodie-Benton Railroad was first constructed in 1881, allowing for timber to be hauled to Bodie from Mono Mills. In 1882, after construction was complete, 5 million feet of lumber and 27,000 cords of wood were shipped to Bodie from Mono Mills (Cain, 1961).

An act of congress created the Sierra Forest Reserve in 1893 in order to control not only logging but also grazing. At this time, the lands within the reserve were managed by the U.S. Department of the Interior. However, in 1905 President Roosevelt reassigned the forest reserves to the newly created USFS. Gifford Pinchot was chosen to head up the Sierra Reserve, which became the Sierra National Forest. The Inyo National Forest, where the majority of the Project is located, was carved out of the Sierra Reserve and created in 1907 (Selters, 2012).

The construction of roads throughout the region aided the expansion of the timber industry. However, as more land was added to the Inyo National Forest, one of its main missions became the protection of wilderness areas and enhancement of recreation. Although timber and grazing managements are still goals, the forest itself is known as a "flagship" forest that manages the non-timber mandates of the USFS as well (Selters, 2012).

AGRICULTURE AND RANCHING

The influx of settlers and the need for sustenance spurred the agriculture and ranching industries. The more fertile areas in the county such as the Bridgeport and Antelope Valleys were quite productive. Bridgeport Valley provided pasture lands for cattle and sheep while the Antelope Valley provided produce such as apples, pears, berries, and wheat (Cain, 1961). Land around Mono Lake was also used for pasturage and crops that were irrigated via ditches by water from Lee Vining Creek in the 1880s. By that time, more than 2,000 acres of land around the lake were under cultivation. Crops and cattle were shipped to the larger mining camps of Bodie and Aurora. Even though the stock market crashed in the 1880s and productivity at Bodie dropped off, these family farms continued to raise stock and grow hay, alfalfa, wheat, barley, potatoes, and other root vegetables. Irrigation from Lee Vining Creek gradually stopped with the development of the Lee Vining Hydroelectric Project in the early 1900s, and little cultivation occurs in the Lee Vining area today (Costello and Marvin, 1983).

Stock, sheep, and cattle were taken to the high country for grazing in the summers. They were driven over the passes, including Tioga and Mono, and were left to graze in the open country. As noted earlier, much of the land in the higher elevations became part of the U.S. Forest Reserves in 1893 and then became managed by the USFS at the turn of the century (Theodoratus, 1984). Sheep grazing became prohibited on U.S. Forest Preserve lands in 1893 due to the perceived destructive nature of this type of grazing. Cattle grazing continued in the higher elevations in the summer and eventually (by the 1920s) became a rather large enterprise for many (Selters, 2012; Theodoratus, 1984). As the snow melted in the spring, ranchers drove their cattle into the higher elevations via a network of trails and stage roads built for the mines. Given the distance and amount of time it took to travel, most ranchers established camps in the high country for the summer (Theodoratus, 1984).

By the 1920s, the invention of the automobile and construction of roads greatly reduced travel time and enabled the ranchers to truck their cattle at least partway into the mountains to graze. Since the cattle returned to the same areas each year, they knew the range and the ranchers, were able to spend their summers together on their ranches instead of in temporary summer camps (Theodoratus, 1984). Automobiles also enhanced other local industries such as logging and recreation.

TRANSPORTATION

Transportation is key to the development of Mono County as well as surrounding areas east of the Sierra Nevada. As noted earlier, supplies were first brought in by packers via trails that ran from the west across the mountains, one of those being the Mono Trail, which was the predecessor to the Tioga Road constructed in the 1880s (Trexler, 1980).

One of the earlier solutions to finding more efficient means of crossing the mountains was the construction of toll roads under franchises granted by the state and county. Individuals and companies maintained the road and collected fees from those who used it. Among the first was a road over Sonora Pass that was completed by 1868, and by the 1870s a stage line operated over this road (Chappell, 1947).

Construction of Tioga Road began in 1882 and was completed in 1883. Different sources indicate that the construction was accomplished by at least 35 and up to 250 Chinese laborers. In the end, the road was never used to haul the mining equipment nor the ore over the pass, and though the route was built by means of a franchise and was technically a toll road, tolls were never charged. Instead, it served mainly as a road used by tourists to travel to Yosemite Valley via horse or wagon until automobiles were allowed in the park in 1913 (Trexler, 1980).

Railroads were planned, but large ones connecting the towns along the east side in the vicinity of the APE were never established. Instead, a small 32-mile-long track, the Bodie-Benton Railroad, was established to connect Bodie to Mono Mills. The Bodie-Benton Railroad was first constructed by Chinese laborers; due to anti-Chinese sentiment, their encampment was removed and the railroad was finished by union laborers. As noted earlier, it provided for hauling timber between Bodie and Mono Mills. Although it was intended to be constructed further south to Benton, the Bodie-Benton Railroad was never extended (Carle and Banta, 2008).

Many trails linked the early mining claims and mining-related settlements such as Bodie, Aurora, Big Meadows, and Lee Vining, providing a means of travel and hauling of supplies and timber (Chappell, 1947). Eventually, many of the trails became wagon roads and were paved. Like Tioga Road, a trail preceded U.S. Route 395. The trail, sometimes known as the Camino Sierra, led from Los Angeles to Lake Tahoe roughly paralleling portions of the present highway. This highway and its predecessors provided a link to routes over the mountains to the west side settlements. Portions were paved in 1932 but did not become a four-lane highway until the 1990s (Carle and Banta, 2008). Today, the highway is a major transportation route connecting Los Angeles to the Canadian Border.

HYDROELECTRIC DEVELOPMENT

Development of the Lee Vining Hydroelectric Project was started by James Stuart Cain. He was an entrepreneur and stockholder in the Standard Consolidated Mining Company in Bodie, California. In 1902, Cain and his partner R.T. Pierce claimed appropriation rights on the waters of Rush Creek and planned to survey Lee Vining Creek. By 1907, Cain had controlling interest in the California-Nevada Canal Water and Power Company. That year he obtained rights-of-way on public land to construct reservoirs on Lee Vining Creek at Saddlebag and Ellery (also known as Rhinedollar) Lakes and on Glacier Canyon at Tioga Lake, as well as the right to build numerous ditches and flumes (Williams and Hicks, 1989).

By 1911, Cain had created the Pacific Power Company and built a power plant at Mill Creek north of Lee Vining Creek. The firm also received Cain's rights to Lee Vining Creek. Delos Allen Chappell, president of Nevada-California Power Company the developer of the Bishop Creek Hydroelectric System, purchased substantial interest in Pacific Power Company. In 1915, he and Cain reorganized the firm as the Pacific Power Corporation, which was acquired by Nevada-California Electric Corporation. Cain turned his interests to Mono County mining projects, and Chappell died in 1916 as the result of an accident. Nevada-California Electric Corporation legally dissolved the Pacific Power Corporation in 1922. In 1923, control of Lee Vining Creek water rights went to its Nevada-California Electric Corporation's subsidiary, Southern Sierras Power Company. Southern Sierras Power Company completed development of the Lee Vining No. 1 and No. 3 Powerhouses by the end of 1924. The Lee Vining powerhouses would eventually supply power to the Imperial Valley (Williams and Hicks, 1989).

In 1936, Southern Sierras Power Company was dissolved. Its operating properties were transferred to its parent company, Nevada-California Electric Corporation. In 1941, the corporation changed its name to California Electric Power Company, which operated the Lee Vining Creek system until they merged with Southern California Edison on January 1, 1964 (Diamond and Hicks, 1988; Williams and Hicks, 1989).

RECREATION

Recreation has a very long history in the Lee Vining area, and it still thrives today. The many lakes, streams, and mineral and hot springs in the area provide opportunities for relaxation, fishing, and swimming, while the surrounding forests and mountains provide opportunities for packing, hunting, and camping. The heavy snowpack in winters provides for activities such as skiing and snowshoeing. Mono Lake is a big draw not only because of its unusual beauty but also because of the unique salinity that keeps swimmers more buoyant than other lakes. Lee Vining Creek and other streams in the watershed are popular with fisherfolk as were Saddlebag, Ellery, and Tioga Lakes.

Hot springs such as Fales Hot Springs, established in the early 1860s, are not only used for recreation but are also perceived as a way to improve one's health. They were a popular stopping point for packers and other travelers where one could stay at the hotel for a night or longer to clean up and rest (Cain, 1961). Recreational packing, though not popular in the early days of settlement, gained steam during the last decades of the 19th century when local residents began taking trips to explore their mountainous surroundings. The rise of mountaineering as a recreational activity further fueled local interest in exploration, and ranchers and farmers in the areas began to rent out their pack animals and themselves as guides. By the 1920s, packing had become a profitable business, as ever-increasing numbers of people with automobiles could reach the Sierra Nevada and pursue recreation activities such as fishing, hunting, camping, and skiing (Woolfenden et al., 2007). Pack stations continued in popularity throughout the middle of the 20th century but began to decline after the 1960s when government contracts dried up and people relied on cars and airplanes to get them where they wanted to go. Additionally, regulations passed in the 1960s limited to 50 the number of head each pack station could run in the Inyo National Forest, which led to a consolidation of pack stations and decrease in operations. By 1990, there were fewer than 50 pack stations operating in the Sierra Nevada, more than an 80 percent reduction from historic highs earlier in the century (Woolfenden et al., 2007).

Yosemite and Mono Lake were the other big draws for recreationists. Until Tioga Road was completed, packers would take groups of people over Mono Pass into Yosemite Valley. They also took groups of people to Mono Lake via Tuolumne Meadows. One of the earlier accounts is from 1858 when a group, including a woman and a baby, led by packers left from Mono Lake and traveled over the pass to Yosemite Valley (Trexler, 1980). The construction of Tioga Road allowed for more visitors to travel to the park and Mono Lake via packing or wagons. Once the road opened to automobiles after the turn of the century, visitors to Yosemite and Mono Lake increased.

Skiing was very popular early on. The first rope tow in the hills above Lee Vining was constructed in the early 1930s. Back-country alpine skiing was also quite popular among more adventurous recreationists. By then, several businesses that catered to the early recreationists had been established in the town of Lee Vining. Also, within the APE these activities lead to the establishment of rustic camps such as Girdasky's Camp Tioga (now Tioga Pass Resort) in the early 1900s (Carle and Banta, 2008). The trail passed near the camp, and later the Tioga Road located slightly further away provided easy access. Girdasky's camp provided accommodations for hunters, fisherfolk, hikers, and back-country skiers. There are also reports that they employed locally based Native Americans in the 1920s and 30s (Davis-King and Snyder, 2010).

As mining ceased, recreation helped the town of Lee Vining survive. Today, it is mostly a tourist stop and a destination for those who want to relax and enjoy a variety of activities year-round.

6.13.4.7. Summary

In summary, the APE and surrounding area have a lengthy history that started in the early 1800s and continues today. The following sections describe previous studies and the archaeological sites, as well as built-environment resources that have been recorded to date. These resources are a testimony to the precontact, ethnographic, and historic-period development of the area explored in the previous sections.

6.13.5. Prefield Research

The SOI PQS in Archaeology and/or History and Architectural History (36 CFR Part 61) personnel conducted background research into the Study Area using a series of research methods. First, a records search was performed to gain an understanding of the known cultural resources within the APE and Study Area. Second, a broader regional context of the area was investigated using existing literature. This information was used to guide identification of archaeological resources and site types. The background research incorporated the Study Area to facilitate knowledge about past settlement and subsistence practices, as well as past land use.

A records search was conducted using the ArcGIS Online database maintained by SCE. This database includes data shared by USFS Region 5, as well as data obtained under subscription from the California Historical Resources Information System. A supplementary records search was also conducted at the Eastern Information Center in February 2021 and Inyo National Forest headquarters in July 2022, immediately preceding fieldwork.

6.13.5.1. Previous Studies

Thirty-three previous cultural resource investigations were identified within the Study Area. Of these, 19 have been conducted within the proposed APE or overlap the proposed APE and Study Area. Among these are various survey and evaluation studies conducted during the last phase of FERC relicensing of the Project (Diamond and Hicks 1988; White 1985a, 1985b; York 1990), which included a larger area than the current relicensing effort. These previous relicensing studies resulted in NRHP determinations for two sites within the current Study Area: P-26-002417 and P-26-002437. Both sites were determined not eligible, with SHPO concurrence.

In 1997, USFS conducted an evaluation of the Tioga Pass Resort (P-26-003308) and designated it a historic district. In 2018, USFS conducted a survey and evaluation of the Saddlebag Lake Resort (FS 05-04-51-01804[17]) and found it ineligible to the NRHP (see the CUL-1 Built-Environment Draft Technical Report, filed as confidential and privileged

[17] These numbers are assigned archaeological site numbers; more information is provided in Table 6.13-1, Table 6.13-2, and Table 6.13-3.

in Volume V of this DLA, for detail on this resource). Switalski and Bardsley (2011) evaluated the Rhinedollar 12 kV circuit (P-26-006236) and found it ineligible to the NRHP; SHPO concurred with these findings.

Other surveys include the California Department of Transportation (Caltrans)-sponsored surveys of State Route 120 (also referred to as Tioga Pass Road) in 1996 and 2010, and a recent survey by Environmental Intelligence, LLC (EI) of SCE circuits on Inyo National Forest, as discussed further in Section 6.13.7, *Study Results*, below. None of these previous or concurrent studies prompted any exclusion of the current APE from this survey. Maps and lists of the previous studies are presented in the CUL-1 Draft Technical Reports, filed as confidential and privileged in Volume V of this DLA.

6.13.5.2. Background Research

In addition to the records search, other data sources were reviewed to guide the field survey. These sources included:

- California Historical Landmarks;
- California Register of Historical Resources;
- General Land Office (GLO) plats and land patents;
- USGS topographic quadrangles;
- NRHP listings;
- Office of Historic Preservation Historic Properties Directory;
- SCE engineering drawings and historic records; and
- Huntington Library Southern California Edison Online Archives.

Review of GLO plats and patents confirm some of the themes listed above as well as provide an overview of past land use in the area. Among the earliest depictions of the area that includes the APE are GLO plats that date to 1895 and 1925. The 1895 GLO plat of Township 1 North Range 25 East depicts the mountainous terrain in which the APE is situated. “Lee Vinings Creek” (sic) runs through the area. Lake Jessie Montrose is in the approximate location of present-day Tioga Lake. A small, unnamed lake is situated on a flat south of the creek in the vicinity of present-day Ellery Lake. Another unnamed lake is indicated at the edge of the township, in the general vicinity of present-day Saddlebag Lake. The majority of the cultural features depicted on the map are west of the APE. They include references to the mining Town of Bennettville labeled “Benettvill,” Tioga Road, the “Benettville and Lundy Telephone Line,” and six mining claims filed west of the APE between 1884 and 1892 (USSG, 1895; GLO, 2022a).

North of Bennettville, the telephone line and Tioga Road come together and follow the same alignment across upper Lee Vining Creek, thus crossing the APE. A ditch is also mapped on the east bank of Lee Vining Creek, south of the telephone and road crossing (USSG, 1895). It appears that the surveyor added extra land in the mountainous terrain at the western portion of the plat. As a result, the exact locations of the road and telephone line crossing and the ditch along Lee Vining Creek cannot be determined from the plat.

The first USGS topographic map of the region dates to 1901. It depicts the lakes and creeks more accurately than the previous GLO plat. Tioga Road extends north of the former location of Bennettville but does not cross Lee Vining Creek or the APE. Instead, a trail crosses the creek southwest of an unnamed lake (USGS, 1901). Tioga Pass Road first appears on the 1908 edition of the topographic map (USGS, 1908).

James Cain and Alfred Grose filed their mining claim for the Australian Lode north of Ellery Lake in 1918. Surveyors from the USSG mapped that claim, which is partially within the APE, when they resurveyed the middle portion of Township 1 North Range 25 East in 1925, documenting the newly constructed Lee Vining Hydroelectric Project. The plat focuses on the east-west corridor from the Poole Powerhouse to Ellery Lake and Tioga Lake. Buildings and structures within the Project that are called out on the plat include the (Poole) powerhouse, a dyke and control house at Ellery Lake, the dam at the northeast corner of Tioga Lake. Other infrastructure associated with the Project that appear on the plat include the tramway and penstock between the powerhouse and Ellery Lake and telephone lines. Tioga Pass Road, labeled “Tioga Highway,” and a portion of Saddlebag Lake Road also appear on the plat (USSG 1925).

Saddlebag Lake Road, initially constructed as part of the Project, does not appear on topographic maps until 1948. The scale of the available 1948 map is relatively large, so road alignments appear approximate and no buildings or structures are included on the map (AMS, 1948). The expansion of Ellery Lake and the major buildings and structures associated with the Project first appear on USGS topographic maps in the 1950s. Other buildings are mapped in the vicinity of Tioga Pass Resort, Saddlebag Lake Resort, and the Saddlebag Wilderness Cabin at the north end of Saddlebag Lake. Campgrounds and unimproved roads are mapped adjacent to and crossing the APE, respectively (USGS, 1955, 1960).

6.13.5.3. Previously Recorded Archaeological Sites

The records search revealed 20 archaeological resources, including 6 precontact resources and 14 dating to the historic period. Of these 20 archaeological resources, 8 were recorded partially or completely within the APE and 12 were plotted within the Study Area only. All previously recorded resources within the APE were ultimately updated or dealt with in some fashion during the survey, as discussed in Section 6.13.7, *Study Results*, below.

The six precontact sites are limited entirely to lithic scatters and isolated tools, all recorded in the 1980s or earlier. As noted above, one of the lithic scatters, CA-MNO-2417, was determined NRHP-ineligible in 1988.

The 14 historic-period resources include several large complexes, most with standing structural elements as well as archaeological features and deposits (Tioga Pass Resort, Saddlebag Lake Resort, the Rhinedollar Complex, Sawmill Campground, and Bennettville Mine), as well as several separately recorded segments of the Old Tioga Road, and other features and debris scatters of unknown association. Two of the historic-period archaeological sites within the APE have been evaluated for their eligibility for listing in the NRHP; both were determined not eligible (CA-MNO-2437 and P-26-006236). Another resource, the Tioga Pass Resort, was determined to constitute a historic district in 1997.

All records search resources within the current Study Area were ultimately re-recorded or addressed in some fashion during the survey, as discussed in Survey Results below.

POTENTIAL ARCHAEOLOGICAL SITE TYPES

Based on the review of previous records and contextual research, a broad range of site types was anticipated within the APE, but not limited to, the following:

Expected precontact resource types include:

- Lithic scatters;
- Habitation sites (ground stone, pottery, beads);
- Midden deposits;
- Milling features and associated artifacts (bedrock milling stations, portable millingstones, handstones, and pestles);
- Rock features such as cairns, hearths, and hunting blinds;
- Earthen features (piaggi rings, wind shelters, water control); and
- Trails.

Historic-period resource types include:

- Residential sites;
- Foundations and tent flats;
- Privies;
- Refuse dumps;
- Industrial remains of mining and timbering activities;
- Agricultural resources;

- Sites related to post-contact Native American occupation and use;
- Transportation resources;
- Recreational resources;
- Construction camps; and
- Other resources related to the construction or operation of the Project.

6.13.5.4. Previously Recorded Built-Environment Resources

Archival research conducted to date identified four previously documented built-environment resources within the Project APE. These include: the Rhinedollar Circuit (P-26-006236), the Tioga Pass Resort (P-26-003308), and segments of the Old Tioga Road. Names of resources in this section appear as they were originally recorded.

LEE VINING CREEK HYDROELECTRIC PROJECT

The Lee Vining Creek Hydroelectric Project (Project) is composed of three dams and reservoirs, an auxiliary dam, a conduit, a powerhouse and related structures, and a substation and related structures. Built between 1917 and 1924, original plans of the project called for a second powerhouse, which was constructed in 1924 but ceased to operate in 1940, and the construction of a third powerhouse that was never undertaken (Williams and Hicks, 1989). The Project was evaluated for the NRHP by James C. Williams and Robert A. Hicks in 1988. The only element of the system that was determined eligible was the Triplex Cottage, under Criterion C, located at Lee Vining Powerhouse No. 1 (i.e., Poole Powerhouse).

The period of significance for the cottage was determined between 1920 and 1930. It is a French Eclectic triplex designed by G. Stanley Wilson, an architect based in Riverside, California. "His work was of very high quality, and he was a leading practitioner of the Spanish-Colonial revival during the 1920s" (Williams and Hicks, 1989:26). The building is considered eligible for the NRHP under Criterion C, for its distinctive architectural characteristics, which represent the work of a master.

The rest of the system was determined not NRHP-eligible due to a lack of significance under any NRHP criteria and diminished integrity. The engineering techniques used to construct the Project were commonplace for hydroelectric systems built during the 1920s. Examples of commonplace components within the Project include the rock-filled dams at Saddlebag, Ellery, and Tioga Lakes (Williams and Hicks, 1989). Additionally, at the Lee Vining Substation (former Lee Vining Powerhouse No. 3) one of the related cottages had been removed, one was greatly altered, and other buildings had been removed or substantially altered. Major additions had also been made in the form of switch racks, transformers, fencing, and grading. Additionally, Williams and Hicks noted that decommissioning Powerhouse No. 3 greatly compromised the Project's overall integrity (Williams and Hicks, 1989).

RHINEDOLLAR CIRCUIT

Built in 1919 by the Nevada-California Power Company, the Rhinedollar Circuit is an electrical distribution system that runs between the Poole Powerhouse Complex and the Operator's Cabin at the north bank of Ellery (Rhinedollar) Lake. Switalski and Bardsley recorded the distribution circuit in 2011 as part of a pole replacement project. They noted that the original alignment for the distribution circuit likely followed the penstock alignment, as remnants of wood pole supports were observed along the penstock (Switalski and Bardsley 2011:14). Switalski and Bardsley recommended the structure does not meet any of the NRHP eligibility criteria, nor does it retain integrity.

TIOGA PASS RESORT

Tioga Pass Resort is a recreational resort located along State Route 120 northeast of Tioga Lake. Early construction took place in 1914 when Albert Gardisky established a homestead. The Main Lodge and Cabins 1 through 4 were constructed by 1916, and in the early 1920s, Gardisky began charging visitors to stay at his new resort. It is likely that official permits for the resort were issued around this time (Cutts, 1997:7). The resort was expanded by subsequent owners in the mid- and late-twentieth century through the construction of several additional cabins and supporting structures. In 1997, Inyo National Forest archaeologist Janette S. Cutts evaluated the Tioga Pass Resort for its eligibility for listing in the NRHP as a historic district. Inyo National Forest determined the Tioga Pass Resort as an eligible historic district, and the SHPO concurred in July 1997 (Widell, 1997). The subsequent work done within the resort was completed following the SOI Standards for Rehabilitation (Inyo National Forest, 1997).

Cutts defined the period of significance as 1915 to 1940, when automobile traffic was first allowed in Yosemite National Park to when Tioga Pass Road was altered in order to make automobile traffic easier (Cutts, 1997:12–14). While Cutts did not define a specific boundary, she listed all of the contributing and noncontributing resources within the historic district, which are clustered in a generally elliptical shape around Glacier Creek.

OLD TIOGA ROAD

Several abandoned segments of Old Tioga Road have previously been recorded as archaeological resources. For information regarding these abandoned segments, please refer to the CUL-1 Archaeology Draft Technical Report and the updated DPR form (filed as confidential and privileged in Volume V of this DLA).

6.13.6. SURVEY AND DOCUMENTATION METHODS

The archaeological and built-environment inventory was performed to current professional standards, as defined in the SOI PQS for Archaeology and Historic Preservation by Historical Research Associates, Inc., (HRA) and Far Western Anthropological Research Group, Inc., (FW). Archaeological survey occurring on Inyo National Forest lands was conducted by under Organic Act permit numbers LVD22022 (HRA) and LVD22023 (FW).

6.13.6.1. Archaeological Survey Methods

The field investigations were conducted between July 20 and August 12, 2022 (17 field days total, broken into two sessions). Field survey was directed by Jordan Pickrell, Ph.D., of HRA, and Erik Martin, Ph.D., of FW. Kutzadika[a] (Kootzaduka'a). Tribal representative Damon Dondero also participated in fieldwork.

During the inventory, archaeologists walked parallel transects spaced at no more than 65.6-foot (20-meter) intervals, as vegetation and terrain allowed. Representative photographs were taken throughout the APE. GPS data was collected to record the progress of the survey each day. Estimates of surface visibility, vegetation communities, and other physical attributes of the areas were also noted on the survey maps. Areas within the APE that could not be accessed in a safe manner (e.g., slopes over 30 percent underwater) were not included in the survey; these areas are identified in the CUL-1 Archaeology Draft Technical Report, which is filed as confidential and privileged in Volume V of this DLA.

6.13.6.2. Built-Environment Survey Methods

Background research identified 28 resources requiring survey and inventory in the APE. HRA's architectural historians conducted field survey of the APE both to verify the presence and current condition of previously recorded resources and to inventory and evaluate the NRHP eligibility of previously unidentified resources.

In July 2022, Libby Provost and Lauren Waldroop conducted field survey of the APE. They reviewed resources identified in the background research and identified additional resources while in the field within the APE. Provost photographed the resources, and Waldroop took GPS locations and field notes regarding physical descriptions and observed alterations.

6.13.6.3. Archaeological Recordation Methods

All previously recorded sites within or adjacent to the APE were visited during the 2022 field investigations. Examination of these sites focused on relocating previously recorded features, concentrations, or diagnostic artifacts within the site, then walking meandering transects spaced no more than 15 meters apart and flagging any additional artifacts or features observed. If artifacts were observed beyond the previously mapped site boundary, crews continued their transects until they no longer observed cultural materials on the surface or artifact densities dropped significantly. Sketch maps were assessed to determine whether they needed to be updated to reflect current site conditions or more modern recording methods (GPS).

In accordance with Inyo National Forest standards, newly identified archaeological sites were defined as 10 or more artifacts in a 10-meter by 10-meter area. If deposits included mixed artifact classes (i.e., flaked and ground stone artifacts, midden, brownware pottery, and/or historic items), the 10-item requirement was abandoned and the resource recorded as a site. Site perimeters were delineated by a 20-meter break in surface artifacts.

New sites were fully documented following the recordation procedures outlined in *Instructions for Recording Historical Resources* (OHP, 1995), using the appropriate DPR 523 forms. The recordation of new sites included documentation, photographs, and GPS of all features, formed artifacts, and site boundaries. Additional artifacts, such as fragmentary glass or debitage, were roughly quantified and a representative sample assessed for additional information (e.g., glass color, flake type). Any site disturbances were noted and photographed as appropriate. Isolates were recorded on a Project isolate log; per Inyo National Forest, no DPR 523 forms were prepared for isolated finds. No artifacts were collected during the inventory.

6.13.6.4. Built-Environment Recordation Methodology

In consultation with SCE, HRA grouped multicomponent resources into complexes. While the background research identified 28 built-environment resources within the APE, many of these resources have been documented as features of a multicomponent complex.

Lee Vining Hydroelectric Project-Associated Resources

For resources within the current APE that were built *during* the historic period determined for the CUL-1 Draft Technical Reports (i.e., 1977 or earlier), HRA completed a condition assessment and physical description, reevaluated the resources against the Lee Vining Hydroelectric Project facilities evaluation by Williams and Hicks (1989), and completed DPR 523 forms.

For Lee Vining Hydroelectric Project-related resources within the current APE that were built *after* the historic period determined for the CUL-1 Draft Technical Reports (i.e., 1978 or later), HRA included the resource in the survey population and maps but completed neither a writeup in the report nor a DPR 523 form.

During the field survey, HRA identified some previously undocumented historic-period resources within the APE. These included gaging stations, valve houses, and related structures. When HRA identified buildings and structures in the field that had not been previously recorded, surveyors researched their historic-period function within the Project and grouped them with the appropriate resource or complex of resources that had already been evaluated (e.g., HRA documented dams, reservoirs, spillways, tunnels/outlets, and reservoir gaging station recorder houses as features of three complexes, one at each of the three storage reservoirs). When HRA identified inconsistencies in classification or evaluation (i.e., resources documented as individual resources when they are best documented as features of a complex), surveyors adjusted classifications (i.e., documented the many appurtenant structures along flowlines as features of the flowline) in updated evaluations.

Non-Lee Vining Hydroelectric Project Resources

For resources within the current APE not associated with the Lee Vining Hydroelectric Project that were built *during* the historic period determined for this study (i.e., 1977 or earlier), HRA completed an updated condition assessment (for resources already determined to be eligible for or contributing to a historic district) and physical description, evaluated the resources against the NRHP criterion, and completed DPR forms, as appropriate. For these resources, HRA provided physical descriptions, made eligibility recommendations, and completed DPR forms.

For contributing resources within the one NRHP-eligible historic district that overlaps with the APE (i.e., Tioga Pass Resort), HRA surveyed and inventoried all resources in the historic district, included them in the survey population table, and provided condition assessments and physical writeups in the report. Per SCE's direction, HRA created a DPR form for the district with a table of resources and attached the completed DPR forms for individual resources within the district.

For resources within the current APE not associated with the Lee Vining Hydroelectric Project that were built *after* the historic period determined for this study (i.e., 1978 or later), HRA included the resource in the survey population table and on maps but completed neither a writeup in the report nor a DPR primary record and/or building, structure, object form.

Effects analysis for resources outside the APE generally did not fall under the scope of this study. However, in the case of previously identified historic districts, it was determined that if they overlapped the APE, then HRA would collect information on resources within the historic districts to accurately inform our recommendations regarding the significance and integrity of these resources as well as possible Project effects to the historic districts. HRA thus conducted field survey of all previously documented contributing resources of historic districts that intersect with the APE and included those resources in the survey population tables below with both past and updated NRHP recommendations.

CHRONOLOGICAL CONSIDERATIONS FOR PREVIOUSLY AND NEWLY SURVEYED RESOURCES

Thirty-three years have passed since Williams and Hicks completed their survey and evaluation of the Lee Vining Hydroelectric Project and its facilities. In the intervening years, hydroelectric resources were altered, demolished, or constructed. The historic period for this study is defined pre-1978, which includes all resources that will reach the age of 50 by the time of the FERC relicensing. In its evaluations, HRA addressed resources within the current APE as follows for Lee Vining Hydroelectric Project facilities and non-Project-related resources.

6.13.6.5. National Register of Historic Places Evaluation Methods

Based upon the research, outreach, and field survey undertaken as part of this study effort, qualified personnel under the SOI PQS analyzed the NRHP eligibility of archaeological sites and historic-period (45 years old or older) built-environment resources in the APE. In some instances, additional information is required to complete an evaluation for some of the archaeological sites, and thus they remain unevaluated at this time.

Cultural resources were evaluated for NRHP eligibility both as individual resources and as potential contributors to an existing historic district when appropriate. For resources that have already been either determined eligible or contributing, this study assessed integrity against previous documentation and noted known alterations.

When possible, all cultural resources within the APE were evaluated for their significance by the guidelines laid out under the NHPA and codified by the National Park Service (NPS) in its primary NRHP Bulletin 15, *How to Apply the National Register Criteria for Evaluation* (NPS, 1997):

- **Criterion A:** Resources that are associated with events that have made a significant contribution to the broad patterns of our history.
- **Criterion B:** Resources that are associated with the lives of significant persons in our past.
- **Criterion C**: Resources that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction.
- **Criterion D**: Resources that have yielded or may be likely to yield, information important in history or prehistory [NPS, 1997:2].

In addition to significance under one or more of the criteria listed above, a resource must also possess integrity, defined by seven aspects as follows (NPS, 1997):

1. **Location:** the place where the historic property was constructed or the place where the historic event took place.
2. **Design:** the composition of elements that constitute the form, plan, space, structure, and style of a property.
3. **Setting:** the physical environment of a historic property that illustrates the character of the place.
4. **Materials:** the physical elements combined in a particular pattern or configuration.
5. **Workmanship:** the physical evidence of the crafts of a particular culture or people during any given period of history.
6. **Feeling:** the quality that a historic property has in evoking the aesthetic or historic sense of a past period of time.
7. **Association:** the direct link between a property and the event or person for which the property is significant [NPS, 1997:44–45].

Because the criteria of the California Register of Historical Resources generally align with that of the NRHP, resources were also (by default) evaluated under this evaluative framework, which is codified at California Code of Regulations, Title 14, Division 3, Chapter 11.5, Section 4850 et seq.

6.13.7. Study Results

6.13.7.1. Archaeological Resources Results

The total area of the APE is approximately 619 acres. Systematic archaeological survey with 100 percent coverage was conducted on 203 of those acres. The remaining acreage was excluded from the survey due to steep slopes or open water. Ground-surface visibility in the accessible portions of the APE was generally good except in riparian corridors. Maps depicting the areas surveyed are located in appendices of the CUL-1 Archaeology Draft Technical Report (filed as confidential and privileged in Volume V of this DLA).

In total, 20 archaeological sites were revisited or newly identified within the APE. Of these, four were previously recorded and 16 were newly recorded. All four of the previously recorded resources and six of the newly recorded ones also contain built-environment elements, mostly related to the Lee Vining Hydroelectric Project.

Sites within the APE include precontact lithic scatters and historic-period sites related to the hydroelectric project, recreation, and transportation in the region. Each of the archaeological sites associated with the hydroelectric project is a component of a complex that includes built-environment resources as well as archaeological resources.

Fourteen archaeological isolates were identified during the inventory. Three are precontact while the rest date to the historic period. The precontact isolates consist of isolated obsidian flakes or nodules. The historic-period isolates are artifacts related to mining, logging, and recreation. All of the archaeological sites are on Inyo National Forest land; three of them also extend onto SCE land. All except one of the isolates is on Inyo National Forest land. Due to confidentiality, the archaeological sites and isolates are not fully described in here but are fully discussed in t the CUL-1 Archaeology Draft Technical Report (filed as confidential and privileged in Volume V of this DLA). The following is a summary of results.

<u>Previously Recorded Archaeological Sites Not Located During Survey</u>

Two previously recorded archaeological sites that were mapped within the APE were not re-located during the 2022 survey. Archaeological site P-26-000016 was a lithic scatter documented in 1952 and not subsequently recorded since then. During the current survey, a diligent survey of the reported site location failed to reveal any cultural material, except for a single flake just outside the plotted location; this flake was recorded as an isolate (ISOLV04). Archaeological site P-26-002417 was a lithic scatter documented in 1984 and determined not eligible for listing in the NRHP in 1988 (FERC821004D). Again, a diligent search of the area failed to reveal any cultural material despite a high degree of certainty in the previous mapping. The area has a heavy cover of riparian vegetation.

ARCHAEOLOGICAL SITE ASSESSMENT AND EVALUATIONS

The following sections present a typology of the recorded precontact and historic-period site types within the APE. Site types for historic-period resources are based on function and association. The historic-period site categories are hydroelectric development, recreation, transportation, and undefined. The subsections for each site type include tables listing relevant sites, and assessments of NRHP eligibility, when possible. Sites that include both historic and precontact components are discussed under both relevant categories. The assessments of NRHP eligibility are based on the results of the pedestrian survey. No subsurface survey was completed during the 2022 inventory. Evaluation results are presented in Table 6.13-1.

Precontact Sites and Components

There are five sites with precontact components, not including the two sites that could not be located. Of these two are multicomponent sites (P-26-002437 and FS 05-04-51-01973) each with a single isolated obsidian debitage, a milling feature and one isolated artifact (FS 05-04-51-01979) and two lithic scatters (FS 05-04-51-01974, and -01976) as listed in Table 6.13-1.

Historic-Period Sites: Hydroelectric Development Theme

The Lee Vining Hydroelectric Project Lee Vining Hydroelectric Project was constructed in the early 20th century. Major elements of the Project include the Poole Powerhouse Complex; a flowline, tunnel, and penstock; Rhinedollar Dam Complex; Tioga Dam Complex; Saddlebag Dam Complex; and Lee Vining Substation Complex. Each of these resources is part of a complex made up of built-environment resources or built-environment and archaeological components. Ancillary built-environment resources included the Bishop-Lundy (Mill Creek-Control) transmission line and the Rhinedollar distribution line, as well as two roads constructed for the Project, Poole Power Plant Road and Saddlebag Lake Road are documented as part of the Project (CUL-1 Built-Environment Draft Technical Report, filed as confidential and privileged in Volume V of this DLA).

Two of the previously documented archaeological resources and five of the newly identified archaeological resources are associated with the Project (Table 6.13-1). They include archaeological components of the powerhouse and dam/reservoir complexes (P-26-002437, FS 05-04-51-01972, FS 05-04-51-01975, and FS 05-04-51-01980) that were constructed for the Project, the ruins of infrastructure associated with modern conduit and distribution lines (P-26-006236, FS 05-04-51-01973), and an abandoned road segment (FS 05-04-51-01977) associated with Saddlebag Lake Road, which was initially constructed for the Project.

Historic-Period Sites: Recreation Theme

Four sites within the APE are characterized by features or artifacts related to recreation (Table 6.13-1). The association of these archaeological components and sites with recreation is determined by their association with buildings at the Tioga Pass Resort

(P-26-003308) and the USFS Saddlebag Wilderness Cabin (FS 05-04-51-01981) or by the character of the artifacts observed and location along reservoirs frequented by recreationists (FS 05-04-51-01982 and FS 05-04-51-01983).

Table 6.13-1. Summary of the Results of the Archaeological Survey and Evaluations

Primary Number	Trinomial	USFS Number	Age	Summary Description of Archaeological Component	Historic Theme	Land Manager	NRHP Eligibility
P-26-002437	CA-MNO-2437/H	05-04-51-01163	M	Former construction camp, industrial footings and machinery mounts, and monolith	Hydroelectric Development	USFS and Private	Recommended not eligible; Locus A (former construction camp) determined not eligible, 2/06/90 (FERC821004D)
P-26-003308	CA-MNO-3247H	05-04-51-01259	H	Debris scatter	Recreation	USFS	Recommended as a noncontributing to the Tioga Pass Resort Historic District; Not individually eligible
P-26-006236	-	05-04-51-01683	H	Industrial debris and footings associated with former towers and poles	Hydroelectric Development	USFS and SCE	Determined not eligible in 2011 (USFS110413A)
P-26-008527	CA-MNO-6106H	05-04-51-01750	H	Abandoned segments of former Tioga Pass Road alignments	Transportation	USFS and SCE	Segments A and B recommended not eligible; Segment C unevaluated due to inundation
-	-	05-04-51-01972	H	Abandoned utility infrastructure, foundations and pads, trail segment, and debris concentrations	Hydroelectric Development	USFS	Recommended not eligible

Primary Number	Trinomial	USFS Number	Age	Summary Description of Archaeological Component	Historic Theme	Land Manager	NRHP Eligibility
-	-	05-04-51-01973	M	Remnants of transport and utility/communication infrastructure	Hydroelectric Development	USFS	Recommended not eligible
-	-	05-04-51-01974	P	Lithic scatter	Precontact	USFS	Unevaluated
-	-	05-04-51-01975	H	Quarry	Hydroelectric Development	USFS	Recommended not eligible
-	-	05-04-51-01976	P	Lithic scatter	Precontact	USFS	Unevaluated
-	-	05-04-51-01977	H	Abandoned segment of former Saddlebag Lake Road alignment	Hydroelectric Development	USFS	Recommended not eligible
-	-	05-04-51-01978	H	Machinery	Unidentified Historic	USFS	Recommended not eligible
-	-	05-04-51-01979	M	Millingslick, debitage, and historic-period waste rock field	Precontact; Unidentified Historic	USFS	Recommended not eligible (both components)
-	-	05-04-51-01980	H	Quarry, machinery and pads, abandoned access route and hardware	Hydroelectric Development	USFS	Recommended not eligible
-	-	05-04-51-01981	H	Foundation, depression, graded pad, and light artifact scatter	Recreation	USFS	Recommended not eligible
-	-	05-04-51-01982	H	Debris scatter	Recreation	USFS	Recommended not eligible
-	-	05-04-51-01983	H	Debris scatter	Recreation	USFS	Recommended not eligible

Primary Number	Trinomial	USFS Number	Age	Summary Description of Archaeological Component	Historic Theme	Land Manager	NRHP Eligibility
-	-	05-04-51-01984	H	Trench	Unidentified Historic	USFS	Recommended not eligible
-	-	05-04-51-01985	H	Former road alignment to Hess Mine	Transportation	USFS	Recommended not eligible
-	-	05-04-51-01986	H	Former road alignment to Timberline Experiment Station	Transportation	USFS	Recommended not eligible
-	-	05-04-51-01987	H	Ditch	Unidentified Historic	USFS	Recommended not eligible

BE = includes built-environment elements; H = Historic-period; M = Multicomponent; NRHP = National Register of Historic Places; P = Precontact; SCE = Southern California Edison; USFS = U.S. Forest Service

Historic-Period Sites: Transportation Theme

Alignments associated with four former roads (P-26-008527, FS 05-04-51-01977, FS 05-04-51-01985, and FS 05-04-51-01986) were recorded within the APE (Table 6.13-1). In the case of Tioga Pass Road (P-26-008527) three different abandoned road segments within the APE represent early- to mid-20th century alignments of the modern route. FS 05-04-51-01977 is discussed in the hydroelectric development section above as it is associated with Saddlebag Lake Road, which was constructed for the Project. FS 05-04-51-01985 is the alignment of a former road to the Timberline Experiment Station west of the APE. FS 05-04-51-01986 is the alignment of a mid-twentieth-century road to mines northwest of the APE.

FS 05-04-51-01985, FS 05-04-51-01986, and portion of P-26-008527 have each been repurposed as hiking trails that are frequented by recreationists. The longest intact segment of P-26-008527 is inundated by Ellery Lake.

Historic-Period Sites: Undefined Theme/Function

Four archaeological sites recorded within the APE cannot be classified by function (Table 6.13-1). They include a concentration of machinery pieces of indeterminate purpose (FS 05-04-51-01978), two areas of landscape modification (the historic-period component of FS 05-04-51-01979 and FS 05-04-51-01984) that could not definitively be associated with the Project or any other development project in the region, and a ditch along Lee Vining Creek with no associated artifacts. Features recorded at each of these sites were in fair to good condition. However, evidence of modern recreational activity, in the form of debris and/or campfires, was observed at three of the four sites. It appears that construction of Saddlebag Lake Road disturbed archaeological site FS 05-04-51-01987 during the historic-period.

6.13.7.2. Built-Environment Resources Results

Located within the Project APE and Study Area are numerous historic-period built-environment resources associated with the Project. Other identified built-environment resources are associated with the themes of mining, transportation, and recreation.

LEE VINING HYDROELECTRIC BUILT-ENVIRONMENT RESOURCES

The original design for the Project included three powerhouses, three dams, one auxiliary dam, and an intake. Construction took place in two main phases. The first phase dates from 1917 to 1922 under the Nevada-California Power Company, and the second phase dates from 1922 to 1929 under the Southern Sierras Power Company. One of the powerhouses was never constructed, and nearly all of the remaining major features have been substantially altered for continued use. The integrity of the overall Project was diminished by the decommissioning of Powerhouse No. 3 (Lee Vining Substation Powerhouse), as well as substantial alterations to several of the prominent resources within the Project including all three of the dams.

During the current evaluation efforts, SCE's consultant revisited each of the resources within the Project to assess integrity against NRHP standards and reassess each resource's potential eligibility for individual listing. The current study determined that 32 of the original 37 built-environment resources evaluated as part of the Project in 1989 are extant; 5 of the original 37 resources have been demolished. As part of the current study, SCE grouped 30 extant resources as features within 12 complexes based on their associated uses. Two resources were recorded individually as they either were previously determined or are currently recommended individually eligible for listing in the NRHP. See Table 6.13-2 for a complete listing of built-environment resources associated with the Lee Vining Hydroelectric Project documented and evaluated for this study. In total, the study evaluates 12 extant resources or complexes associated with the Project. Of these, two structures and five complexes have both built-environment and archaeological components; and two buildings, two structures, and one complex only have built-environment components.

Table 6.13-2. Lee Vining Hydroelectric Project Built-Environment Resources

Primary Number	USFS Number	Historic Name / Current Name	Associated Facility	Date(s) of Construction	Previous NRHP Eligibility	In APE?	Current NRHP Recommendations
-	FS 05-04-51-01988	Lee Vining Hydroelectric Project	Lee Vining Hydroelectric Project	1912–1929	Not Eligible	Yes (partially)	Not Eligible
-	FS 05-04-51-01989	Poole Powerhouse (Building 0101)	Poole Powerhouse	1924	Not Eligible	Yes	Individually Eligible
-	FS 05-04-51-01990	Triplex Cottage (Building 0102)	Poole Powerhouse	1924	Individually Eligible	Yes	Individually Eligible
-	FS 05-04-51-01972	Poole Powerhouse Complex	Poole Powerhouse	1919–1927	Not Eligible	Yes	Not Eligible
P-14-014235 P-26-009006	FS 05-04-53-02829	Bishop-Lundy (Mill Creek-Control) Transmission Line	Poole Powerhouse	1913–1924; 1940; 1965; 1987	Not Eligible	Yes (partially)	Not Eligible
-	FS 05-04-51-01992	Poole Power Plant Road	Poole Powerhouse	1917	Not Eligible	Yes (partially)	Not Eligible
P-26-006236	FS 05-04-51-01683	Rhinedollar Circuit	Rhinedollar Dam/Poole Powerhouse	1919	Not Eligible	Yes (partially)	Not Eligible
-	FS 05-04-51-01973	Flowline, Tunnel, Penstock	Rhinedollar Dam/Poole Powerhouse	1920–1927	Not Eligible	Yes	Not Eligible
P-26-002437	FS 05-04-51-01163	Rhinedollar Complex	Rhinedollar Dam	1917–1927	Not Eligible	Yes	Not Eligible
-	FS 05-04-51-01975	Tioga Complex	Tioga Dam	1917–1929	Not Eligible	Yes	Not Eligible

Primary Number	USFS Number	Historic Name / Current Name	Associated Facility	Date(s) of Construction	Previous NRHP Eligibility	In APE?	Current NRHP Recommendations
-	FS 05-04-51-01980	Saddlebag Complex	Saddlebag Dam	1917–1921	Not Eligible	Yes	Not Eligible
-	FS 05-04-51-01977	Saddlebag Lake Road	Saddlebag Dam	1917	Not Eligible	Yes (partially)	Not Eligible
-	FS 05-04-51-01991	Lee Vining Substation Complex	Lee Vining Substation (formally Powerhouse No. 3)	1924	Not Eligible	No	Not Eligible

APE = Area of Potential Effects; NRHP = National Register of Historic Places; USFS = U.S. Forest Service

NON-HYDROELECTRIC DEVELOPMENT BUILT-ENVIRONMENT RESOURCES

Four built-environment resource not directly associated with the Project are located within the APE and include Tioga Pass Road/Highway 120 and three recreation facilities managed under permits for the USFS to other entities. See Table 6.13-3 for a complete listing of built-environment resources within the APE, but not associated with the Project documented and evaluated for this study.

Table 6.13-3. Other Built-Environment Resources

Primary Number	USFS Number	Historic Name/ Current Name	Date(s) of Construction	Previous NRHP Eligibility	In APE?	Current NRHP Recommendations
P-26-008527	FS 05-04-51-01750/ FS 05-04-51-01820	Tioga Pass Road/Hwy 120	1902–1905; 1924; 1939–1940; 1965–1970	-	Yes (partially)	Not Eligible
-	FS 05-04-51-01804	Saddlebag Lake Resort	1946–1947	Not Eligible	Yes (partially)	Not Eligible
-	FS 05-04-51-01981	Saddlebag Wilderness Cabin Complex	1930	-	Yes (partially)	Not Eligible
P-26-003308	FS 05-04-51-01259	Tioga Pass Resort	-	Eligible Historic District	Yes (partially)	Eligible

APE = Area of Potential Effects; NRHP = National Register of Historic Places; USFS = U.S. Forest Service

6.13.8. POTENTIAL ADVERSE EFFECTS AND ISSUES

6.13.8.1. Current Resources Management Plan

As part of the previous relicensing, SCE prepared a document entitled Management Plan for Historic and Archaeological Resources Associated with the *Historic and Archaeological Preservation Plan for the Lee Vining Creek Hydroelectric Project (FERC Project 1388), Inyo, California* (White 1990). The plan identifies specific measures undertaken by SCE to avoid adverse effects to the NRHP-eligible properties located within the FERC Project Boundary and various programmatic measures that SCE is required to implement.

6.13.8.2. Current Potential Adverse Effects and Issues on Cultural Resources

FERC's decision to issue a new license is considered an "undertaking" pursuant to 36 CFR 800.16(y), and the NHPA requires federal agencies to consider the effect of undertakings on historic properties and provide the ACHP an opportunity to comment. Project O&M could potentially affect cultural and Tribal resources, Traditional Cultural Properties (TCPs), and other resources of traditional, cultural, or religious importance to the Native American community.

The purpose of identifying effects is to determine which resources may have heritage values compromised or altered, and to aid in the development of management/protection measures that would be incorporated into the HPMP for the Project. PME measures will be developed in consultation with the Stakeholders and Tribes and will be incorporated into the HPMP.

ARCHAEOLOGICAL RESOURCES

During the 2022 survey, archaeologists observed various disturbances to sites, including those caused by erosion, construction, wave action and inundation, O&M activities at the Project, and recreation. To assist SCE in prioritizing management measures at archaeological sites most likely to be affected by the Project, the crew assessed whether each archaeological site is or may be affected by O&M of the Project in the future. Non-Project-related effects, or the potential for them to occur at the sites, were also noted by the crew. The purpose of identifying effects is to aid in the development of management measures that will be incorporated into the HPMP for the Project.

Of the archaeological sites revisited and newly identified during the 2022 inventory, 17 were evaluated and recommended not eligible for listing in the NRHP. One abandoned segment (Segment C) of Tioga Pass Road (P-26-008527) was submerged under Ellery Lake at the time of the inventory. As such, it could not be evaluated for listing in the NRHP. Potential effects to this resource include continued wave action for being submerged under Ellery Lake. Two precontact lithic scatters (FS 05-04-51-01974 and FS 05-04-51-01976) also remain unevaluated. FS 05-04-51-01974 may be subject to wave action and inundation, while both lithic scatters may be affected by recreation activities within the USFS but are not subject to immediate effects due to Project operations.

BUILT-ENVIRONMENT RESOURCES

As the Project is not an NRHP-eligible historic district, there is a finding of no effect on the Project as a whole. However, the Poole Powerhouse (Building 0101) and Triplex Cottage (Building 0102) are both individually eligible for listing in the NRHP under Criterion C in the area of architecture as examples of the Greek Revival and French Eclectic styles, respectively. Project-related effects (some of which may be adverse) to historic properties for the Project may include but are not limited to new construction or demolition of, moving, or major alterations to a historic property. Regular Project O&M should not constitute an adverse effect unless done in a manner inconsistent with the HPMP that the new license will require. Another effect (likely adverse) would be if the license was surrender. In cases where built-environment resources sit on parcels located along free-flowing portions of the creeks (e.g., Tioga Pass Resort, and contributing resources within the NRHP-eligible Tioga Pass Resort Historic District), the study has identified no immediate, direct Project-related effects.

NO ACTION

Under the No Action, SCE would continue Project O&M in accordance with the terms and conditions of the existing FERC Project license. Effects to historic properties, resources that are being reevaluated, and unevaluated resources as a result of Project O&M have been identified, relative to baseline conditions.

PROPOSED ACTION

Under the Proposed Action, SCE will continue Project O&M activities in accordance with the terms and conditions of the license to be issued for the Proposed Action. The Proposed Action includes implementation of new MIFs, and other resource management plans. Specific to cultural resources, SCE is in the process of developing an HPMP.

6.13.8.3. Consistency with Inyo National Forest Land Management Plan

SCE reviewed the desired conditions in the Inyo National Forest LMP for consistency with the Project (USDA, 2019). Desired conditions with which the Project is consistent include (USDA, 2019):

- CULT-FW-DC 01: Cultural resources (buildings, sites, districts, structures, and objects) having scientific, cultural or social values are preserved and protected for their cultural importance. Site integrity and stability are protected and maintained on sites that are susceptible to imminent risks or threats, or where values are rare or unique. Priority heritage assets are stable and their significant values protected; vandalism, lootings, theft, and human-caused damage to heritage resources are rare. Site significance and integrity are maintained through conservation and preservation efforts.

- CULT-FW-DC-03: Cultural resources provide educational opportunities that connect people to the land and its history. Through interpretive sites, historic standing structures, and other materials, the national forest provides opportunities for an appreciation of the region's history and an awareness of preservation efforts. In some cases, historic routes (such as railroad grades) are used for recreation trails with interpretation of their history and historic features. Heritage-based recreation opportunities are connected, where practical, with other recreation opportunities such as trails.

- VIPS-FW-DC 06: Nationally registered historic sites and culturally important properties retain their historic and cultural significance when public use and education opportunities are provided.

6.13.8.4. Proposed Mitigation and Enhancement Measures

Potential effects and PME measures related to this resource are described in the CUL-1 Draft Technical Report (filed as confidential and privileged in Volume V of this DLA). An HPMP (PME-5) is being developed. After consultation with the appropriate Stakeholders and Tribes, SCE intends to send the HPMP to FERC with the FLA. It will be implemented after license issuance. The HPMP will include guidelines for monitoring archaeological site conditions as well as PME measures to avoid, minimize, and/or mitigate direct and indirect effects to NRHP eligible or listed resources.

6.14. Tribal Resources

This section summarizes data and findings developed in association with implementation of the Tribal Resource (TRI-1) Technical Study Plan approved by FERC. Specifically, this section provides a description of the methods and results of the background research, contact with Native Americans, a contextual history, perspective on the studies, and descriptions and preliminary NRHP assessments of Tribal resources to date. This section identifies Tribes that are known to have cultural ties or other Tribal interests in the Project Vicinity, identifies Tribal lands in the vicinity of the FERC Project Boundary, and identifies Tribal cultural or economic interests, including TCPs that may be affected by Proposed Action and existing Project O&M activities.

Preliminary information regarding implementation of the TRI-1 Study is presented in this section. The TRI-1 Study is ongoing, and the Draft Technical Report will be filed as confidential and privileged with the FLA.

6.14.1. Regulatory Context

This section was prepared to comply with Section 106 of the NHPA (16 USC § 470f) and its implementing regulations in 36 CFR Part 800, which requires federal agencies to take into account the effects of their undertakings on historic properties and afford the ACHP a reasonable opportunity to comment on such undertakings. This section was developed in collaboration with the Cultural and Tribal TWG that includes representatives from FERC, the California SHPO, the Inyo National Forest, and Tribes and Tribal representatives identified by the Native American Heritage Commission and through SCE's Tribal outreach.

The NHPA of 1966, as amended, acknowledges the importance of protecting this nation's heritage as a living part of community life. Section 106 of the NHPA requires federal agencies to consider the effects of their projects on historic properties listed in or eligible to be listed in the NRHP. The goal of that review process (detailed in 36 CFR Part 800) is to seek ways to avoid, minimize, or mitigate any adverse effects to important historic places. FERC's decision to issue a new license is considered a federal undertaking pursuant to 36 CFR § 800.16(y).

In the decades since the last relicensing of the Project, there has been increased federal recognition of the importance of Tribal cultural resources. In 1992, the NHPA was amended to clarify that properties that are historically or culturally significant to Indian Tribes could be eligible for listing on the NRHP. This action significantly increased the level of protection for Tribal cultural resources, and required federal agencies to consult with Indian Tribes regarding projects that might affect them. As the ACHP states, "The NHPA also requires that, in carrying out its responsibilities under the Section 106 review process, a federal agency must consult with any Indian tribe that attaches religious and cultural significance to historic properties that may be affected by the agency's undertakings (54 USC § 302706 [b])" (ACHP, 2021).

As defined in the NHPA (54 USC § 300308), a historic property or historic resource is any "prehistoric [precontact] or historic district, site, building, structure, or object included in, or eligible for inclusion on, the National Register, including artifacts, records, and material remains related to such a property or resource."

In other words, a Tribal resource must be eligible for listing in the National Register for Section 106 of the NHPA to apply. The criteria for National Register listing, especially as they pertain to Tribal resources, will be discussed in detail below, but three points are worth mentioning in this discussion of the regulatory context. First, in establishing guidelines for identifying and evaluating Tribal resources eligible for the National Register, the NPS recognizes that landscapes and places can hold shared community histories and memories that define a group (Frear et al., 2022). Second, Indian Tribes possess special expertise in assessing the eligibility of historic properties that may possess religious and cultural significance to them (36 CFR § 800.4[c][2]). And third, agencies and their designates have the authority and responsibility to consider the stewardship of Tribal resources in their decisions even if those resources are not determined eligible for listing on the National Register.

Proposed Project activities could potentially affect Tribal resources by endangering those qualities that make the property eligible for inclusion in the NRHP or that hold significant cultural value. Three main categories of Tribal resources that were identified in the TRI-1 Technical Study Plan are described below:

- Tribal places are locations associated with the ancestral past and places related to current gathering and/or hunting practices or other resource types.
- A TCP is a place or property 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 the community. Examples provided in National Register Bulletin No. 381, Guidelines for Evaluating and Documenting Identification of TCPs (NPS, 1998; NPS, 2023), include:
    - A location associated with the traditional beliefs of a Native American group about its origins, its cultural history, or the nature of the world;
    - A location where Native American religious practitioners have historically gone, and are known or thought to go today, to perform ceremonial activities in accordance with traditional cultural rules of practice; or
    - A rural community whose organization, buildings and structures, or patterns of land use reflect the cultural traditions valued by its long-term residents.
- Tribal government resources such as Indian allotments.

This section focuses on resources addressed under Section 106 of the NHPA. It does not consider other resources such as botanical or faunal resources, except to the extent that such resources are also part of a TCP that is subject to review under Section 106.

Although potential Project effects on these other resources might also be of concern to Tribal Stakeholders, they are addressed under other sections, such as Section 6.7, *Botanical Resources*. This section also does not address issues of environmental justice; as these are discussed in Section 6.16, *Environmental Justice*. Readers are referred to these studies for information regarding issues that are not subject to consideration under the NHPA.

6.14.2. Researcher Qualifications

The TRI-1 Study is being completed by individuals who meet the Secretary of the Interior's Professional Qualification Standards in Anthropology (36 CFR Part 61), are experienced at documenting Tribal resources in California, and hold the appropriate permits to conduct cultural resources work on lands managed by the Inyo National Forest.

Resource identification and study-communication efforts were managed by TEAM Environmental (TEAM) ethnographer, Lynn Johnson. Ms. Johnson earned a Bachelor of Arts in Anthropology and completed graduate coursework for a Master of Arts in Anthropology at California State University, Sacramento. She has worked with Tribal Groups in the Eastern Sierra region for 25 years. Within the last two decades, she has completed six multiyear ethnography/ethnohistory studies, which included interviews with Tribal Elders and experts, archival research, and report writing for a number of government agencies.

Mary Farrell holds a Master of Arts in Anthropology and provided administrative support to Ms. Johnson. As Heritage Program Manager for the Coronado National Forest in Arizona, Ms. Farrell was responsible for the Forest's compliance with the NHPA and served as the Forest's Tribal Liaison. As TEAM's senior archaeologist since 2016, she has assisted agencies in Tribal consultation, helped incorporate information obtained from Tribes into environmental documents, and served as co-facilitator for a Tribal Historic Preservation Officer-led National Register nomination.

Crystal West, Bachelor of Arts, Master of Arts in Processes in Anthropology, Stantec Consulting Services, Inc. (Stantec); Michael K. Lerch, Master of Arts in Anthropology, Michael K. Lerch & Associates; and Lynn Johnson, Bachelor of Arts, TEAM, collaborated on the Lee Vining (FERC Project No. 1388) and Rush Creek (FERC Project No. 1389) Tribal Resources reports due to the close proximity of the two projects.

6.14.3. Area of Potential Effect and Study Area

A project's APE is defined in 36 CFR § 800.16(d) as "the geographic area or areas within which an undertaking may directly or indirectly cause alterations to the character of use of historic properties, if any such properties exist." SCE defined the APE for the Project as all lands within the FERC Project Boundary (Figure 6.14-1) and defined the Study Area as a 5-mile radius of the APE.

The Study Area includes a 5-mile buffer around the APE to allow for additional background research on known cultural resources in the vicinity. This Study Area is a guide for archival research, development of the historic context and background statements, and interviews with Tribal representatives.

In a letter dated March 23, 2022, the SHPO, pursuant to 36 CFR § 800.4(a)(1), found the APE as defined to be sufficient for the undertaking (Polanco, 2022; SHPO Ref No. FERC_2022_0112_001).

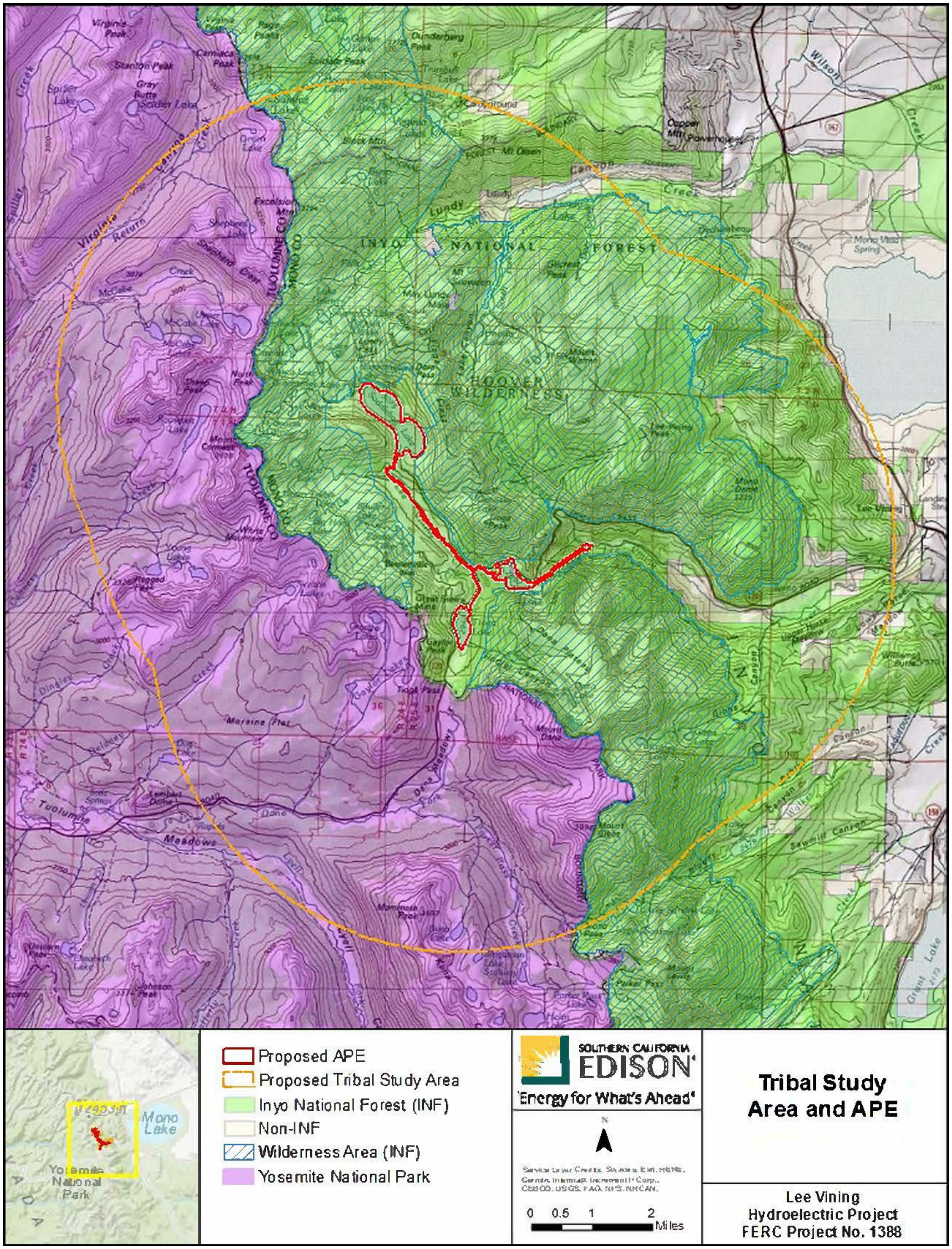


Figure 6.14-1. Area of Potential Effects and Study Area.

6.14.4. Study Objective

The principal goal of the TRI-1 Technical Study Plan is to assist FERC in meeting compliance requirements identified in 18 CFR Part 5 along with those requirements subject to Section 106 of the NHPA (as amended), among other federal laws and regulations, by determining if licensing of the Project would have an adverse effect upon Tribal resources, which may also include historic properties. FERC desires to know to what extent the existing Project construction and operation may have affected Tribal, cultural, or economic interests; may affect Tribal cultural sites in the future; and may have connected interests with other technical group studies. In addition to historic properties, which may be a type of Tribal resource, there are other Tribal resources that may be identified through archival research, oral interviews, field inspections, and government-to-government consultation. The study intends to ensure such places are described from a Tribal perspective and identify potential effects relating to O&M effects.

Research conducted to date suggests that an ethnographic overview/background of the Project Area has been minimal. Additional goals of the Study Plan implementation are to ensure that Tribal values and resources are identified and acknowledged from a Tribal perspective, and that an adequate baseline ethnohistory is developed. Similarly, ensuring that the land-managing agencies and any other stakeholder agencies have their program needs met with respect to the proposed Project APE is a goal of the work. Finally, it is anticipated that management issues will be identified to be described and developed in subsequent planning efforts for the life of the license.

Other goals and objectives are as follows:

- Identify and document Tribal resources identified within or immediately adjacent to the proposed APE.
- Conduct a thorough American Indian ethnographic/ethnohistoric survey of the proposed APE and Study Area.
- Conduct outreach and contact with Tribal governments and their representatives.

In addition, the TRI-1 Study:

- Assists in the identification of Tribal historic properties in the APE.
- Provides preliminary NRHP evaluations for Tribal resources.
- Provides an assessment of potential Project effects and integrates the findings with other studies where relevant.
- Informs the development of a HPMP.

6.14.5. METHODS

The TRI-1 Study used a multi-step strategy that included meetings, interviews, and field visits with interested Tribes, archival research, and a review of published literature relevant to the study. These combined efforts led to the identification of Tribal cultural resources and a preliminary NRHP evaluation.

6.14.5.1. Tribal Outreach, Interviews, and Field Visits

A good-faith effort was made 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). The investigation also followed the FERC regulations at 18 CFR § 2.1c, which includes a policy statement on consultation with Tribes in FERC proceedings.

6.14.5.2. Tribal Outreach

On June 1, 2020, SCE sent a letter to introduce the Project and invited Tribal participation in the Cultural and Tribal TWG. The TWG process is open to all interested parties including public agencies, Native American Tribes, and not-for-profit organizations, as well as individuals. The intent of the TWG meetings is to gather information on resources to help inform the NOI and PAD. Based on known information, SCE will work with Stakeholders to identify gaps in knowledge and key questions that should be addressed as part of the process.

On October 6, 2020, SCE held two public meetings to introduce the Project to Stakeholders and the public. On November 17, 2020, SCE held an initial TWG meeting to kick off the TWG process and introduce proposed TWGs. To date, SCE has held five Cultural and Tribal TWG meetings: January 27, 2021; February 24, 2021; March 31, 2021; May 26, 2021; and April 19, 2023. Notes and materials from these meetings are posted on the Project website (www.sce/leevining.com).

In addition, on April 21, 2021, SCE sent the draft PAD to the Tribes for review prior to submitting the PAD to FERC. The PAD contains sections that summarize what is known about cultural and Tribal resources in the Project Area. To ensure this information is accurate and complete, SCE provided advanced versions of the cultural resources and Tribal resources sections of the PAD to the Cultural and Tribal TWG. SCE stated that they are particularly interested in whether there are sources of information that should be included, whether the information is presented accurately, and if there are any particular sensitivities not yet considered about the sharing of information. In addition, SCE requested written comment to be received by May 19, 2021. No responses were received.

On January 20, 2023, via a letter, SCE renewed outreach to 18 Tribes and Tribal groups that were identified as having a potential interest in the Project, and introduced TEAM, which was brought on to complete the TRI-1 Study. Contact information for TEAM staff was provided in this letter. Follow-up letters and emails were sent, inviting Tribes to participate in the relicensing process, with further outreach attempted by phone. Outreach was initiated with the following Tribes and Tribal groups:

- American Indian Council of Mariposa County (also known as the Southern Sierra Miwuk Nation), Mariposa, CA
- Antelope Valley Paiute Tribe, Coleville, CA
- Big Pine Paiute Tribe of Owens Valley, Big Pine, CA
- Bishop Paiute Tribe, Bishop, CA
- Bridgeport Indian Colony, Bridgeport, CA
- Mono Lake Indian Community (Mono Lake Kootzaduka'a [also spelled Kutzadika[a]]) Tribe of California and Nevada), Lee Vining, CA
- Mono Lake Kootzaduka'a Indian Community Cultural Preservation Association, Lee Vining, CA
- Fort Independence Indian Community of Paiute Indians, Independence, CA
- Lone Pine Paiute-Shoshone Tribe, Lone Pine, CA
- North Fork Mono Tribe of California, Clovis, CA
- North Fork Rancheria of Mono Indians, North Fork, CA
- Timbisha Shoshone Tribe, Bishop, CA
- Tuolumne Band of Me-Wuk Indians of the Tuolumne Rancheria of California, Tuolumne, CA
- Utu Gwaitu Paiute Tribe of the Benton Paiute Reservation, Benton, CA
- Walker River Paiute Tribe, Schurz, NV
- Washo Tribe of Nevada and California, Gardnerville, NV
- Yerington Paiute Tribe of the Yerington Colony and Campbell Ranch, Yerington, NV
- Yosemite-Mono Lake Paiute Indian Community

At the April 19, 2023, Cultural and Tribal TWG meeting, two Tribes participated.

TEAM's outreach efforts resulted in invitations from Charlotte Lange, Mono Lake Kootzaduka'a Tribal Chairperson, for several consultation meetings with members of the Mono Lake Kutzadika[a] (Kootzaduka'a) Tribe. In addition, the TEAM ethnographer accepted an invitation to attend the June 2023 Kootzaduka'a Days in Lee Vining. One

Tribal member agreed to a phone interview and a subsequent field visit. The Bishop Paiute Tribe responded positively to a request for potential interviewees, and a member of the Antelope Valley Paiute Tribe, Colville, agreed to a field visit. Other Tribes listed above either did not respond, declined to participate, or deferred to the Mono Lake Kutzadika'a (Kootzaduka'a) Tribe.

6.14.5.3. Interviews

Two Tribal members, one from the Mono Lake Kutzadikaᵃ (Kootzaduka'a) Tribe and one who is a member of the Bishop Paiute Tribe but grew up near the Study Area and has Kutzadikaᵃ ancestors, agreed to be interviewed in 2023, one by phone and the other in person at TEAM's office in Bishop, CA. Both interviewees provided additional information for this TRI-1 Study during subsequent meetings, either in person, by phone, or in emails.

Because the Mono Lake Kutzadikaᵃ (Kootzaduka'a) Tribe is not federally recognized and because of the wide-ranging kinship ties they had with neighboring groups, many Mono Lake people are enrolled on other federally recognized Tribes due to these and other historical factors. As noted in *Voices of the People*: "As a result of the 1939 Owens Valley Land Exchange, a board of trustees was created to oversee the granting of land assignments and housing. A good number of Mono Lake Paiutes moved to the Bishop Reservation because the land exchange opened membership to homeless Indians in Inyo and Mono counties" (NPS, 2019).

6.14.5.4. Field Visits

Due to lingering snow in 2023, as well as swift water and flooding from snowmelt, scheduling field visits was challenging. In the fall of 2023, two outings to the Poole Powerhouse and vicinity were conducted. Due to inclement weather during one field visit and lack of time during the other, the higher elevation areas of the Project APE and Tribal Study Area were not visited except for one brief stop at Ellery Lake.

6.14.5.5. Collaboration with Colleagues

The Lee Vining Creek Project and the Rush Creek Project are both within the traditional territory of the Kutzadikaᵃ (Kootzaduka'a) Tribe. Because the environmental and historical contexts for each project are similar, the ethnographers for both projects shared background information that was common to both study areas. As such, the contributions of all the coauthors are acknowledged as contributions to both draft reports.

6.14.5.6. Literature Review

Published ethnographies for the Mono Lake region are somewhat limited when compared to other parts of California and the Great Basin; therefore, ethnographic information from other published sources was also used to prepare this Tribal Resources section, as well as the TRI-1 Draft Technical Report that will be filed as confidential and privileged with the FLA. The following is a summary of what information the ethnographies provided. Table 6.14-1 includes a list of the informants that were consulted in each ethnography.

Table 6.14-1. List of Previous Ethnographies and Tribal Consultants

Ethnographer(s)	Fieldwork Date(s)	Consultant Name(s)	Location	Reference(s)
C. Hart Merriam	1903, 1934–1938	Mono Lake Koo-tsab'-be-dik-ka-kuddy	Mono Lake (Lee Vining)	Merriam, 1900, 1901, 1955a, 1955b, 1979a, 1979b
	1934–1938	Bridgeport Paiute	Bridgeport	
Julian H. Steward	1927–1931	Bridgeport Tom (60 years old)	Mono Lake	Steward, 1933, 1936
		Harry Tom (son of Bridgeport Tom)		
		Joe McBride (45 years old)		
		Big Mike (about 60 years old)		
Frederick S. Hulse	1935	Tina Charlie	Mono Lake, Bridgeport	Busby et al., 1980; Hulse, 1935 (Bancroft Library)
		Silas B. Smith		
		Bridgeport Tom		
		Jake Gilbert		
		Jack Lundy		
		Joe Lent		
		Susie Jim		
Emma Lou Davis	1959–1960	Carrie Magowan Bethel	Lee Vining, Bishop	Davis, 1965
		Minnie Magowan Mike (Carrie's older sister)		
		Casuse Mike (Minnie's husband)		
		Nellie John Reynolds		
		Florence Williams (Nellie's daughter)		
		Willie Williams (Florence's husband)		
		Harry Blaver, Jr.		
		Elma Hess Blaver (Harry's mother)		
		Stanley Hess (Elma's brother)		
Ilene Mandelbaum, Mono Lake Committee	1992	John Dondero	Lee Vining (from Rush Creek)	Durant, 1991; Dondero, 1992; Hess and Andrews, 1991; Jones & Stokes Associates, 1993
Emilie Strauss, Jones & Stokes Associates	1991	Jessie Durant	Bishop (from Rush Creek)	
I. Mandelbaum and E. Strauss, Mono Lake	1991	August Hess and Jerry Andrews	Andrews home, Mono Lake area	

Ethnographer(s)	Fieldwork Date(s)	Consultant Name(s)	Location	Reference(s)
Committee and Jones & Stokes Associates				
Judith Marvin, Julia Costello	1993 (6/3/1993)	Jerry Andrews	Lee Vining	Marvin and Costello, 1993; McGuire and Costello, 1994
	1993 (6/3/1993)	John Dondero	Lee Vining	
	1993 (6/3/1993)	August Hess	Lee Vining	
	1993 (6/4/1993)	Alta Sam Lange	Lee Vining	
	1993 (6/10/1993, 12/6/1993)	Joseph Sam	Lee Vining	
	1993 (11/18/1993)	B. Gurule	Lee Vining	
Helen McCarthy	1995–1996	Jessie Durant (elder Kutzadika[a] [Kootzaduka'a] speaker)	Bishop (from Rush Creek)	McCarthy, 1996
		Augie Hess (80+ year old cousin of Jessie's)	Lee Vining (from Rush Creek)	
		Elma Hess Blaver (sister of Augie)	Lee Vining (from Rush Creek)	
		Jerry Andrews	Lee Vining	
		Richard Williams	Lee Vining	
Shelly Davis-King	1996–2022	Ongoing, multiple projects	Mono, Inyo Counties, west side	Davis-King, 1996, 1998, 2010
	August 9, 2005	Bridgeport Cultural Committee	Bridgeport	Davis-King, 2010
	March 2008	Raymond Andrews	Bishop (from Mono Lake)	Davis-King and Snyder, 2010
	1996, 2007, 2008	Lucy Parker	Mono Lake	Davis-King and Snyder, 2010

Literature reviewed for the TRI-1 Study includes Davis (n.d., 1962, 1963, 1964, 1965); Davis-King (2007, 2010); Davis-King and Snyder (2010); Marvin and Costello (1993); McCarthy (1996); and NPS (2019), as well as Fletcher (1982) and Marks (2023) for information on Mono Basin ethnohistory, and Bates and Lee (1990) for information on prominent Mono Basin basket weavers in the 1900s. Information from Fowler (1989) and Fowler and Liljeblad (1986) was used to fill in gaps in ethnographic data for the Mono Basin.

Julian Steward included information from four Mono Lake consultants in *Ethnography of the Owens Valley Paiute* (1933) and published several of their stories in *Myths of the Owens Valley Paiute* (1936), including a version of the Big Fish story related by Bridgeport Tom.

Emma Lou Davis worked with Mono Lake Kutzadika[a] (Kootzaduka'a) Elders and their families in 1959 and 1960 while a graduate student at the University of California, Los

Angeles. In the dedication to her manuscript "Studies in the Region of Mono Lake, Mono County California," Davis (n.d.) writes: "To Nellie Reynolds and Carrie Bethel, women of the Mono Lake Paiute: afternoons in summer fishing and winter evenings with a tape-recorder. I will never forget you…." This unpublished manuscript became the basis for two of Davis's publications: "An Ethnography of the Kuzedika Paiute of Mono Lake, Mono County, California" (Davis, 1965), and "An Archaeological Survey of the Mono Lake Basin and Excavations of Two Rockshelters, Mono County, California" (Davis, 1964).

Davis's 1965 ethnography, although brief, is the most exhaustive study available and contains valuable information on Kutzadika[a] (Kootzaduka'a) lifeways, as well as some historical data. In addition to Nellie Reynolds and Carrie McGowan Bethel, other collaborators mentioned by Davis in her ethnography include Carrie Bethel's older sister, Minnie McGowan Mike, and Minnie's husband, Cause Mike; Nellie Reynolds's daughter, Florence Williams, and Florence's husband, Willie Williams; and Harry Blaver Jr. and his mother, Emma Hess Blaver, as well as Emma's brother, Stanley Hess. Tragically, as detailed below, Davis's field notes, tape recordings, photos, maps, and other original materials from her work with the Mono Lake Kutzadika[a] (Kootzaduka'a) are no longer extant.

Davis also published two professional papers related to her work in the Mono Basin, "Hunter-Gatherers of Mono Lake" in 1962 and "The Desert Culture of the Western Great Basin: A Lifeway of Seasonal Transhumance" in 1963.

More recently, the Mono Lake Committee conducted interviews with Tribal consultants including John Dondero (1992), Jessie Durant (1991), and August Hess and Jerry Andrews (1991) that were used in an environmental impact report assessing Mono Lake water rights (Jones & Stokes Associates, 1993). Marvin and Costello (1993) interviewed several of the same Tribal consultants for a historic resources study of the Frank and Betsy Sam homestead on Parker Creek that was conducted for a California Department of Transportation road-widening project along U.S. Route 395. In addition to Dondero, Andrews, and Hess, Marvin and Costello also interviewed Alta Sam Lange, Joseph Sam, and B. Gurule.

Helen McCarthy conducted ethnographic and ethnohistoric research in the mid-1990s for a study to complement an archaeological inventory of 2,700 acres on the lower reaches of the Lee Vining, Walker, Parker, and Rush Creek drainages (McCarthy, 1996). These studies were conducted under contract to the LADWP for the proposed Mono Streams Restoration Project. Per Mono Lake Basin Water Rights Decision 1631 issued by the State Water Resources Control Board in September 1994, the Mono Streams Restoration Project required LADWP to restore segments of select streams feeding Mono Lake from the point of LADWP's water diversions to the shore of Mono Lake. In addition, this decision mandated that the lake be allowed to rise to a "management level" of 6,392 feet amsl. Although this is much lower than the pre-diversion level of 6,417 feet, it is an improvement over the historic low of 6,372 feet and the 6,340-foot level predicted if LADWP continued its diversions without restraint (Mono Lake Committee, 2024).

In 1995, McCarthy consulted with five Kutzadika[a] (Kootzaduka'a) individuals who were intimately familiar with the Project Area, including Jessie Durant, her cousins, Auggie Hess and Emma Hess Blaver, and two younger men, Jerry Andrews and Richard Williams (McCarthy, 1996). All three Elders spent their entire lives in the Mono Lake area, with a significant part of their childhoods spent with their grandparents at the settlement on Rush Creek. McCarthy reports that Jessie Durant was a fluent speaker of the Mono Lake dialect. The Elders were all knowledgeable about traditional Kutzadika[a] (Kootzaduka'a) lifeways and well-aware of the effects historic events had on traditional subsistence and settlement patterns and other aspects of their culture.

Shelly Davis-King has conducted important research related to the current TRI-1 Study for more than a decade. A synthesis of information on the Indigenous People of Mono County is found in Davis-King (2007, 2010). Information on trails within the Tribal Study Area for the Project, as well as the wider region, is found in Davis-King and Snyder (2010).

The TRI-1 Draft Technical Report (*to be filed with the FLA*) draws heavily from *Voices of the People: The Traditionally Associated Tribes of Yosemite National Park* (NPS, 2019). This book was published as a collaborative effort between the Seven Affiliated Tribes of Yosemite (the North Fork Rancheria of Mono Indians of California, the Southern Sierra Miwuk Nation, the Picayune Rancheria of the Chukchansi Indians, the Bridgeport Indian Colony, the Mono Lake Kootzaduka'a Tribe, the Tuolumne Band of Me-wuk Indians, and the Bishop Paiute Tribe) and the NPS. This collaboration began as a way for Tribal members to tell their own stories in their own voices. As stated by Superintendent Michael Reynolds in the forward to the publication, "there are no better storytellers than the people themselves." This collaborative effort between the Seven Affiliated Tribes and the NPS resulted in a collection of "first-person narratives, photographs, personal family stories, and academic and historical information" (NPS, 2019).

6.14.5.7. Archival Research

Archival research was conducted to obtain unpublished ethnographic data to supplement information from published ethnographic studies and interviews with Tribal members. The archival data, used in the preparation of several chapters of the TRI-1 Draft Technical Report (*to be filed with the FLA*), helped establish a context for identifying and evaluating Tribal resources. Archival materials were found in widespread archival repositories. Collections accessed during archival research conducted for the Project relicensing, during previous projects undertaken by the TEAM ethnographer, or available online, include the following.

ANCESTRY.COM

Subscribers to Ancestry.com can access U.S. federal census records from Record Group (RG) 29, as well as records of the U.S. Census Bureau, which are held at the National Archives and Records Administration in Washington, D.C. Census records confirmed the identities of Nüümü families that lived in or near the Tribal Study Area between 1900 and 1950. These records provide a wealth of information of relevance to the current TRI-1 Study, including family relationships, the date and, in some cases, place of everyone's birth, place of residence, whether attending school, current occupation, and land ownership status.

BANCROFT LIBRARY, UNIVERSITY OF CALIFORNIA, BERKELEY

Three important sources of unpublished ethnographic information relevant to this section are archived in the Bancroft Library, University of California, Berkeley, including:

- The C. Hart Merriam Papers (1898 to 1938) contain Mono Lake Paiute vocabularies and ethnogeography information, which was reviewed for place and plant and animal names used to prepare maps and tables included in both the Lee Vining and Rush Creek Tribal Resources Technical Study Reports.

- The C. Hart Merriam Collection of Native American Photographs (circa 1890 to 1938) contains photographs of people from the Mono Basin, some of which are used in the Ethnographic Overview and Ethnohistory chapters of the Tribal Resources Technical Study Reports for both projects.

- The Hulse and Essene Manuscript Collection (1935 to 1936) contains ethnographic material from interviews with Mono Lake and Bridgeport Paiute Elders compiled by Frederick Seymour Hulse. Hulse, a physical anthropologist by training, came to California in 1934 to work with Alfred Kroeber, a cultural anthropologist at the University of California, Berkeley (Giles, n.d.). In the summer of 1935, Kroeber sent Hulse to places in the Eastern Sierra to work with Nüümü Elders and their relatives to gather information on a wide array of topics as part of the Works Progress Administration's (WPA) Great Depression program. Hulse hired young, bilingual Nüümü men and women to interview their elderly relatives and transcribe the interviews into English. Because the Elders were interviewed by relatives whom they trusted, they likely shared information they would not have if the interviewer had been a nonnative anthropologist.

Elders from the Lee Vining and Bridgeport areas interviewed for the WPA project include:

- Tina Charlie (born about 1869; collected and transcribed by Helen August and Luella Turner)

- Jake Gilbert (born about 1865; collected and transcribed by Luella Turner)

- Susie Jim (born about 1845; collected and transcribed by Lillian August)

- Joe Lent (born about 1887; collected and transcribed by Helen and Lillian August)

- Jim (Jack) Lundy (Me-wuk, born about 1876 at Deer Flat in Tuolumne County but married two Kutzadika[a] [Kootzaduka’a] sisters who were born in Mono County where he remained the rest of his life; collected and transcribed by Helen and Lillian August)

- Silas B. Smith (born at Mono Lake about 1874; collected and transcribed by Lillian August)

- Bridgeport Tom (born at Bridgeport about 1860 but married two Kutzadika[a] (Kootzaduka'a) sisters who were both born at Mono Lake; Tom received an allotment on Rush Creek; collected and transcribed by Justine Brown)

The Nüümü interviewed for the WPA project are the ancestors of Kutzadika[a] (Kootzaduka'a) Tribal members and/or members of other Tribes with ties to the Project Area.

This collection of interview manuscripts (Hulse, 1935), which is unique in the number of women participating, contains a rich body of cultural knowledge. The manuscripts cover topics such as Mono Lake, east-west travel on Nüümü trails, the water of the Sierra Nevada, plant and animal resource procurement and processing, life stories, stories from the beginning of time, and more. Material from this collection was not used extensively due to time and budget constraints, as well as out of respect for the desire of the Nüümü of the Eastern Sierra Region to protect sensitive cultural material. Some of the Big Fish stories discussed in the TRI-1 Technical Report (*to be filed with the FLA*) are from this collection.

BUREAU OF LAND MANAGEMENT GENERAL LAND OFFICE LAND PATENT RECORDS

GLO land patents for Paiute allotments in the vicinity of the Tribal Study Area were obtained by searching the BLM GLO Land Patent Search online database (BLM, n.d.). 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. While none of the Paiute allotments are within the Tribal Study Area (one is just outside the Study Area boundary), the allotments will be discussed briefly in the TRI-1 Draft Technical Report (*to be filed with the FLA*) at the request of Mono Lake Kootzaduka'a Tribal Members. As discussed below, most of the allotments are in between the Lee Vining Creek and Rush Creek study areas.

EASTERN CALIFORNIA MUSEUM, INDEPENDENCE

Copies of the Inyo National Forest Archives are housed at the Eastern California Museum in Independence, California. Time did not allow a thorough inspection of this large collection, but some information from these archives was used in the preparation of the Ethnohistory chapter of the TR-1 Draft Technical Report (*to be filed with the FLA*).

GREAT BASIN INSTITUTE ARCHIVES, UNIVERSITY OF NEVADA, RENO

The Great Basin Institute Archives has files on eight of the Indian allotments in the Mono Basin (Great Basin College, n.d.). Information found in these files was used to prepare the Ethnohistory section of the TR-1 Draft Technical Report (*to be filed with the FLA*).

MATURANGO MUSEUM, RIDGECREST

Maturango Museum is the repository for 21 boxes of material from the Emma Lou Davis/Great Basin Foundation collection, which was originally housed at Mill Creek Station near Bishop. The museum has several copies of Davis's undated manuscript

"Studies in the Region of Mono Lake, Mono County California," which formed the basis for two of her publications: "An Ethnography of the Kuzedika Paiute of Mono Lake, Mono County, California" (Davis, 1965) and "An Archaeological Survey of the Mono Lake Basin and Excavations of Two Rockshelters, Mono County, California" (Davis, 1964). The Kutzadika[a] (Kootzaduka'a) Tribe had hoped Davis's original field notes, taped interviews, photographs, and other materials related to her ethnography study could be located as part of the archival research conducted for this section. Unfortunately, Davis had those materials at her home in Los Angeles while working on her ethnography and archaeology reports, and when her house burned to the ground in 1961, the field notes, tape recordings, photographs, maps, drawings, catalog records, and other materials associated with her work in Mono County were tragically destroyed (Davis, n.d.). The collection at Maturango Museum otherwise consists of materials that postdate Davis's work in Mono County.

MONO BASIN HISTORICAL SOCIETY, LEE VINING

The Mono Basin Historical Society has photographs, articles, and reports of interest to the TRI-1 Study.

MONO BASIN CLEARING HOUSE DIGITAL LIBRARY

The Mono Basin Clearing House has records of interviews conducted in 1991 and 1992 with Jerry Andrews and the late Mr. Auggie Hess, two Mono Lake Kutzadika[a] (Kootzaduka'a) gentlemen intimately familiar with the Lee Vining Creek and Rush Creek areas; the late Mrs. Jessie Durant, who grew up on her grandfather's allotment on Rush Creek and was also a knowledgeable Tribal expert; and the late John Dondero, Jr., who grew up on Rush Creek and the Farrington Ranch.

NATIONAL ARCHIVES AND RECORDS ADMINISTRATION, SAN BRUNO

The National Archives and Records Administration, San Bruno, has several important collections that were used in the preparation of this section. Original documents related to Indian allotments, made under the provisions of the Dawes Act of 1887, are found in Land Transaction Case Records, RG 75, Bureau of Indian Affairs (BIA). These records document the period during which an allotment was held in trust by the BIA. Applications for Enrollment with the Indians of the State of California under the Act of May 18, 1928 (45 Stat. L. 602), also in RG 75, BIA, contain a wealth of genealogy and other information.

C. HART MERRIAM COLLECTIONS AT UNIVERSITY OF CALIFORNIA, DAVIS DEPARTMENT OF ANTHROPOLOGY MUSEUM AND LIBRARY OF CONGRESS

C. Hart Merriam, a biologist who became Director of the U.S. Biological Survey in 1885 at the age of 30, was one of the great naturalists of his generation. From the beginning of his tenure with the Biological Survey, Merriam's driving interest lay in ascertaining the geographical distribution of the fauna of the North American continent. By 1890, Merriam had laid the foundation for the "life zone concept," which he is generally credited with developing and which he formally outlined in 1892. During his explorations in California, Merriam shifted his interest almost entirely to recording ethnographic data, including language, and collecting utilitarian baskets.

Merriam (n.d.) conducted fieldwork in the Mono Basin between 1900 and 1934, camping on Lee Vining Creek and staying at the Farrington Ranch north of Walker Creek while seeking out Nüümü encampments and working with the people there to document names of plants and animals and gather other information. His fieldwork in the Mono Basin was brief, but the information he was able to gather is valuable, nonetheless. Some of the data Merriam collected were published posthumously in *Studies of California Indians* (Merriam, 1955) and *Ethnographic Notes on California Indian Tribes* (Merriam, 1966).

Merriam's basket collection and catalog cards, as well as a photocopy of his California journals (Merriam, n.d.), are archived at the University of California Davis Department of Anthropology Museum, which is currently in the process of transcribing Merriam's California journals. Merriam's original field journals are housed in the Library of Congress Manuscript Collection, Washington, D.C. As noted above, Merriam's language schedules and photographs are archived at the University of California, Berkeley.

NORTHWESTERN UNIVERSITY LIBRARIES, ILLINOIS

The Charles Deering McCormick Library of Special Collections archived at Northwestern University Libraries has a collection of photogravure prints of Edward S. Curtis photographs from the Frederick Webb Hodge Set of The North American Indian, which includes prints of photographs taken by Curtis in the Mono Lake area in 1924. Gelatin silver prints of these same photographs are available from the Library of Congress.

Altogether, ethnographic and ethnohistoric inquiries into the Kutzadika[a] (Kootzaduka'a) culture span more than 125 years and represent the contributions of dozens of Tribal consultants.

6.14.6. ETHNOGRAPHIC OVERVIEW

The Project is in the traditional homeland of the Mono Lake Kutzadika[a] (Kootzaduka'a), who have inhabited the Mono Lake Basin and surrounding area since time immemorial and never ceded this homeland. The Kutzadika[a] (Kootzaduka'a) are the southernmost band of the Nüümü, called the Northern Paiute by anthropologists. The Nüümü (Northern Paiute) are a geographically widespread linguistic group in the western Great Basin with a homeland encompassing approximately 70,000 square miles (Fowler and Liljeblad, 1986; McCarthy, 1996). This vast homeland, which extends from an area just south of Mono Lake north into Oregon and Idaho, west into the Sierra Nevada, and east to the Little Humboldt and Reese Rivers, is home to approximately 22 Nüümü (Northern Paiute) groups, which, although connected by language, are somewhat culturally diverse due in part to differences in local environments.

Updated information for this section is being reviewed and will be provided in the FLA.

6.14.7. Study Results

6.14.7.1. Tribal Lands

Tribal lands are defined as all lands within the boundaries of an Indian reservation and all dependent Indian communities (36 CFR § 800.16[x]), and any lands held in trust for any Tribe by the United States 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.

6.14.7.2. Tribal Resources and Interests

Tribal resources and interests have been identified within the APE and Study Area. Continued consultation with participating Tribes, USFS, SHPO, and FERC is ongoing. *Updated information for this section is being reviewed and will be provided in the FLA*.

6.14.7.3. Traditional Cultural Properties

Any potential TCPs identified by the TRI-1 Study will be reviewed by Tribes associated with the TCP, USFS, SHPO, and FERC. *Updated information for this section is being reviewed and will be provided in the FLA*.

6.14.8. Potential Adverse Effects and Issues

6.14.8.1. Current Resources Management Plan

As part of the previous relicensing, SCE prepared an HPMP for the Project (White, 1990). The plan identifies specific measures undertaken by SCE to avoid adverse effects to the NRHP-eligible properties located within the FERC Project Boundary and various programmatic measures that SCE is required to implement.

6.14.8.2. Current Potential Adverse Effects and Issues on Tribal Resources

FERC's decision to issue a new license is considered an "undertaking" pursuant to 36 CFR § 800.16(y), and the NHPA requires federal agencies to consider the effect of undertakings on historic properties and provide the ACHP an opportunity to comment. Project O&M could potentially affect cultural and Tribal resources, TCPs, and other resources of traditional, cultural, or religious importance to the Native American community.

The purpose of identifying effects is to determine which resources may have heritage values compromised or altered, and to aid in the development of management/protection measures that would be incorporated into the HPMP for the Project. PME measures will be developed in consultation with the Stakeholders and Tribes and will be incorporated into the HPMP.

TRIBAL RESOURCES

Updated information for this section is being reviewed and will be provided in the FLA.

NO ACTION

Under the No Action, SCE would continue to operate and maintain the Project in accordance with the terms and conditions of the existing FERC license. *Updated information for this section is being reviewed and will be provided in the FLA*.

PROPOSED ACTION

Under the Proposed Action, SCE will continue O&M activities at the Project in accordance with the terms and conditions of the license to be issued for the Proposed Action. The Proposed Action includes implementation of new MIFs, and other resource management plans. *Updated information for this section is being reviewed and will be provided in the FLA*.

6.14.8.3. Consistency with Inyo National Forest Land Management Plan

SCE reviewed the desired conditions in the Inyo National Forest LMP for consistency with the Project (USFS, 2019). Desired conditions with which the Project is consistent include (USFS, 2019):

- TRIB-FW-DC 01: The Inyo National Forest staff recognizes Native American needs and viewpoints and fosters a robust relationship with federally and non-federally recognized Tribes and related groups with which it consults. Inyo National Forest personnel, including but not limited to line officers, departmental staff, archaeologists, historians, and Tribal liaisons, consult and communicate with Tribal leadership, Tribal Historic Preservation Officers, traditional religious practitioners, traditional gatherers, Tribal members, and other Tribal organizations.
- TRIB-FW-DC-02: The Inyo staff coordinates with Tribes in managing traditional cultural properties, resources, and sacred sites where historic preservation laws alone may not adequately protect the resources or values.
- TRIB-FW-DC 03: Native Americans have access to areas that provide them an opportunity to practice traditional, cultural, and religious lifeways, such as plant gathering, fishing, hunting, and ceremonial activities that are essential to maintaining their cultural identity and the continuity of their culture.

6.14.8.4. Proposed Mitigation and Enhancement Measures

The TR-1 Study is ongoing as of the filing of this DLA. Potential effects related to this resource will be discussed in the FLA. In 1990, SCE developed an HPMP in compliance with National Historic Preservation Act Section 106 (White, 1990). The HPMP required archaeological and historic inventory of the Project Area and development of appropriate management measures. The HPMP developed management strategies to avoid effects on historic properties, monitoring of historic properties and continual consultation with agencies (White, 1990).

As part of the Proposed Action, SCE intends to update the HPMP (PME-5), which will consider the direct and indirect effects of continued Project O&M for the NRHP listed or eligible Tribal resources, including public recreation activities that may have an adverse effect on historic properties. The current licensing efforts also included a Cultural Resource (CUL-1) Study, which included one study element covering the archaeology and built-environment resources; the results of these studies will be used to develop the updated HPMP that addresses the management and treatment of cultural and Tribal resources that have been determined eligible for inclusion in the NRHP or remain unevaluated within the APE over the term of the new license. The HPMP will provide guidelines for managing or monitoring archaeological site conditions, avoidance measures for TCPs and other cultural sites, and consultation and reporting requirements. SCE is developing the updated HPMP and intends to file it with the FLA, following consultation with the appropriate Stakeholders and Tribes.

6.15. SOCIOECONOMIC RESOURCES

This section provides the best available information related to socioeconomics within the Project Area, and any potential effects on socioeconomic resources that may occur as a result of the Proposed Action.

6.15.1. AFFECTED ENVIRONMENT

The Project is located approximately 5 miles west of the town of Lee Vining in Mono County, California. Lee Vining is an unincorporated town with a total area of approximately 5 square miles, located at elevation 6,781 feet (see Figure 6.11-1). The surrounding area has almost no development aside from the roads that traverse the vicinity. Tuolumne, Mariposa, Madera, and Fresno Counties border to the west; Alpine County borders to the north; and Inyo County borders to the south. Transportation through the county is provided by an extensive road system: "U.S. Highways 6 and 395 traverse in a general north-south direction, while numerous scenic byways and county roads run east-west within the county" (CEDD, 2021). The following summary of socioeconomic data for the town of Lee Vining and Mono County includes general land use, population patterns, average household income, and Project Vicinity employment.

6.15.1.1. General Land Use

Land in the Project Area is located on Lee Vining and Glacier Creeks, and primarily on federal land within the Inyo National Forest. The predominant land cover types are evergreen forested lands, shrub/scrub, barren, grassland/herbaceous, and open water (MRLC Consortium, 2023) (see Figure 6.11-2 and Table 6.11-2).

The Project Area is managed by the USFS under the Inyo National Forest LMP for a variety of land uses, including recreation, wilderness use, maintenance, improvement of habitat, rangeland, timber production, and the exploration and development of mineral resources, particularly energy resources (USFS, 2019).

See Section 6.11, *Land Use*, for a more detailed discussion on land use, land cover, and land management.

6.15.1.2. Population Patterns

Lee Vining is an unincorporated community in Mono County with a growing population. It is classified as a census-designated place for the purposes of socioeconomic data collection and statistical purposes under the U.S. Census Bureau. Census-designated places are a statistical geography representing closely settled, unincorporated communities that are locally recognized and identified by name. Between 2017 and 2018, the population of Lee Vining declined from 102 residents to 89, a 12.7 percent decrease (Data USA, 2021). By 2019, the U.S. Census Bureau estimates placed the population of Lee Vining up again to 98 persons. Between 2016 and 2019, the town's population fluctuated, but generally numbers of residents stayed between 90 and 95 persons (U.S. Census, 2019). The population of Lee Vining grew from 59 in 2020 (U.S. Census, 2020) to 106 in 2021 (U.S. Census, 2021), a 79.7 percent increase. The population continued to grow to 594 in 2022 (U.S. Census, 2022a). The median age of Lee Vining is 33.7 (Data USA, 2021).

The next largest towns near Lee Vining are Mammoth Lakes (7,253 people), Bridgeport (408 people), Yosemite Valley (1,737 people), and June Lake (302 people) (U.S. Census, 2022a). Table 6.15-1 summarizes the population estimates for Lee Vining, Mono County, and the State of California.

Table 6.15-1. Comparison of Changes in Total Populations in Lee Vining, Mono County, and the State of California

Location	2010 Census Population	2019 Populations Estimates	2020 Census Population	2022 Population Estimates	% Change 2019–2022
Lee Vining	222	98	59	594	506.12%
Mono County	14,202	14,310	13,195	13, 219	-7.6%
California	37,253,956	39,283,497	39,538,223	39,356,104	0.2%

Source: U.S. Census 2010, 2019, 2020, 2022b, 2022c, 2023

Figure 6.15-1 shows population density throughout Mono County and Tuolumne County, the county to the northwest of Lee Vining. The population of Mono County was approximately 13,219 in 2022 (U.S. Census, 2024a) with a population density of 4.3 people per square mile at the time of the 2020 Census (U.S. Census, 2023). The population of Tuolumne County was approximately 54,993 in 2022 (U.S. Census, 2024b) with a population density of 25 people per square mile at the time of the 2020 Census (U.S. Census, 2023).

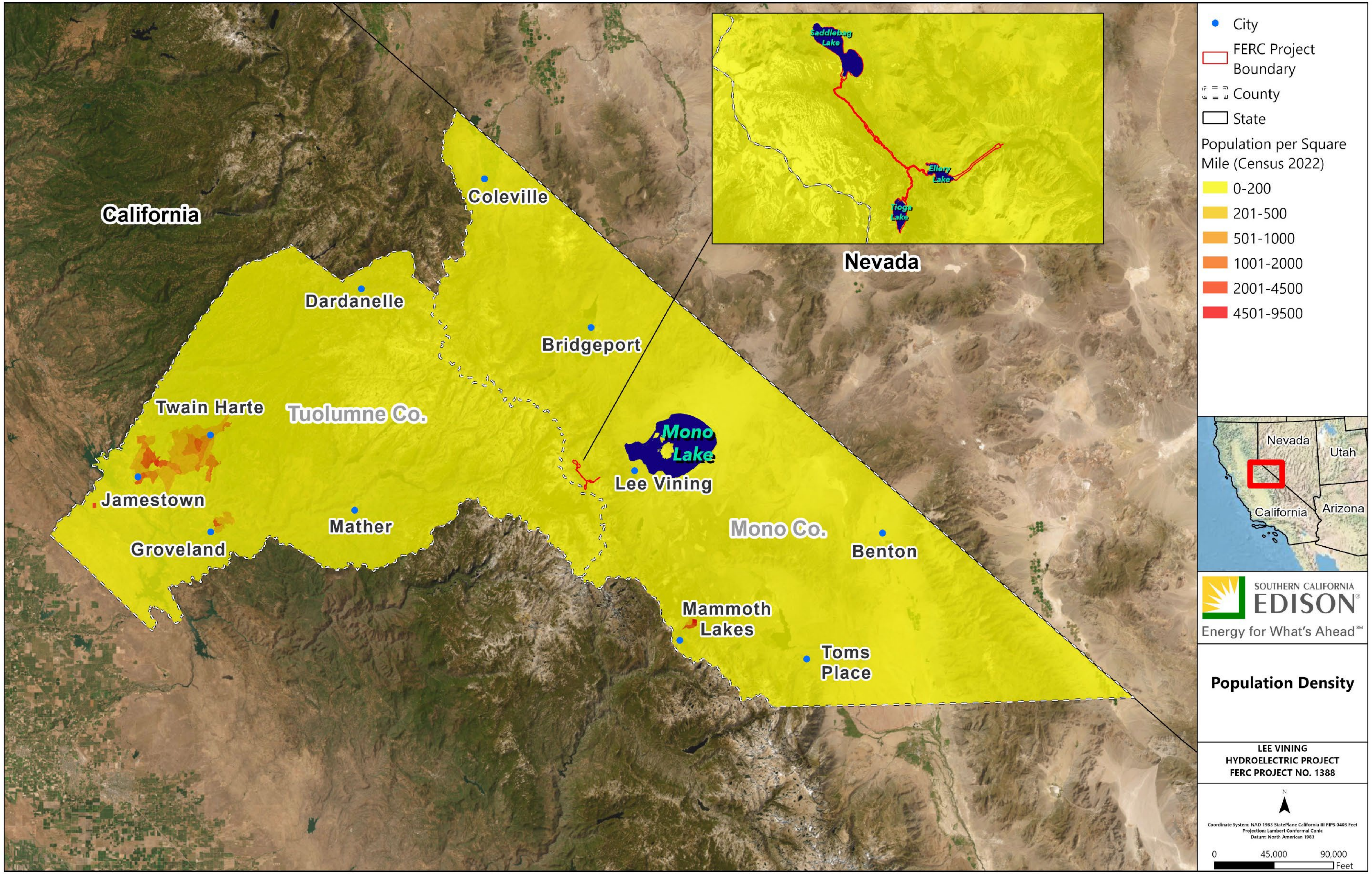


Figure 6.15-1. Population Density.

6.15.1.3. Households/Family Distribution and Income

The median income for a household in Mono County is estimated to be $82,038, (U.S. Census, 2022d) with an average household size of 2.33 people (U.S. Census, 2022e). The U.S. Census Bureau (2022f) estimates that 1,478 (11 percent) residents in Mono County live below the poverty level. The median income for a household in Tuolumne County is estimated to be $70,432, (U.S. Census, 2022g) with an average household size of 2.26 people (U.S. Census, 2022h). The U.S. Census Bureau (2022i) estimates that 5,887 (11 percent) residents in Tuolumne County live below the poverty level.

6.15.1.4. Project Vicinity Employment

Lee Vining is a “Gateway Community” to Yosemite National Park and the economy relies largely on tourism, according to Mono County Economic Development (MCED, 2023). The Profile of Mono Visitors and Economic Impacts of Tourism includes data from 2018, when Mono County had an estimated 6,500 jobs, with an estimated 5,340 jobs considered full-time in the tourism sector—up 18 percent from 2008 with 4,500 jobs (PMVEIT, 2019). The annual total visitor spending in 2018 was $601.3 million, supporting jobs in lodging, meals, attractions, groceries, retail shopping, local transportation, and recreation (PMVEIT, 2019).

Availability of economic information for Lee Vining is limited on the U.S. Census Bureau website. According to the Lee Vining Chamber of Commerce, the economy of the area is supported by lodging and restaurants, which are seasonally dependent (LVCOC, 2024). Lee Vining offers six lodges/resorts for overnight stays, five facilities for dining, an information center, and three sporting goods stores.

Table 6.15-2. Business Type for Mono County, Tuolumne County, and the State of California

Location	Total Non-Employer Establishments [a]	All Employer Firms [b]	Total Employer Establishments [c]
Mono County	1,252	514	662
Tuolumne County	3,977	1,174	1,248
State of California	3,426,315	742,139	998,582

Source: U.S. Census, 2017[18]

[a] Independent contractors
[b] Included are all nonfarm employer businesses filing the 941, 944, or 1120 tax forms.
[c] An establishment is a single physical location at which business is conducted or where services or industrial operations are performed.

[18] Most recently available data from the U.S. Census Bureau

6.15.2. Potential Adverse Effects and Issues

No potential effects have been identified from Stakeholders for socioeconomics, however, a brief discussion of potential effects relating to the No Action and Proposed Action are included below.

6.15.2.1. Effects of Project Operations and Maintenance on Socioeconomic Resources

No effects on socioeconomic resources in Lee Vining or the greater Mono County area have been identified.

No Action

Under the No Action, SCE will continue O&M of the Project in accordance with the terms and conditions of the existing FERC license. As such, no adverse effects on socioeconomics are expected from the No Action.

Proposed Action

No changes in Project operations are proposed as part of the Proposed Action; therefore, no adverse socioeconomic effects relating to continued operation of the Project are anticipated. Current Project operations provide employment for full-time and seasonal positions, as well as contract workers in the Project Vicinity.

The Project contributes to local socioeconomic resources through state and local taxes, which help support local public services, such as law enforcement, emergency services, health services, and schools.

Additionally, the domestic renewable energy produced by the Project has a positive effect on local residents by offering a more affordable energy source than fossil fuel-driven sources that may have to be extracted, imported, and transported to the region.

6.15.2.2. Consistency with Management Plan(s)

Currently, Mono County and Lee Vining do not have comprehensive plans filed with FERC. Mono County does have a General Plan (Mono County, 2009) in which growth is in conjunction with scenic, recreational, natural resource management. The plan includes measures to minimize land use conflicts and support tourism and agricultural economies (Mono County, 2009). The Project is consistent with the socioeconomic goals of the Mono County General Plan by contributing low-cost, carbon-neutral energy to the region, as well as some local employment opportunities.

6.15.2.3. Proposed Mitigation and Enhancement Measures

There are no existing or proposed PME measures for socioeconomic resources.

6.16. ENVIRONMENTAL JUSTICE

Consistent with EOs 12898[19] and 14008[20], SCE provides the following environmental justice (EJ) information for the Project. This overview is meant to provide an understanding of the number of EJ communities and non-English-speaking populations present within a 1-mile buffer of the Project Area and to identify the need for any targeted public engagement efforts related to relicensing the Project.

6.16.1. IDENTIFICATION OF ENVIRONMENTAL JUSTICE COMMUNITIES

USEPA's guidance (2016) regarding EJ assessments in the NEPA context has been used for the following analysis. The thresholds used for populations meeting EJ status are found in USEPA (2016) and described as follows:

- The "meaningfully greater analysis" and the "50 percent" methods were used to determine EJ status based on race:
  - To meet EJ criteria using the "meaningfully greater analysis," a block group qualifies as having EJ communities if the total minority population for a block group is at least 10 percent greater than that of the county population, as follows:
    - (County minority population) x (1.10) = threshold above which a block group minority population must be for inclusion as an EJ community.
  - To meet EJ criteria using the "50 percent" method, the total minority population must be greater than 50 percent to qualify as an EJ community.
- The "low-income threshold criteria" was used to identify EJ communities based on income level, where the block group must have a higher percentage of low-income households than the county.

6.16.2. AFFECTED ENVIRONMENT

The Project is located on Lee Vining Creek in Mono County, California. No new construction or operational changes are proposed as part of this relicensing; therefore, a 1-mile radius around the FERC Project Boundary has been analyzed for the presence of EJ communities, herein referred to as Project Vicinity. Within the Project Vicinity there are two census block groups that have the potential to be affected by Project operations for the term of a new license (Figure 6.16-1). One census block group, located in Tuolumne County, makes up 5.5 percent of the Project Vicinity while the other, located in Mono County, makes up 94.5 percent of the Project Vicinity. Both census block groups include minority populations, one of which meets criteria for EJ status: Census Tract 004201,

[19] EO 12898, 59 *Federal Register* 7629 (February 16, 1994), *Federal Actions to Address Environmental Justice in Minority and Low-Income Populations*.

[20] EO 14008, 86 *Federal Register* 7619-7633 (January 27, 2021), *Tackling the Climate Change Crisis at Home and Abroad*.

Block Group 3, with 97 percent of the population of that block group identifying as minority (Figure 6.16-1).

EJ communities also include groups of individuals with income levels below the poverty level, measured by household. There are no EJ communities meeting the poverty threshold within the Project Vicinity (Table 6.16-1; U.S. Census, 2022).

As a measure to ensure the public can be fully engaged in the relicensing process, non-English-speaking populations, regardless of their location within or outside of EJ block groups are also identified. There are no such populations (Table 6.16-1; U.S. Census, 2022) within the Project Vicinity.

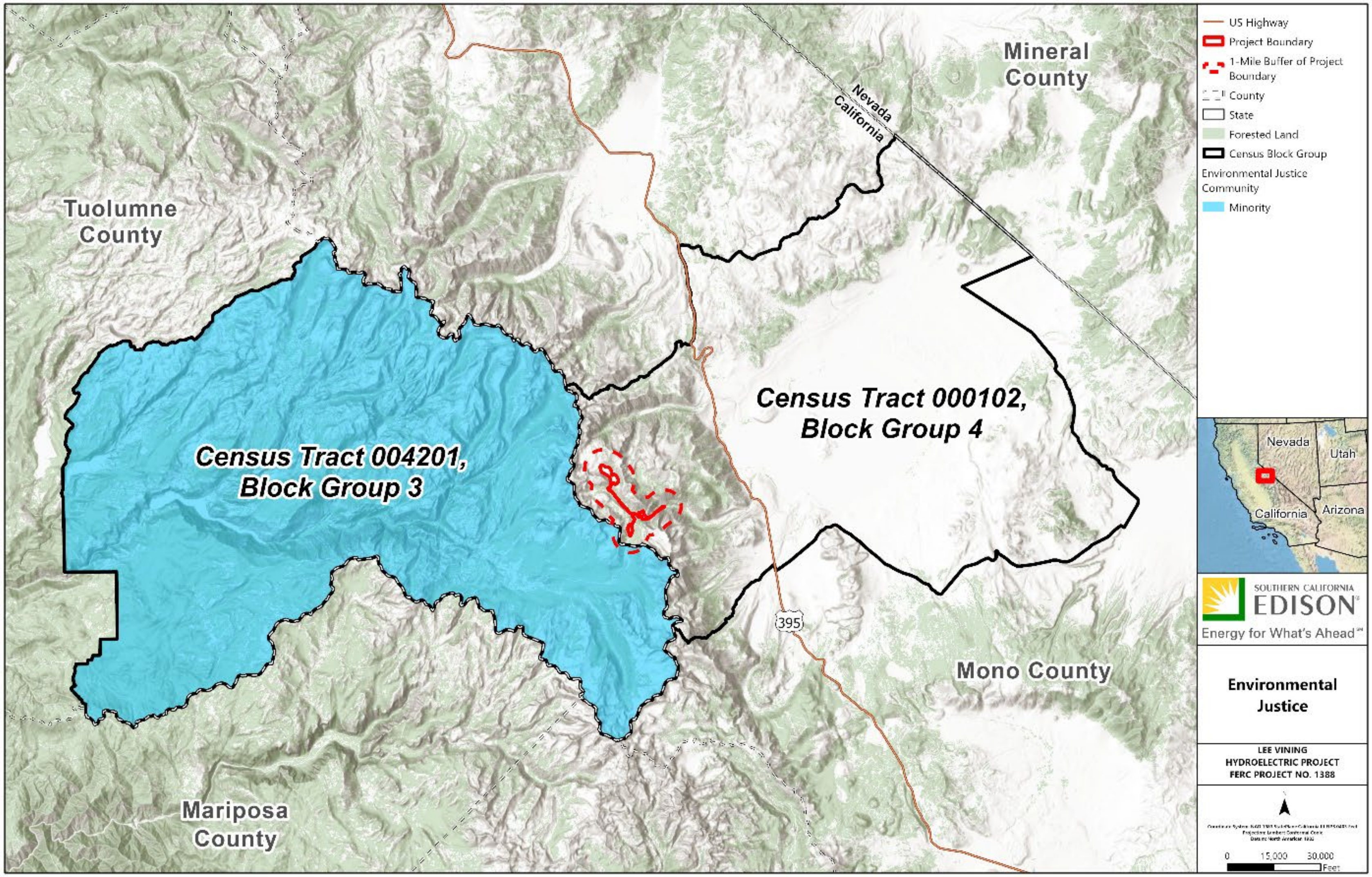


Figure 6.16-1. EJ Communities, Census Tracts, and Block Groups that Intersect with Project Vicinity.

Table 6.16-1. Census Data Within a 1-Mile Radius of the FERC Project Boundary

Race and Ethnicity Data											Low-Income Data	Language Data
Geographic Area	**Total Population (count)**	**White Alone, not Hispanic (count)**	**African American/Black (count)**	**Native American/Alaska Native (count)**	**Asian (count)**	**Native Hawaiian & Other Pacific Islander (count)**	**Some Other Race (count)**	**Two or More Races (count)**	**Hispanic or Latino (count)**	**Total Minority Population (%) [a]**	**Below Poverty Data (%)**	**Non-English Speaking Persons Aged 5 Years and Greater (%)**
California	39,356,104	13,848,294	2,102,510	114,271	5,861,649	135460	176,652	1,499,338	15,617,930	65%	12%	3%
Tuolumne County	54,993	43,547	806	556	799	151	300	1,755	7,079	21%	11%	0%
Census Tract 004201, Block Group 3	145	5	0	0	19	0	0	0	121	97%	0%	0%
Mono County	13,219	8,490	23	152	539	0	144	289	3,582	36%	9%	2%
Census Tract 000102, Block Group 4	817	536	0	0	0	0	0	0	281	34%	0%	0%

Source: U.S. Census, 2022
[a] Gray shaded cells indicate EJ community.

6.16.3. Existing Environmental Effects

The Project has been in place since 1922, providing safe and renewable power to the region. Resource areas that may affect EJ communities as a result of continued operation include shoreline erosion of private properties, water quality, recreation access, subsistence fishing, and operation-related air quality, noise, and traffic. There are no private properties associated with the reservoirs or the Project, so potential effects associated with private property shoreline erosion are not discussed further in this section; however, existing conditions of other resources are discussed below.

6.16.3.1. Water Quality

The three reservoirs associated with the Project are, from north to south, Saddlebag Lake, Ellery Lake, and Tioga Lake. Based on the findings of the Stream and Reservoir Water Quality (WQ-1) Study, the Project is consistent with the water quality objectives described in the 2019 LRWQCB Basin Plan (LRWQCB, 2019). For more water quality data, please see Section 6.4, *Water Resources*, or Volume III of the DLA.

6.16.3.2. Recreation Areas

The Recreation Use Assessment (REC-1) is still ongoing at the time of this DLA.

There are no Project recreation facilities or any related recreation management plan associated with the existing license or the Proposed Action. For more recreation data, please see Section 6.10, *Recreation*.

6.16.3.3. Subsistence Fishing, Hunting, or Plant Gathering

CDFW stocks all three Project reservoirs for recreational fishing, as well as the portion of Lee Vining Creek between Saddlebag and Ellery Lakes.

Individuals, including EJ populations, that are properly licensed to hunt and fish have access to USFS land within the FERC Project Boundary. Tribal communities are not required to have licenses to gather plants per the USFS plant gathering policy.

6.16.3.4. Construction or Operation-Related Air Quality, Noise, and Traffic

No new construction is proposed as part of the Proposed Action; therefore, there will be no effect on EJ populations from construction-related activities in the Project Vicinity.

Air quality is not affected by ongoing Project operations due to the zero-emissions nature of hydropower generation. Operation-related traffic and noise is limited to travel to and from the Project by operators, other staff, and recreationists.

6.16.4. Existing Cumulative Effects

Regional activities outside SCE's jurisdiction or control may result in disproportionate distribution of effects, resulting in cumulative effects[21] on EJ communities, such as industrial pollution, proximity to hazardous waste sites, traffic, and others. A 5-mile radius around the Project was analyzed for any such activities that may cumulatively affect EJ communities using the USEPA's screening tool: EJScreen. Within a 5-mile radius around the Project, the values of diesel particulate matter, air toxics related to cancer risk and respiratory hazard index, toxic air releases, traffic proximity, Risk Management Program (RMP)[22] facility proximity, hazardous waste proximity, underground storage tanks, and wastewater discharges are lower than the state average, resulting in less opportunity for there to be existing effects in the region contributing to any cumulative effects on EJ communities.

6.16.5. Public Engagement

As required by 18 CFR Part 16, the Licensee has conducted the necessary consultation for relicensing, including publishing publicly available notification of opportunities for engagement in the licensing process and appropriate public comment periods. Additionally, recreation surveys are being conducted in both English and Spanish. EJ communities continue to have an opportunity to provide comments during the required public comment periods.

Public outreach has included a postcard mailing to potentially interested parties in 2020, newspaper notifications in local papers (i.e., Mammoth Times and The Sheet) in 2021, an in-person site visit in 2021, an in-person meeting at the Lee Vining Community Center in 2024, and numerous virtual public meetings during the relicensing process. The SCE Lee Vining webpage includes information on how to stay informed and connected with the Project.

6.16.6. Potential Adverse Effects and Issues

6.16.6.1. Effects of Project Operations and Maintenance on Environmental Justice

<u>No Action</u>

Under the No Action, the Project would continue to operate under the terms and conditions of the current license. As no effects have been identified, no adverse effects on EJ communities are expected from the No Action.

[21] A cumulative effect is defined as an effect on the environment, which results from the incremental effect of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes such other actions (40 CFR § 1508.7).

[22] RMP facilities are facilities that use extremely hazardous substances and are required by the USEPA to develop a Risk Management Plan.

PROPOSED ACTION

No changes in Project operations are proposed as part of the Proposed Action. As evidenced by the USEPA-approved EJScreen analysis, the levels of air toxins and environmental stressors within the Project Area are below the state average; therefore, EJ communities present within the Project Vicinity are not exposed to higher-than-average ambient pollution at the baseline level. Resources where there is a potential nexus between Project operations and EJ communities including property erosion, water resources, subsistence resources, recreation, and ambient noise and air pollution will not contribute to disproportionately high or adverse effects on EJ communities because there are no established environmental stressors affecting EJ communities disproportionately under current operations. Analysis of existing operations, resource studies, and regional baseline conditions have not identified disproportionately high or adverse effects on EJ communities within the Project Vicinity.

6.16.6.2. Consistency with Management Plans

Section 10(a)(2)(A) of the FPA requires FERC to consider the extent to which a project is consistent with federal or state comprehensive plans for improving, developing, or conserving a waterway or waterways affected by the project.

Currently, Mono County and Lee Vining do not have comprehensive plans filed with FERC.

The Inyo National Forest LMP identifies outreach strategies for engaging with EJ communities (USFS, 2019). Outreach conducted for this relicensing is consistent with steps outlined in the LMP.

6.16.6.3. Proposed Mitigation and Enhancement Measures

As no effects have been identified, SCE is not proposing PME measures for EJ communities.

7.0 DEVELOPMENTAL ANALYSIS

This section addresses the electric power benefits of the Project; summarizes the cost, power value, and net benefit for each of the licensing decision alternatives; and provides the estimated cost for each of the environmental measures proposed or recommended for inclusion in a license. Consistent with the FERC approach to economic analysis, the power benefit of the Project is determined by estimating the cost of obtaining the same amount of energy and capacity using the likely alternative generating resources available in the region. 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-fueled generation, in which fuel cost is the largest component of the cost of electricity production.

This section includes an estimate of the net power benefit of the Project for each of the two licensing alternatives (No Action and Proposed Action) and an estimate of the cost of individual PME measures considered in the EA. To determine the net power benefit for each of the licensing alternatives, Project costs are compared to the value of the power output as represented by the cost of a likely alternative source of power in the region. For any alternative, a positive net annual power benefit indicates that the Project power costs less than the current cost of alternative generation resources, and a negative net annual benefit indicates that Project power costs more than the current cost of alternative generation resources. This estimate helps support an informed decision concerning what is in the public interest with respect to a proposed license.

7.1. POWER AND ECONOMIC BENEFITS

Table 7.1-1 summarizes the assumptions and the economic information used in the analysis. Numbers in this table will be updated for the FLA.

Table 7.1-1. Parameters for Economic Analysis of the Project

Parameter	Value
Taxes ($)	$249,326
Federal income tax rate (%)	*To be included in FLA*
State income tax rate (%)	8.84%
Levy rate for Mono County (%)	*To be included in FLA*
Insurance (SCE is self-insured)	N/A
Net investment (2023) ($) [a]	$14,584,424
Original cost (2023) ($)	$14,584,424
Future major operations capital cost ($) [b]	*To be included in FLA*

Parameter	Value
Relicensing implementation capital cost ($) [c]	*To be included in FLA*
Relicensing cost ($) [d]	*To be included in FLA*
Routine O&M ($/year) [e]	$1,178,146
New and non-routine O&M ($/year) [f]	*To be included in FLA*
Annual fees ($/year) [g]	*To be included in FLA*

FLA = Final License Application; N/A = data not available; O&M = operation and maintenance; PME = protection, mitigation, and enhancement; SCE = Southern California Edison

[a] Net investment, or net book value, is the depreciated Project investment allocated to power purposes. Reported as of the end of 2023.

[b] Future major capital costs included major plant rehabilitation to maintain present-day capability scheduled from 2027 through 2063 and are expressed in non-inflated dollars.

[c] Implementation capital costs include the cost of construction of new capital PME measures such as the proposed ongoing buffer and vegetation monitoring and new avian and orchid cooperative monitoring, bank stabilization, and recreation site upgrades.

[d] Relicensing costs include the administrative, legal/study, and other expenses to date or budgeted to complete the license process.

[e] Existing plant O&M does not include O&M related to PME measures associated with the current license.

[f] New and non-routine O&M includes PME measure operation, dam safety, and recreation and other PME measure maintenance.

[g] Annual fees paid under part I of the FPA are based on the nameplate capacity of the Project.

As currently operated, the Project generates an average of 26,600 MWh annually (since issuance of the current license from 1997 to 2027) and has an installed capacity of 11.25 MW.

7.2. COMPARISON OF ALTERNATIVES

Table 7.2-1 summarizes the annual cost, power benefits, and annual net benefits for the No Action and the Proposed Action. Project costs and benefits are presented in Exhibit D, *Project Cost and Financing*, and Exhibit H, *Description of Project Management and Need for Project Power*.

Table 7.2-1. Summary of the Annual Cost, Power Benefits, and Annual Net Benefits for the No Action and Proposed Action

	No Action	Proposed Action
Installed capacity (MW)	11.25	*To be included in FLA*
Average annual generation total (MWh) [a, b, c]	25,600	*To be included in FLA*
Average annual energy value ($/MWh)	$33.53	*To be included in FLA*
Average annual O&M cost ($) [a]	$1,178,146	*To be included in FLA*

	No Action	Proposed Action
Subtotal of nominal levelized cost (based on annual O&M costs) ($/MWh)	$46.02	*To be included in FLA*
Annual net benefit (value of Project power) ($)	$1,634,048	*To be included in FLA*

FLA = Final License Application; MW = megawatt; MWh = megawatt-hour; O&M = operation and maintenance
[a] Annual averages over the most recent 5-year period (2019 to 2023)
[b] Generation totals do not include spinning reserve. See Exhibit D, *Project Cost and Financing*, for more detail.
[c] Since issuance of the current license (1997 to 2023)

Under both the No Action and the Proposed Action, the Project would have an installed capacity of 11.25 MW and generate an average of 25,600 MWh of electricity annually, currently valued at approximately $33.53 per MWh. The direct annual O&M Project cost is currently valued at approximately $1,178,116 (2013 to 2023). An estimate of the average annual O&M cost will be included in the FLA for the Proposed Action. Similarly, an estimate of the annual levelized Project cost will be included in the FLA.

The FLA will include a levelized annual net benefit (or cost) statement. The Proposed Action would result in the environmental benefits that accompany implementation of the PME measures described in Appendix E.1, *Protection, Mitigation, and Enhancement Measures*. SCE would continue to operate the Project as a dependable source of renewable electrical energy for its customers.

Implementation of the Proposed Action would provide favorable customer benefits over the Project decommissioning. Project decommissioning was not considered and is dismissed from detailed analysis.

7.3. COST OF ENVIRONMENTAL MEASURES

This section is a placeholder that will be populated as part of the FLA, after environmental measures are finalized based on any additional Stakeholder input received on environmental measures presented in the DLA.

Table 7.3-1 provides the capital cost and O&M costs of each of the proposed PME measures considered in the analysis, with the PME costs also presented in Exhibit D, *Project Cost and Financing*.

Table 7.3-1. Cost of PME Measures Considered in Assessing the Environmental Effects of Continuing to Operate the Project

PME Measure ID	Measure Name	Capital Cost	O&M Cost
PME-1	MIF Requirements	$	*To be included in FLA*
PME-2	Reservoir Elevation Requirements	$	
PME-3	Fish Stocking at Ellery Lake	$	

PME Measure ID	Measure Name	Capital Cost	O&M Cost
PME-4	Resources Management Plan	$	
PME-5	Historic Properties Management Plan	$	

FLA = Final License Application; MIF = minimum instream flow; O&M = operation and maintenance; PME = protection, mitigation, and enhancement

7.4. AIR QUALITY

No substantial new construction is proposed for the Project, including any construction activities that would create air quality concerns. Air quality was not raised as an issue during consultation. As such, this section is not required as part of the analysis.

8.0 CONCLUSIONS AND RECOMMENDATIONS

This section compares the developmental and non-developmental effects of the No Action and the Proposed Action for the 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.

8.1. COMPARISON OF ALTERNATIVES

This section includes a comparison of the developmental and non-developmental effects (resource conditions) resulting from O&M of the Project under the No Action and the Proposed Action.

8.1.1. NO ACTION

The No Action maintains the existing baseline conditions with no additional benefits to resources (status quo). The Project would continue to operate under the current license conditions. No new environmental or cultural measures would be implemented.

8.1.2. PROPOSED ACTION

Overall, the Proposed Action (as described in Section 3.0, *No Action*, and Section 4.0, *Proposed Action*) is to continue to operate and maintain the Project. Key considerations in developing the Proposed Action were to ensure future O&M of the Project protects power generation, consumptive water supply, and system capability and reliability, while maintaining or enhancing environmental and cultural resources in the Project Vicinity. Potential resource effects under the Proposed Action are described in detail in Section 6.0, *Environmental Analysis*. Under the Proposed Action, ongoing Project O&M activities will be memorialized in environmental measures; management plans; and programs (collectively referred to as measures), which are designed to protect, maintain, or enhance environmental and cultural resources over the term of the new license (Appendix E.1, *Protection, Mitigation, and Enhancement Measures*). The proposed measures may include new resource protection measures (see Table 4.5-1 in Section 4.5, *New or Modified Environmental Measures, Management and Monitoring Plans, and Programs*) compared to the No Action.

The Project's annual average energy generation (2010 to 2023) under the No Action is between 7,873 MWh and 39,173 MWh; and it is estimated that the annual average energy generation under the Proposed Action will be between 7,873 MWh and 39,173 MWh.

It is anticipated that the Final PME measures to be included as part of the Proposed Action with the FLA will result in benefits to resources compared to the No Action. Examples of potential benefits associated with the Draft PME measures are described below:

- Geology and Soils (including Geomorphology)

  - Continued protection of geology and soil resources, including soil and erosion control measures described under the existing license.

- Water Resources
  - Maintains existing water uses and rights.
  - Maintains beneficial uses as defined by LRWQCB and the Basin Plan (LRWQCB, 2019).
- Fish and Aquatic Resources
  - Maintains instream flow conditions in support of resource management objectives.
- Botanical Resources and Wildlife Resources
  - Reduces the potential spread or introduction of non-native invasive plants.
  - Protects botanical populations of concern.
- Recreation
  - Supports existing recreational opportunities by maintaining minimum flows, minimum reservoir levels, and continuing stocking agreements with CDFW.
- Land Use and Management
  - Ensures that only land that is necessary for O&M of the Project is encompassed by the FERC Project Boundary.
  - Maintains consistency with established LMPs and policies, and land use designations.
  - Maintains consistency with the LMP for the Inyo National Forest (USFS, 2019).
  - Corrects mapping inconsistencies for better administrative management of forest resources.
- Aesthetic Resources
  - Continues to enhance visual quality by providing MIFs, which are associated with scenic quality.
- Cultural and Tribal Resources
  - Establishes clear protocols for protection and management of cultural and Tribal resources, including protection, identification, and NRHP evaluation.

- Establishes protocols for environmental review of Project O&M activities to ensure protection of cultural, Tribal, and historic properties.

8.2. UNAVOIDABLE ADVERSE IMPACTS

No unavoidable adverse effects to environmental resources have been identified as a result of implementation of the Proposed Action (refer to Section 6.0, *Environmental Analysis*).

8.2.1. RECOMMENDATIONS OF FISH AND WILDLIFE AGENCIES

The Proposed Action considers input from federal and state resource agencies, Native American Tribes, NGOs, and members of the public (collectively referred to as Project Stakeholders) acquired during consultation activities completed for relicensing of the Project. The proposed PME measures described in this License Application have been reviewed with agencies and other Stakeholders, and discussions are ongoing. To date, no formal recommendations from fish and wildlife agencies have been submitted; therefore, the Proposed Action presented herein represents only SCE's recommended PME measures. Should recommendations be made during the DLA comment period, SCE will update this section prior to filing the FLA.

8.3. CONSISTENCY WITH COMPREHENSIVE PLANS

FERC currently lists 110 comprehensive management plans for the state of California, of which 17 comprehensive plans pertain to resources in the Project Vicinity (FERC, 2023); no inconsistencies between these plans and the Proposed Action were identified (Table 8.3-1).

Section 10(a)(2)(A) of the FPA, 16 USC Section 803 (a)(2)(A), requires FERC to consider the extent to which a project is consistent with federal or state comprehensive plans for improving, developing, or conserving a waterway or waterways affected by the Project. On April 27, 1988, FERC issued Order No. 481-A, revising Order No. 481, issued October 26, 1987, establishing that FERC will accord FPA Section 10(a)(2)(A) comprehensive plan status to any federal or state plan that: (1) is a comprehensive study of one or more of the beneficial uses of a waterway or waterways; (2) specifies the standards, the data, and the methodology used; and (3) is filed with the Secretary of the Commission. No inconsistencies between these plans and the Proposed Action were found (Table 8.3-1).

Table 8.3-1. Relevant Comprehensive Management Plans

Agency	Comprehensive Plan	Year
SWRCB	Water Quality Control Plan on the Use and Disposal of Inland Waters Used for Power Plant Cooling	1975
USFWS	North American Waterfowl Management Plan	1986
NPS	The Nationwide Rivers Inventory. Department of the Interior, Washington, DC	1993
USFS	Wilderness Management Plan for the Ansel Adams, John Muir, and Dinkey Lakes Wildernesses and Inyo and Sierra National Forests	2001
CDFW	Strategic Plan for Trout Management: A Plan for 2004 and Beyond	2003
CDFW	California Wildlife: Conservation Challenges, California's Wildlife Action Plan	2007
CDFW, USFWS	Recovery Plan for the Sierra Nevada Bighorn Sheep	2007
CDFW	California Aquatic Invasive Species Management Plan	2008
CDFW	Final Hatchery and Stocking Program Environmental Impact Report/Environmental Impact Statement	2010
DPR	Outdoor Recreation in California's Regions 2013	2013
DPR	Survey on Public Opinions and Attitudes on Outdoor Recreation in California Complete Findings	2014
DPR	California Statewide Comprehensive Outdoor Recreation Plan (SCORP)	2015
SWRCB	Inland Surface Waters, Enclosed Bays, and Estuaries (ISWEBE) Plan: Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries of California. Sacramento, California	2015
USFS, CDFW, NPS, USFWS	Yosemite Toad Conservation Assessment	2015
Mono County	Mono County General Plan	2020
USFS	LMP for the Inyo National Forest	2023
USFWS	Fisheries USA: The Recreational Fisheries Policy of the U.S. Fish and Wildlife Service	n.d.

CDFW = California Department of Fish and Wildlife; COMM = commercial or sport fishing; CUL = Tribal Tradition and Culture; DPR = California Department of Parks and Recreation; LMP = Land Management Plan; n.d. = no date; NPS = National Park Service; NWI = National Wetlands Inventory; SWRCB = California State Water Resources Control Board; USFWS = U.S. Fish and Wildlife Service; USFS = U.S. Forest Service; WILD = wildlife habitat

8.4. FINDING OF NO SIGNIFICANT IMPACT

Continuing to operate and maintain the Project with the recommended environmental measures (including management and monitoring programs) included under the Proposed Action would not be a major federal action significantly affecting the quality of the environment. Implementation of the measures would result in greater resource protection as compared to the No Action. These measures are provided in Appendix E.1, *Protection, Mitigation, and Enhancement Measures*.

9.0 CONSULTATION DOCUMENTATION

Consultation that has occurred since the filing of the PAD in August 2021 is included in Volume II of this DLA. This consultation record contains a list of all federal, state, and interstate resource agencies, Native American Tribes, and members of the public with which SCE consulted with during development and implementation of the study plans and also in preparation of this DLA. Consultation that occurred through a formal Stakeholder engagement process such as site visits, scoping meetings, and Study Report meetings are also documented in the FERC Docket. Final Technical Reports are included in Volume III of this DLA. Draft Technical Reports were previously distributed to Stakeholders for a 60-day review period. Comments and responses gathered as part of the review processes are detailed in the consultation table at the beginning of Volume III; any meetings held for the discussion of those comments are included in the larger consultation record. The Recreation Use Assessment (REC-1) Study is ongoing through October 2024 due to weather-related delays in 2023. The Draft Technical Report will be included with the FLA; the final version of the REC-1 Draft Technical Report will be filed with FERC following Stakeholder review and filing of the FLA. The Tribal Resource (TRI-1) Study is also ongoing, and the Draft Technical Report will be filed as confidential and privileged with the FLA. Draft Technical Reports for cultural resources (archaeology and built environment) are filed as confidential and privileged with this DLA (Volume V).

The complete log of all consultation, including comments provided on this Exhibit E, will be provided with the FLA. Select consultation documents deemed significant are provided in the *Consultation Log*, which is provided in Volume II of this DLA, while others (i.e., emails, memorandums) are available upon request.

10.0 REFERENCES

<u>SECTION 1.0</u>

Berkeley Law. 2024. "California Climate Policy Dashboard." Accessed: February 12, 2024. Retrieved from: https://www.law.berkeley.edu/research/clee/research/climate/climate-policy-dashboard/.

CARB (California Air Resources Board). 2023. "Advanced Clean Equipment - Financial and Regulatory Programs." Accessed: December 15, 2023. Retrieved from: https://ww2.arb.ca.gov/our-work/programs/msei/ace-financial-regulatory-programs.

CEC (California Energy Commission). 2023. "Clean Energy and Pollution Reduction Act - SB 350." Accessed: August 1, 2024. Retrieved from: https://www.energy.ca.gov/rules-and-regulations/energy-suppliers-reporting/clean-energy-and-pollution-reduction-act-sb-350.

NERC (North American Electric Reliability Corporation). 2024. Homepage. Accessed: August 1, 2024. Retrieved from: https://www.nerc.com/Pages/default.aspx.

SCE (Southern California Edison). 2019. Pathway 2045 White Paper. Accessed: August 1, 2024. Retrieved from: https://www.edison.com/clean-energy/pathway-2045.

Petek, Gabriel. 2020. *Assessing California's Climate Policies—Electricity Generation.* Legislative Analyst's Office. Accessed: August 1, 2024. Retrieved from: https://lao.ca.gov/reports/2020/4131/climate-policies-electricity-010320.pdf.

WECC (Western Electricity Coordinating Council). 2023. *2023 Western Assessment of Resource Adequacy*. Accessed: August 2, 2024. Retrieved from: https://www.wecc.org/wecc-document/5411.

<u>SECTION 2.0</u>

NOAA (National Oceanic and Atmospheric Administration Fisheries). 2023. Essential Fish Habitat Mapper [online database]. Accessed: December 15, 2023. Retrieved from: https://www.habitat.noaa.gov/apps/efhmapper/?page=page_4.

USFS (U.S. Forest Service). 2019. *Land Management Plan for the Inyo National Forest. Fresno, Inyo, Madera, Mono and Tulare Counties, California; Esmeralda and Mineral Counties, Nevada*. R5-MB-323a. Pacific Southwest Region. September. Accessed: August 24, 2020. Retrieved from: https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd664404.pdf.

USFS (U.S. Forest Service). 2023. Inyo National Forest: Wilderness Areas. Accessed: December 15, 2023. Retrieved from: https://www.fs.usda.gov/recarea/inyo/recreation/recarea/?recid=26204.

SECTION 3.0

FERC (Federal Energy Regulatory Commission). 1997. *Order Issuing New License*. Project No. 1388-001. February 4.

SCE (Southern California Edison). 1997a. *Plan for Control of Erosion, Stream Sedimentation, Soil Mass Movement, and Dust*. FERC Project No. 1388-CA. September 1997.

SCE (Southern California Edison). 1997b. *Plan for Storage and/or Disposal of Excess Construction/Tunnel Spoils and Slide Materials*. FERC Project No. 1388-CA. September 1997.

SCE (Southern California Edison). 1997c. *Plan for Oil and Hazardous Waste Storage and Spill Prevention and Cleanup*. FERC Project No. 1388-CA. September 1997.

SCE (Southern California Edison). 1997d. *Threatened, Endangered, and Sensitive Species Management Plan*. FERC Project No. 1388-CA. Revised September 24, 1997.

SCE (Southern California Edison). 1997e. *Plan for the Design and Construction of Project Facilities in Order to Preserve or Enhance Visual Quality*. FERC Project No. 1388-CA. September 1997.

SCE (Southern California Edison). 2018. *Supporting Technical Information Document, Tioga Lake Dams*. FERC Project No. 1388-CA. May 2018.

SCE (Southern California Edison). 2020a. Supporting Technical Information Document, Rhinedollar Dam. FERC Project No. 1388-CA. November 2020.

SCE (Southern California Edison). 2020b. Supporting Technical Information Document, Saddlebag Lake Dam. FERC Project No. 1388-CA. November 2020.

SCE (Southern California Edison). 2023. Supporting Technical Information Document, Tioga Lake Dams. FERC Project No. 1388-CA. June 2023.

SWRCB (State Water Resources Control Board). 2024. Electronic Water Rights Information Management System (eWRIMS). Accessed: August 2024. Retrieved from: https://www.waterboards.ca.gov/waterrights/water_issues/programs/ewrims/.

USGS (U.S. Geological Survey). 2020. Water-Year Summary for Site USGS 10287760. Accessed: July 2020. Retrieved from: https://nwis.waterdata.usgs.gov/nwis/wys_rpt?dv_ts_ids=&&adr_begin_date=2018-10-01&adr_end_date=2019-09-30&site_no=10287760&agency_cd=USGS.

White, D.R.M. 1990. Management Plan for Historic and Archaeological Resources Associated with the Lee Vining Creek Hydroelectric Project (FERC Project No. 1388), Mono County, California. April 1990.

SECTION 4.0

None.

SECTION 5.0

None.

SECTION 6.1

None.

SECTION 6.2

CDEC (California Data Exchange Center). 2023. “Ellery Lake (ERY) and Dana Meadows (DAN) Precipitation and Temperature Data.” California Department of Water Resources. Accessed: July 2024. Retrieved from: https://cdec.water.ca.gov/dynamicapp/wsSensorData.

FERC (Federal Energy Regulatory Commission). 1992. *Final Environmental Assessment for Hydropower License*. Lee Vining FERC Project No. 1388-001. California. Washington, D.C.: Federal Energy Regulatory Commission, Office of Hydropower Licensing. December 30.

LADWP (Los Angeles Department of Water and Power). 1987. *Mono Basin Geology and Hydrology*. Los Angeles Department of Water and Power Aqueduct Division, Hydrology Section. March.

Millar, C.I., and W.B. Woolfenden. 1999. “The Role of Climate Change in Interpreting Historical Variability.” *Ecological Applications* 9(4):1207–1216. Accessed: July 2024. Retrieved from: https://www.fs.usda.gov/psw/publications/millar/captured/psw_1999_millar008.pdf.

MRLC Consortium (Multi-Resolution Land Characteristic Consortium). 2021. “Multi-Resolution Land Characteristics Consortium” [online database]. Accessed: July 2024. Retrieved from: https://www.mrlc.gov.

SCE (Southern California Edison). 2020. *Supporting Technical Information Document, Rhinedollar Dam*. FERC Project No. 1388-CA. November 2020.

SCE (Southern California Edison). 2023. *Supporting Technical Information Document, Tioga Lake Dams*. FERC Project No. 1388-CA. June 2023.

U.S. Climate Data. 2023. "Climate Lee Vining – California" [online database]. Accessed: December 2023. Retrieved from: https://www.usclimatedata.com/climate/lee-vining/california/united-states/usca0601.

USFS (U.S. Forest Service). 2019. *Land Management Plan for the Inyo National Forest. Fresno, Inyo, Madera, Mono and Tulare Counties, California; Esmeralda and Mineral Counties, Nevada*. R5-MB-323a. Pacific Southwest Region. September. Accessed: December 2023. Retrieved from: https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd664404.pdf.

Vorster, P. 1985. "A Water Balance Forecast Model for Mono Lake, California." Thesis, Presented to the Faculty of California State University, Hayward. Mono Lake Committee, Mono Basin Clearinghouse. Accessed: August 2024. Retrieved from: https://www.monobasinresearch.org/onlinereports/waterbalance.php.

SECTION 6.3

Barth, A.P., J.D. Walker, J.L. Wooden, N.R. Riggs, and R.A. Schweickert. 2011. "Birth of the Sierra Nevada magmatic arc: Early Mesozoic plutonism and volcanism in the east-central Sierra Nevada of California." *Geosphere* 7(4):877–897. Accessed: August 2020. Retrieved from: https://doi.org/10.1130/GES00661.1.

Bateman, P.C. 1965. *Geology and Tungsten Mineralization of the Bishop District California*. Geological Survey Professional Paper 470. Prepared in cooperation with the State of California, Department of Conservation, Division of Mines and Geology. Washington, D.C. Accessed: June 2021. Retrieved from: https://pubs.usgs.gov/pp/0470/report.pdf.

Bateman, P.C. 1992. *Plutonism in the central part of the Sierra Nevada batholith, California*. U.S. Geological Survey. Professional Paper 1483. Washington, D.C. Accessed: June 2021. Retrieved from: https://doi.org/10.3133/pp1483.

Bursik, M. 1991. "Relative Dating of Moraines Based on Landform Degradation, Lee Vining Canyon, California." *Quaternary Research* 35(3):451–455. Accessed: May 30, 2024. Retrieved from: https://doi.org/10.1016/0033-5894(91)90057-C.

CASC Engineering and Consulting. 2020. "Lee Vining Open House Info" YouTube video, 9:38. Posted by Southern California Edison, January 13, 2021. Accessed: May 30, 2024. Retrieved from: https://www.youtube.com/watch?v=EGVsfSKT-YI.

CGS (California Geological Survey). 2015. CGS Information Warehouse: Mineral Land Classification. Accessed: July 20, 2020. Retrieved from: https://maps.conservation.ca.gov/cgs/informationwarehouse/mlc/.

FERC (Federal Energy Regulatory Commission). 1992. *Final Environmental Assessment for Hydropower License*. Lee Vining FERC Project No. 1388-001. California. Washington, D.C.: Federal Energy Regulatory Commission, Office of Hydropower Licensing. December 30.

FERC (Federal Energy Regulatory Commission). 1997. *Order Issuing New License*. Project No. 1388-001. February 4.

Gillespie, Alan R., and Douglas H. Clark. 2011. "Chapter 34 - Glaciations of the Sierra Nevada, California, USA." In *Quaternary Glaciations - Extent and Chronology: A Closer Look*, edited by J. Ehlers, P.L. Gibbard, and P.D. Hughes. *Developments in Quaternary Sciences* 15:447–462. Amsterdam: Elsevier Science. Accessed: August 2020. Retrieved from: https://www.sciencedirect.com/science/article/abs/pii/B9780444534477000349.

Gillespie, Alan R., and Paul H. Zehfuss. 2004. "Glaciations of the Sierra Nevada, California, USA*."* In *Quaternary Glaciations - Extent and Chronology, Part II: North America*, edited by J. Ehlers, and P.L. Gibbard. *Developments in Quaternary Sciences* 2 (Part B): 51–62. Amsterdam: Elsevier Science. Accessed: August 2020. Retrieved from: https://www.sciencedirect.com/science/article/abs/pii/S1571086604801854.

Huber, N. King, Paul C. Bateman, and Clyde Wahrhaftig. 1989. Geologic Map of Yosemite National Park and Vicinity, California. Department of the Interior, U.S. Geological Survey Map I-1874 scale 1:125,000, Washington, D.C. Accessed: August 2020. Retrieved from: https://pubs.usgs.gov/imap/i1874/.

Jones & Stokes Associates. 1993. *Environmental Impact Report for the Review of Mono Basin Water Rights of the City of Los Angeles*. Draft. JSA 90-171. Prepared for California State Water Resources Control Board, Division of Water Rights [Lead Agency], Sacramento, California.

LADWP (Los Angeles Department of Water and Power). 1987. *Mono Basin Geology and Hydrology.* Los Angeles Department of Water and Power Aqueduct Division, Hydrology Section. March.

LADWP (Los Angeles Department of Water and Power). 2021. *Final CEQA Initial Study and Mitigated Negative Declaration*. Mono Basin Water Rights Licenses Project.

Lahren, M.M. 1989. "Tectonic studies of the Sierra Nevada: Structure and stratigraphy of miogeoclinal rocks in Snow Lake pendant, Yosemite-Emigrant wilderness; and TIMS analysis of the Northern Sierra terrane." Doctoral dissertation. University of Nevada, Reno.

Le, K., J. Lee, L.A. Owen, and R. Finkel. 2007. “Late Quaternary slip rates along the Sierra Nevada frontal fault zone, California: Slip partitioning across the western margin of the Eastern California Shear Zone–Basin and Range Province.” *GSA Bulletin* 119(1-2):240–256. Accessed: August 2020. Retrieved from: https://doi.org/10.1130/B25960.1.

Millar, C.I., and W.B. Woolfenden. 1999. “The Role of Climate Change in Interpreting Historical Variability.” *Ecological Applications* 9(4):1207–1216. Accessed: August 2020. Retrieved from: https://www.fs.usda.gov/psw/publications/millar/captured/psw_1999_millar008.pdf.

Phillips, F. 2017. “Glacial chronology of the Sierra Nevada, California, from the Last Glacial Maximum to the Holocene.” *Geographical Research Letters* 43(2):527–552. Accessed: June 2021. Retrieved from: https://doi.org/10.18172/cig.3233.

R2 (R2 Resource Consultants). 2002. *Sediment Bypass Alternatives for Lee Vining Creek. Prepared for Los Angeles Department of Water and Power*. Prepared by R2 Resource Consultants, Redmond, Washington, with support of Montgomery Watson Harza, Bellevue, Washington. March 29.

Read, E. 2022. *Draft Lee Vining Creek (FERC No. 1388) Riparian Monitoring Phase 2, Year 4 (2021) Compared to Previous Years*. Prepared for Southern California Edison Company. Orange, California.

SCE (Southern California Edison). 1997. *Plan for Control of Erosion, Stream Sedimentation, Soil Mass Movement, and Dust*. Lee Vining Hydroelectric Project. FERC No. 1388-016. September.

Schweickert, R.A., and M.M. Lahren. 1987. “Continuation of Antler and Sonoma orogenic belts to the eastern Sierra Nevada, California, and Late Triassic thrusting in a compressional arc.” *Geology* 15(3):270–273. Accessed: August 2020. Retrieved from: https://doi.org/10.1130/0091-7613(1987)15<270:COAASO>2.0.CO;2.

USDA (U.S. Department of Agriculture). 2020. Web Soil Survey [online database]. Accessed: June 10, 2020. Retrieved from: http://websoilsurvey.sc.egov.usda.gov/.

USFS (U.S. Forest Service). 2019. *Land Management Plan for the Inyo National Forest: Fresno, Inyo, Madera, Mono, and Tulare Counties, California; Esmeralda and Mineral Counties, Nevada*. R5-MB-323a. Pacific Southwest Region. September. Accessed: August 2024. Retrieved from: https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd664404.pdf.

USGS (U.S. Geological Survey). 2018. Mineral Resources Online Spatial Data. Mineral Resources Data System: U.S. Geological Survey database. Accessed: July 29, 2020. Retrieved from: https://mrdata.usgs.gov/.

Vaughn, D.E. 1983. *Soil Inventory of the Benton-Owens Valley Area, Inyo and Mono Counties, California.* Draft. U.S. Department of the Interior, Bureau of Land Management.

Vorster, P. 1985. "A Water Balance Forecast Model for Mono Lake, California." Thesis, Presented to the Faculty of California State University, Hayward. Mono Lake Committee, Mono Basin Clearinghouse. Accessed: August 2024. Retrieved from: https://www.monobasinresearch.org/onlinereports/waterbalance.php.

Wieczorek, G.F., and S. Jäger. 1996. "Triggering mechanisms and depositional rates of postglacial slope-movement processes in the Yosemite Valley, California." *Geomorphology* 15:17–31. Accessed: August 2020. Retrieved from: https://doi.org/10.1016/0169-555X(95)00112-I.

SECTION 6.4

CEDEN (California Environmental Data Exchange Network). 2024. Database. State Water Resources Control Board, Sacramento, California. Accessed: July 2024. Retrieved from: http://ceden.org/index.shtml.

Cohen, A.P. 2019. "Comparative limnology of high-elevation lakes and reservoirs and their downstream effects." University of California, Santa Barbara, doctoral dissertation. ProQuest ID: Cohen_ucsb_0035D_14552. Accessed: July 2024. Retrieved from: https://escholarship.org/uc/item/3466p1n8.

Diamond, V.H., and R.A. Hicks. 1988. *Historic Overview of the Rush Creek and Lee Vining Creek Hydroelectric Projects*. Project Managers: Dorothea Theodoratus and Clinton M. Blount. Submitted to Southern California Edison Company, Rosemead, California, by Theodoratus Cultural Research, Inc., Fair Oaks, California. August.

FERC (Federal Energy Regulatory Commission). 1992. *Final Environmental Assessment for Hydropower License. Lee Vining FERC Project No. 1388-001*. California. Washington, D.C.: Federal Energy Regulatory Commission, Office of Hydropower Licensing. December 30.

Elliott, J.M. 1981. "Some aspects of thermal stress on freshwater teleosts." Pages 209–245 in A.D. Pickering (ed.), *Stress and Fish*. London: Academic Press.

Frost, W.E., and M.E. Brown. 1967. *The Trout*. New Naturalist Series, Collins, St. James Place. London.

Horne, A.J., and C.R. Goldman. 1994. *Limnology*. Second edition. USA: McGraw-Hill, Inc.

LADWP (Los Angeles Department of Water and Power). 1987. *Mono Basin Geology and Hydrology*. Los Angeles Department of Water and Power Aqueduct Division—Hydrology Section. March.

Jones & Stokes Associates. 1993. *Environmental Impact Report for the Review of Mono Basin Water Rights of the City of Los Angeles*. Draft. JSA 90-171. Prepared for California State Water Resources Control Board, Division of Water Rights [Lead Agency], Sacramento, California.

Lloyd, A.C., and J.E. Denton. 2005. *General Protocol for Sport Fish Sampling and Analysis*. State of California Pesticide and Environmental Toxicology Branch Office of Environmental Health Hazard Assessment California Environmental Protection Agency. December.

LRWQCB (Lahontan Region Water Quality Control Board). 2019. *Water Quality Control Plan for the Lahontan Region* (as amended). First published in 1995, revised 2019. Accessed: July 2024. Retrieved from: https://www.waterboards.ca.gov/lahontan/water_issues/programs/basin_plan/references.html.

Lund, L.J. 1988. *Water Quality of Bishop Creek and Selected Eastern Sierra Nevada Lakes*. Report of Research for 1986–1988. Submitted to Southern California Edison. Riverside: University of California.

OEHHA (Office of Environmental Health Hazard Assessment). 2008. *Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, dieldrin, methylmercury, PCBs, selenium, and toxaphene*. Office of Environmental Health Hazard Assessment, California Environmental Protection Agency, Sacramento, California. Accessed: July 2024. Retrieved from: http://oehha.ca.gov/media/downloads/fish/report/atlmhgandothers2008c.pdf.

OEHHA (Office of Environmental Health Hazard Assessment). 2021. *Statewide Health Advisory and Guidelines for Eating Fish from California's Lakes and Reservoirs without Site-Specific Advice.* Office of Environmental Health Hazard Assessment, California Environmental Protection Agency, Sacramento, California. Accessed: July 2024. Retrieved from: https://oehha.ca.gov/media/downloads/advisories/fishadvisorystatewidelakesreport2021.pdf.

Rost, A., and C. Fritsen. 2014. "Influence of a tributary stream on benthic communities in a *Didymosphenia geminata* impacted stream in the Sierra Nevada, USA." *Diatom Research* 29(3):249–257. Accessed: July 2024. Retrieved from: https://www.tandfonline.com/doi/full/10.1080/0269249X.2014.929029.

Sadro, S., C.E. Nelson, and J.M. Melack. 2012. "The Influence of Landscape Position and Catchment Characteristics on Aquatic Biogeochemistry in High-Elevation Lake-Chains." *Ecosystems* 15(3):363–386. Accessed: July 2024. Retrieved from: https://link.springer.com/article/10.1007/s10021-011-9515-x#citeas.

Salamunovich, T. 2017. *Fall 2016 Fish Population Survey, Upper Lee Vining Creek, Mono County, California*. Draft Report. Prepared for E Read & Associates Inc. by Normandeau Associates, Arcata, California. February 13.

SCE (Southern California Edison). 1997a. *Plan for Control of Erosion, Stream Sedimentation, Soil Mass Movement, and Dust.* FERC Project No. 1388-CA. September 1997.

SCE (Southern California Edison). 1997b. *Plan for Storage and/or Disposal of Excess Construction/Tunnel Spoils and Slide Materials*. FERC Project No. 1388-CA. September 1997.

SCE (Southern California Edison). 1997c. *Plan for Oil and Hazardous Waste Storage and Spill Prevention and Cleanup*. FERC Project No. 1388-CA. September 1997.

SCE (Southern California Edison). 2021. *Lee Vining Hydroelectric Project (FERC Project No. 1388) Preliminary Application Document*. August.

SWRCB (State of California Water Resources Control Board). 1989. *Analysis of Water Rights Held by Southern California Edison for the Rush and Lee Vining Creek Projects*. Memorandum, Files – 262.0(10-09).

SWRCB (State of California Water Resources Control Board). 1994. *Decision 1631: Decision and Order Amending Water Right Licenses to Establish Fishery Protection Flows in Streams Tributary to Mono Lake and to Protect Public Trust Resources at Mono Lake and in the Mono Lake Basin*. Mono Basin Clearinghouse. Accessed: July 2024. Retrieved from: https://www.waterboards.ca.gov/waterrights/board_decisions/adopted_orders/decisions/d1600_d1649/wrd1631.pdf.

SWRCB (State of California Water Resources Control Board). 2013. *Settlement Agreement Regarding Continuing Implementation of Water Rights Orders 98-05 and 98-07*. In the matter of: City of Los Angeles Department of Water and Power, Water Right Licenses Nos. 10191 and 10192. Accessed: July 2024. Retrieved from: https://www.waterboards.ca.gov/waterrights/water_issues/programs/mono_lake/docs/mb_sttlmntagrmnt_signed.pdf.

SWRCB (State of California Water Resources Control Board). 2017. *Final Part 2 of the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries of California – Trabal and Subsistence Fishing Beneficial Uses and Mercury Provisions.* Accessed: July 2024. Retrieved from: https://www.waterboards.ca.gov/water_issues/programs/mercury/docs/hg_prov_final.pdf.

SWRCB (State of California Water Resources Control Board). 2018. eWRIMS GIS System. Accessed: July 2024. Retrieved from: https://waterrightsmaps.waterboards.ca.gov/viewer/index.html?viewer=eWRIMS.eWRIMS_gvh#.

SWRCB (State of California Water Resources Control Board). 2021. ORDER WR 2021-0086 EXEC: Order Approving Petitions for Change and Issuing Amended Licenses. In the Matter of Licenses 10191 and 10192 (Applications 8042 and 8043) held by the City of Los Angeles, Department of Water and Power.

USEPA (U.S. Environmental Protection Agency). 2013. *Aquatic Life Ambient Water Quality Criteria for Ammonia—Freshwater 2013*. April. Accessed: July 2024. Retrieved from: https://www.epa.gov/sites/default/files/2015-08/documents/aquatic-life-ambient-water-quality-criteria-for-ammonia-freshwater-2013.pdf.

USEPA (U.S. Environmental Protection Agency). 2020. WATERS application accessed using Google Earth KMZ online. Accessed: July 20, 2020. Retrieved from: https://www.epa.gov/waterdata/waters-geoviewer.

USFS (U.S. Forest Service). 2019. *Land Management Plan for the Inyo National Forest: Fresno, Inyo, Madera, Mono, and Tulare Counties, California; Esmeralda and Mineral Counties, Nevada.* R5-MB-323a. Pacific Southwest Region. September. Accessed: July 2024. Retrieved from: https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd664404.pdf.

SECTION 6.5

Beak (Beak Consultants Incorporated). 1991. I*nstream flow requirements for brown trout, Rush Creek, Mono County*. California Department of Fish and Game Stream Evaluation Report 91-1. Sacramento, California.

Bell, M.C. 1991. *Fisheries Handbook of Engineering Requirements and Biological Criteria. Fish Passage Development and Evaluation Program*. U.S. Army Corps of Engineers, North Pacific Division. Portland, Oregon.

Bjornn, T.C., and D.W. Reiser. 1991. “Habitat Requirements of Salmonids in Streams.” In *Influences of Forest and Rangeland Management*. Edited by W.R. Meehan. American Fisheries Society Special Publication 19. Bethesda, MD.

Calkins, D.J. 1989. *Winter habitats of Atlantic salmon, brook trout, brown trout and rainbow trout: A literature review.* U.S. Army Corps of Engineers. Special Report 89-34. October.

CEDEN (California Environmental Data Exchange Network). 2020. Database. State Water Resources Control Board, Sacramento, California. Accessed: July 2020. Retrieved from: http://ceden.org/index.shtml.

Cohen, A.P. 2019. "Comparative limnology of high-elevation lakes and reservoirs and their downstream effects." University of California, Santa Barbara, doctoral dissertation. ProQuest ID: Cohen_ucsb_0035D_14552. Accessed: July 2024. Retrieved from: https://escholarship.org/uc/item/3466p1n8.

EA (EA Engineering, Science, & Technology, Inc). 1986. *Instream Flow and Fisheries Studies for the Upper Lee Vining Creek Hydroelectric Project.* Prepared for Southern California Edison Company. June 1986.

EA (EA Engineering, Science, & Technology, Inc). 1987b. *East Side Sierra Hydroelectric Relicensing Studies: Impacts of Reservoir Drawdown on Fish Populations.* Prepared for Southern California Edison Company. March 1987.

Ebasco Environmental. 1993. *North Fork Stanislaus River Basin 1992 fish population surveys*. Prepared for Northern California Power Agency. Sacramento, California.

FERC (Federal Energy Regulatory Commission). 1992. *Final Environmental Assessment for Hydropower License.* Lee Vining FERC Project No. 1388-001. California. Washington, D.C.: Federal Energy Regulatory Commission, Office of Hydropower Licensing. December 30.

Groves Energy Company. 1984. Supplemental information, Keating Leggett Project No. 3272-002-California. Sacramento, California, January 31, 1984.

Herbst, D.B., and R.B. Medhurst. 2010. *Report on South Lake and Saddlebag Lake Invertebrate Inventories.* October 20, 2010.

LRWQCB (Lahontan Region Water Quality Control Board). 2019. *Water Quality Control Plan for the Lahontan Region* (as amended). First published in 1995, revised 2019. Accessed: August 2023. Retrieved from: https://www.waterboards.ca.gov/lahontan/water_issues/programs/basin_plan/references.html.

Moyle, P.B. 2002. *Inland Fishes of California*. Berkeley: University of California Press.

NOAA (National Oceanic and Atmospheric Administration). 2024. California Nevada River Forecast Center [online database]. Accessed: July 2024. Retrieved from: www.cnrfc.noaa.gov.

Rehn, A.C., R.D. Mazor, and P.R. Ode. 2015. *The California Stream Condition Index (CSCI): A New Statewide Biological Scoring Tool for Assessing the Health of Freshwater Streams.* SWAMP Technical Memorandum, SWAMP-TM-2015-0002. California Department of Fish and Wildlife, Southern California Coastal Water Research Project.

Rehn, A.C., N. Ellenrieder, and P.R. Ode. 2007. *Assessment of ecological impacts of hydropower projects on benthic macroinvertebrate assemblages: A review of existing data collected for FERC relicensing studies.* California Energy Commission, PIER-Energy Related Environmental Research Program. CEC-500-2007-040.

Rost, A., and C. Fritsen. 2014. "Influence of a tributary stream on benthic communities in a Didymosphenia geminata impacted stream in the Sierra Nevada, USA." *Diatom Research* 29(3):249–257. DOI:10.1080/0269249X.2014.929029.

Sada, D.W. 2007. *Fish Population Surveys in Lee Vining Creek, Mono County, California, 1999–2006*. Submitted to Southern California Edison Company, Rosemead, California. June 8.

Sada, D.W., and C. Hogle. 2011. *Lee Vining Creek, Mono County, California Fish Population Survey, October 2011*. December 15.

Salamunovich, T. 2017a. *Fall 2016 Fish Population Survey, Upper Lee Vining Creek, Mono County, California.* Draft Report. Prepared for E Read & Associates Inc. by Normandeau Associates, Arcata, California. February 13.

Salamunovich, T. 2017b. *Fall 2016 Aquatic Habitat Survey, Upper Lee Vining Creek, Mono County, California.* Draft Report. Prepared for E Read & Associates Inc. by Normandeau Associates, Arcata, California. February 13.

Salamunovich, T. 2021. *Fall 2021 Fish Population Survey, Upper Lee Vining Creek, Mono County, California*. December 3, 2021, draft report prepared by TRPA Fish Biologists for Psomas, Santa Ana, California.

SCE (Southern California Edison). 2007. *Amended Preliminary Draft Environmental Assessment (APDEA)*. FERC Project Nos. 2085, 2175, 67, and 120. Attachment H. February.

SCE (Southern California Edison). 2017. *Invasive Mussel Prevention Plan*. FERC Project No. 1388-CA. July 2017.

SWRCB (State Water Resources Control Board). 2020. Bioassessment Scores Map Network operated by the State Water Resources Control Board: an interactive compilation of data collected from 1999 through 2015 as part of the Perennial Streams Assessment, Reference Condition Management Program, Southern Stormwater Monitoring Coalition, U.S. Forest Service, and Regional Board Bioassessment Monitoring Programs. Accessed: July 2020. Retrieved from: https://www.waterboards.ca.gov/water_issues/programs/swamp/bioassessment/csci_scores_map.html.

USFS (U.S. Forest Service). 2019. *Land Management Plan for the Inyo National Forest. Fresno, Inyo, Madera, Mono and Tulare Counties, California; Esmeralda and Mineral Counties, Nevada. R5-MB-323a.* Pacific Southwest Region. September. Accessed: August 24, 2020. Retrieved from: https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd664404.pdf.

Watz, J., E. Bergman, O. Calles, A. Enefalk, S. Gustafsson, A. Hagelin, P.A. Nilsson, J.R. Norrgard, D. Nyqvist, E.M. Osterling, J.J. Piccolo, L.D. Schneider, L. Greenberg, and B. Jonsson. 2015. “Ice cover alters the behavior and stress level of brown trout Salmo trutta.” *Behavioral Ecology* 26(3):820–827.

Whitton, B.A., N.T.W. Ellwood, and B. Kawecka. 2009. “Biology of the freshwater diatom Didymosphenia: a review.” *Hydrobiologia* 630:1–37.

Wilcox, S.D. 1994. *South Fork Power Project fish population monitoring 1993.* Prepared by Ebasco Environmental for Oroville-Wyandotte Irrigation District. Sacramento, California.

SECTION 6.6

CDEC (California Data Exchange Center). 2024. Ellery Lake (ERY) Precipitation Averages. CA.gov Department of Water Resources. Accessed: July 2024. Retrieved from: https://cdec.water.ca.gov/dynamicapp/profile?s=ERY&type=precip.

CDFW (California Department of Fish and Wildlife). 2022. California Natural Diversity Database (CNDDB) RareFind 5. Commercial Version, Biogeographic Data Branch. Accessed: July 2024. Retrieved from: https://wildlife.ca.gov/Data/CNDDB/Maps-and-Data.

eBird. 2024. View and Explore: Species Maps. Accessed: July 2024. Retrieved from: https://ebird.org/explore.

FERC (Federal Energy Regulatory Commission). 1992. *Final Environmental Assessment for Hydropower License.* Lee Vining FERC Project No. 1388-001. California. Washington, D.C.: Federal Energy Regulatory Commission, Office of Hydropower Licensing. December 30.

Jones & Stokes Associates. 1993. *Environmental Impact Report for the Review of Mono Basin Water Rights of the City of Los Angeles*. Draft. JSA 90-171. Prepared for California State Water Resources Control Board, Division of Water Rights [Lead Agency], Sacramento, California.

LADWP (Los Angeles Department of Water and Power). 1987. *Mono Basin Geology and Hydrology.* Los Angeles Department of Water and Power Aqueduct Division—Hydrology Section. March.

McCreedy, C. 2007. *Mono Basin Willow Flycatcher Project, 2007 Progress Report; PRBO Contribution #1579*. Petaluma, California: PRBO Conservation Science.

Millar, C.I., and W.B. Woolfenden. 1999. "The Role of Climate Change in Interpreting Historical Variability." *Ecological Applications* 9(4):1207–1216. Accessed: July 2024. Retrieved from: https://esajournals.onlinelibrary.wiley.com/doi/abs/10.1890/1051-0761%281999%29009%5B1207%3ATROCCI%5D2.0.CO%3B2.

USFS (U.S. Forest Service). 2019. *Land Management Plan for the Inyo National Forest. Fresno, Inyo, Madera, Mono and Tulare Counties, California; Esmeralda and Mineral Counties, Nevada*. R5-MB-323a. Pacific Southwest Region. September. Accessed: July 2024. Retrieved from: https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd664404.pdf.

USFWS (U.S. Fish and Wildlife Service). 2021. *Birds of Conservation Concern 2021: Migratory Bird Program*. Accessed: July 2024. Retrieved from: https://www.fws.gov/sites/default/files/documents/birds-of-conservation-concern-2021.pdf.

Vorster, P. 1985. "A Water Balance Forecast Model for Mono Lake, California." Thesis, Presented to the Faculty of California State University, Hayward. Mono Lake Committee, Mono Basin Clearinghouse. Accessed: July 2024. Retrieved from: https://www.monobasinresearch.org/onlinereports/waterbalance.php.

SECTION 6.7

CDFW (California Department of Fish and Wildlife). 2023. California Natural Communities List. Natural Communities List Arranged Alphabetically by Life Form. Sacramento, California: CDFW Biogeographic Data Branch. Accessed: July 2024. Retrieved from: https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=153398&inline.

Cal-IPC (California Invasive Plant Council). 2024. Cal-IPC Inventory. Berkeley, California. Accessed: July 2024. Retrieved from: https://www.cal-ipc.org/plants/inventory/.

CNPS (California Native Plant Society). 2020. IRare Plant Inventory (online edition, v9.5). Accessed: July 2024. Retrieved from: http://www.rareplants.cnps.org.

FERC (Federal Energy Regulatory Commission). 1992. *Final Environmental Assessment for Hydropower License*. Lee Vining FERC Project No. 1388-001. California. Washington, D.C.: Federal Energy Regulatory Commission, Office of Hydropower Licensing. December 30.

Jepson Flora Project. 2023. Jepson eFlora. The Jepson Herbarium. Regents of the University of California. Berkeley. December, Revision 12. Accessed: July 2024. Retrieved from: https://ucjeps.berkeley.edu/eflora/.

Kelch, D. 2015. *Pest Rating Proposals and Final Ratings: Cheatgrass (Bromus tectorum)*. California Department of Food and Agriculture. Accessed: July 2024. Retrieved from: https://blogs.cdfa.ca.gov/Section3162/?p=1375.

NRM–TESP/IS (Natural Resources Manager–Threatened, Endangered, and Sensitive Plants/Invasive Species). 2018. Botany At Risk Species and Invasive Species Inventory Database. Obtained from Inyo National Forest Staff on February 16, 2021. USDA Forest Service, Inyo National Forest. Bishop, California. April.

Psomas. 2006. *Determination of No Effect on Listed Species for Maintenance Activities to Rhinedollar Dam, Southern California Edison Company's Lee Vining Creek Hydro Project, Mono County, CA*. Santa Ana, California: Psomas.

Psomas. 2010. *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*. Prepared for: Southern California Edison, Eastern Hydro Division, San Dimas, California. Santa Ana, California.

Psomas. 2013. *Summary of Biological Resources Determination of No Effect on Listed Species for Southern California Edison Company's Tioga Lake Dams Geomembrane Liner Installation Project, Mono County, California.* Santa Ana, California: Psomas.

Read, E. 2012. *Lee Vining Creek (FERC No. 1388) Riparian, Aquatic Habitat, and Fish Population Monitoring: Phase 2 (Year 2) Compared to Baseline and 2006.* Prepared for Southern California Edison Company. Orange, California.

Read, E. 2017. *Lee Vining Creek (FERC No. 1388) Riparian Monitoring Phase 2 Year 3 (2016) Compared to Previous Years.* Prepared for Southern California Edison Company. Orange, California.

Read, E. 2022. *Lee Vining Creek (FERC No. 1388) Riparian Monitoring Phase 2, Year 4 (2021) Compared to Previous Years.* Prepared for Southern California Edison Company. Orange, California.

USFS (U.S. Forest Service). 2019. *Land Management Plan for the Inyo National Forest. Fresno, Inyo, Madera, Mono and Tulare Counties, California; Esmeralda and Mineral Counties, Nevada*. R5-MB-323a. Pacific Southwest Region. September. Accessed: July 2024. Retrieved from: https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd664404.pdf.

SECTION 6.8

Campbell, J.B., and R.H. Wynne. 2011. *Introduction to Remote Sensing, Fifth Edition*. New York: The Guilford Press.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. *Classification of Wetlands and Deepwater Habitats of the United States*. U.S. Fish and Wildlife Service. FWS/OBS-79/31. Washington, D.C.

FGDC (Federal Geographic Data Committee). 2013. *Classification of Wetlands and Deepwater Habitats of the United States* (FGDC-STD-004-2013, 2nd Ed.). Washington, D.C.: FGDC and U.S. Fish and Wildlife Service. Accessed: July 2024. Retrieved from: https://www.fgdc.gov/standards/projects/wetlands/index_html.

GISGeography. 2022. What is NDVI (Normalized Difference Vegetation Index)? Last updated May 30, 2022. Accessed: November 2022. Retrieved from: https://gisgeography.com/ndvi-normalized-difference-vegetation-index/.

Read, E. 2004. *Rush and Lee Vining Creeks Riparian Monitoring Baseline Summary*. Prepared for Southern California Edison Company. Costa Mesa, California.

Read, E. 2012. *Lee Vining Creek (FERC No. 1388) Riparian, Aquatic Habitat, and Fish Population Monitoring: Phase 2 (Year 2) Compared to Baseline and 2006*. Prepared for Southern California Edison Company. Orange, California.

Read, E. 2017. *Lee Vining Creek (FERC No. 1388) Riparian Monitoring Phase 2 Year 3 (2016) Compared to Previous Years*. Prepared for Southern California Edison Company. Orange, California.

Read, E. 2022. *Lee Vining Creek (FERC No. 1388) Riparian Monitoring Phase 2 Year 4 (2021) Compared to Previous Years*. Prepared for Southern California Edison Company. Orange, California.

USFS (U.S. Forest Service). 2019. *Land Management Plan for the Inyo National Forest: Fresno, Inyo, Madera, Mono, and Tulare Counties, California; Esmeralda and Mineral Counties, Nevada*. R5-MB-323a. Pacific Southwest Region. September. Accessed: July 2024. Retrieved from: https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd664404.pdf.

USFWS (U.S. Fish and Wildlife Service). 2020. Wetlands Mapper. Washington D.C.: USFWS, National Wetlands Inventory. Accessed: July 2024. Retrieved from: http://www.fws.gov/wetlands/Data/Mapper.html.

<u>SECTION 6.9</u>

Amberson, J., M. Keville, and C. Nelson. 2018. "Effects of Disturbance on Tree Community Dynamics in Whitebark Pine (*Pinus albicaulis* Engelm.) Ecosystems." *Forests* 9(9):566.

Brown, C., M.P. Hayes, G.A. Green, and D.C. Macfarlane. 2014. *Mountain Yellow-legged Frog Conservation Assessment for the Sierra Nevada Mountains of California, USA, A Collaborative Inter-Agency Project.* Vallejo, California: USDA Forest Service, Pacific Southwest Region. R5-TP-038. July.

Brown, C., M.P. Hayes, G.A. Green, D.C. Macfarlane, and A.J. Lind. 2015. *Yosemite Toad Conservation Assessment, A Collaborative Inter-Agency Project*. Vallejo, California: USDA Forest Service, Pacific Southwest Region. R5-TP-040. January.

Calflora. 2020. Calflora Homepage (a non-profit database providing information on wild California plants). Berkeley, California.

CDFW (California Department of Fish and Wildlife). 2020a. State and Federally Listed Endangered, Threatened, and Rare Plants of California. State of California, Natural Resources Agency, Department of Fish and Wildlife, Biogeographic Data Branch, California Natural Diversity Database (CNDDB). January 2.

CDFW (California Department of Fish and Wildlife). 2020b. California Natural Diversity Database (CNDDB) RareFind 5. Commercial Version, Biogeographic Data Branch. Accessed: April 20, 2020. Retrieved from: https://wildlife.ca.gov/data/cnddb.

CDFW (California Department of Fish and Wildlife). 2021. *Memo to SCE FERC Relicensing Terrestrial Working Group: CDFW's Inland Desert Region 6 High Mountain Lakes Project*. Bishop, California: CDFW Bishop Field Office.

CDFW (California Department of Fish and Wildlife). 2023a. *Special Animals List.* Sacramento, California: CDFW, Natural Heritage Division. October.

CDFW (California Department of Fish and Wildlife). 2023b. Rare Sighting of Wolverine Confirmed in Multiple California Counties. Sacramento, California: CDFW Office of Communications, Education and Outreach.

CDFW (California Department of Fish and Wildlife). 2024. *Sierra Nevada Bighorn Sheep Recovery Program Facts*. Accessed: July 2024. Retrieved from: https://wildlife.ca.gov/Conservation/Mammals/Bighorn-Sheep/Sierra-Nevada/Recovery-Program/Sheep-Facts.

CDFW (California Department of Fish and Wildlife) and California Fish & Game Commission. 2021. *California Fish and Game Code 2021 Edition*. Accessed: July 2024. Retrieved from: https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=178840&inline.

Dolanc, C.R., J.H. Thorne, and H.D. Safford. 2012. "Widespread shifts in the demographic structure of subalpine forests in the Sierra Nevada, California, 1934 to 2007." *Global Ecology and Biogeography* 22:264–276.

Environment and Climate Change Canada. 2017. *Recovery Strategy for the Whitebark Pine (Pinus albicaulis) in Canada [Proposed]*. Species at Risk Act Recovery Strategy Series. Environment and Climate Change Canada, Ottawa. viii + 54 pp.

FERC (Federal Energy Regulatory Commission). 1992. *Final Environmental Assessment for Hydropower License*. Lee Vining FERC Project No. 1388-001. California. Washington, D.C.: Federal Energy Regulatory Commission, Office of Hydropower Licensing. December 30.

Finch, D.M., S.I. Rothstein, J.C. Boren, W.L. Graf, J.L. Holechek, B.E. Kus, R.M. Marshall, M.M. Pohl, S.J. Sferra, M.K. Sogge, J.C. Stromberg, B.A. Valentine, M.J. Whitfield, and S.O. Williams, III. 2002. *Final recovery plan of the southwestern willow flycatcher* (*Empidonax traillii extimus*). Albuquerque, New Mexico: U.S. Fish and Wildlife Service, Region 2.

Flanary, S.J., and R.E. Keane. 2019. "Whitebark pine encroachment into lower-elevation sagebrush grasslands in southwest Montana, USA." *Fire Ecology* 15(42).

Goeking, S.A., D.K. Izlar, and T.C. Edwards. 2019. "A Landscape-Level Assessment of Whitebark Pine Regeneration in the Rocky Mountains, USA." *Forest Science* 65(1):87–99.

Inyo National Forest. 2019. *Persistence Analysis for Species of Conservation Concern Inyo National Forest*. Inyo National Forest, Region 5 Regional Office, and Washington Office Enterprise Program.

Jepson Flora Project. 2024. Jepson eFlora. The Jepson Herbarium. University of California, Berkeley. Accessed: June 28, 2020. Retrieved from: https://ucjeps.berkeley.edu/eflora/.

Jules, E.S., J.I. Jackson, P.J. van Mantgem, J.S. Beck, M.P. Murray, and E.A. Sahara. 2016. "The relative contributions of disease and insects in the decline of a long-lived tree: a stochastic demographic model of whitebark pine (Pinus albicaulis)." *Forest Ecology and Management* 381:144–156.

Keane, R.E., S.F. Arno, J.K. Brown, and D.F. Tomback. 1990. "Modeling stand dynamics in whitebark pine (Pinus albicaulis) forests." *Ecological Modeling* 51(1–2):73–95.

Keane, R.E., D.F. Tomback, C.A. Aubry, A.D. Bower, E.M. Campbell, C.L. Cripps, M.B. Jenkins, M.F. Mahalovich, M. Manning, S.T. McKinney, M.P. Murray, D.L. Perkins, D.P. Reinhart, C. Ryan, A.W. Schoettle, and C.M. Smith. 2012. *A Range-Wide Restoration Strategy for Whitebark Pine (Pinus albicaulis).* General Technical Report RMRS-GTR-279. Fort Collins, Colorado: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 108 p.

Leirfallom, S.B., R.E. Keane, D.F. Tomback, and S.Z. Dobrowski. 2015. “The effects of seed source health on whitebark pine (Pinus albicaulis) regeneration density after wildfire.” *Canadian Journal of Forest Research* 45:1597–1606.

Lind, B.M., C.J. Friedline, J.L. Wegrzyn, P.E. Maloney, D.R. Vogler, D.B. Neale, and A.J. Eckert. 2017. “Water availability drives signatures of local adaptation in whitebark pine (Pinus albicaulis Engelm) across fine spatial scales of the Lake Tahoe Basin, USA.” *Mol Ecol* 26:3168–3185.

Liu, J., H. Williams, X.R. Li., A.W. Schoettle, R.A. Sniezko, M. Murray, A. Zamany, G. Roke, and H. Chen. 2017. “Profiling methyl jasmonate-responsive transcriptome for understanding induced systemic resistance in whitebark pine (Pinus albicaulis).” *Plant Mol Biol* 95:359–374. Accessed: July 2024. Retrieved from: https://doi.org/10.1007/s11103-017-0655-z.

Loehman, R.A., R.E. Keane, L.M. Holsinger, and Z. Wu. 2017. “Interactions of landscape disturbances and climate change dictate ecological pattern and process: spatial modeling of wildfire, insect, and disease dynamics under future climates.” *Landscape Ecology* 32:1447–1459.

Maloney, P.E. 2014. “The multivariate underpinnings of recruitment for three Pinus species in montane forests of the Sierra Nevada, USA.” *Plant Ecol* 215:261–274. Accessed: July 2024. Retrieved from: https://doi.org/10.1007/s11258-013-0295-6.

McLane, S.C., and S.N. Aitken. 2012. “Whitebark pine (Pinus albicaulis) assisted migration potential: testing establishment north of the species range.” *Ecological Applications* 22(1):142–153.

Meyer, M.D., B. Bulaon, M. MacKenzie, and H.D. Safford. 2016. “Mortality, structure, and regeneration in whitebark pine stands impacted by mountain pine beetle in the southern Sierra Nevada.” *Canadian Journal of Forest Research* 46(4):572–581. Accessed: July 2024. Retrieved from: https://doi.org/10.1139/cjfr-2015-0464.

Millar, C.I., R.D. Westfall, D.L. Delany, M.J. Bokach, A.L. Flint, and L.E. Flint. 2012. “Forest mortality in high-elevation whitebark pine (Pinus albicaulis) forests of eastern California, USA; influence of environmental context, bark beetles, climatic water deficit, and warming.” *Canadian Journal of Forest Research* 42(4): 749–765. Accessed: July 2024. Retrieved from: https://doi.org/10.1139/x2012-031.

Moyle, P.B. 2002. *Inland Fishes of Californi*a. Berkeley: University of California Press.

Pansing, E.R., and D.F. Tomback. 2019. "Survival of Whitebark Pine Seedlings Grown from Direct Seeding: Implications for Regeneration and Restoration under Climate Change." *Forests* 10(8):677.

Read, E. 2017. *Lee Vining Creek (FERC No. 1388), Riparian Monitoring Phase 2 Year 3 (2016) Compared to Previous Years*. Prepared for Southern California Edison Company. Orange, California. February 13.

Retzlaff, M., R. Keane, D. Affleck, and S. Hood. 2018. "Growth Response of Whitebark Pine (Pinus albicaulis Engelm) Regeneration to Thinning and Prescribed Burn Treatments." *Forests* 9(6):311.

Salamunovich, T. 2017. *Fall 2016 Fish Population Survey, Upper Lee Vining Creek, Mono County, California. Draft Report*. Prepared for E Read & Associates Inc. by Normandeau Associates, Arcata, California. February 13.

Slaton, M.R., M. MacKenzie, T. Kohler, and C.M. Ramirez. 2019. "Whitebark Pine Recruitment in Sierra Nevada Driven by Range Position and Disturbance History." *Forests* 10(5):455.

USFS (U.S. Forest Service). 2001. *Ansel Adams, John Muir, and Dinkey Lakes Wilderness Management Plan, Final Environmental Impact Statement, Inyo and Sierra National Forests*. Biological Assessment/Biological Evaluation. Accessed: August 2020. Retrieved from: https://www.fs.usda.gov/detailfull/inyo/landmanagement/planning/?cid=FSBDEV3_003888&width=full.

USFS (U.S. Forest Service). 2019. *Land Management Plan for the Inyo National Forest: Fresno, Inyo, Madera, Mono, and Tulare Counties, California; Esmeralda and Mineral Counties, Nevada.* R5-MB-323a. Pacific Southwest Region. September. Accessed: February 28, 2024. Retrieved from: https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd664404.pdf.

USFWS (U.S. Fish and Wildlife Service). 1998. *Owens Basin Wetland and Aquatic Species Recovery Plan, Inyo and Mono Counties, California*. Region 1. Portland, Oregon.

USFWS (U.S. Fish and Wildlife Service). 2004. *Revised Recovery Plan for the Paiute Cutthroat Trout (Oncorhynchus clarki seleniris)*. Region 1. Portland, Oregon. ix + 105 pp.

USFWS (U.S. Fish and Wildlife Service). 2007. *Recovery Plan for the Sierra Nevada Big Horn Sheep*. California/Nevada Operations Office. Sacramento, California. xiv + 199 pages.

USFWS (U.S. Fish and Wildlife Service). 2014. *Programmatic Biological Opinion on Nine Forest Programs on Nine National Forests in the Sierra Nevada of California for the Endangered Sierra Nevada Yellow-legged Frog, Endangered Northern Distinct Population Segment of the Mountain Yellow-legged Frog, and Threatened Yosemite Toad*. Sacramento, California. December 19.

USFWS (U.S. Fish and Wildlife Service). 2016. *Final Species Report, Fisher (Pekania pennanti), West Coast Population*. March.

USFWS (U.S. Fish and Wildlife Service). 2017. *Amendment of the Programmatic Biological Opinion on Nine Forest Programs on Nine National Forests in the Sierra Nevada of California for the Endangered Sierra Nevada Yellow-legged Frog, Endangered Northern Distinct Population Segment of the Mountain Yellow-legged Frog, and Threatened Yosemite Toad*. Sacramento, California.

USFWS (U.S. Fish and Wildlife Service). 2021. *Species Status Assessment Report for the Whitebark Pine, Pinus albicalis*. Prepared by the Wyoming Ecological Services Field Office. December 2021, version 1.3. Accessed: July 2024. Retrieved from: https://ecos.fws.gov/ServCat/DownloadFile/226045.

Zielinski, W.J., R.L. Truex, G. Schmidt, R. Schlexer, K.N. Schmidt, and R.H. Barrett. 2004. “Home range characteristics of fishers in California.” *Journal of Mammalogy* 85(4):649–657.

SECTION 6.10

Adventure Projects, Inc. 2021. “Map of Lee vining area showing approach hike.” Mountain Project. Accessed: June 2021. Retrieved from: https://www.mountainproject.com/photo/107490759.

CDFW (California Department of Fish and Wildlife). 2023. Fishing Guide. Accessed: December 2023. Retrieved from: https://apps.wildlife.ca.gov/fishing/.

DPR (California Department of Parks and Recreation). 2013. *Outdoor Recreation in California’s Regions 2013*. Sacramento, California.

DPR (California Department of Parks and Recreation). 2014. *Survey on Public Opinions and Attitudes on Outdoor Recreation in California 2012*. Sacramento, California.

DPR (California Department of Parks and Recreation). 2020. California’s Vision for Park Equity 2000–2020: Transforming Park Access with Data and Technology. Sacramento, California.

DPR (California Department of Parks and Recreation). 2021. California’s 2021-2025 Statewide Comprehensive Outdoor Recreation Plan (SCORP). Sacramento, California.

FERC (Federal Energy Regulatory Commission). 1992. *Final Environmental Assessment for Hydropower License*. Lee Vining FERC Project No. 1388-001. California. Washington, D.C.: Federal Energy Regulatory Commission, Office of Hydropower Licensing. December 30.

NPS (National Park Service). 2023. Historical Seasonal Opening and Closing Dates. Accessed: December 2023. Retrieved from: https://www.nps.gov/yose/planyourvisit/seasonal.htm.

REI (Recreational Equipment, Inc.). 2020. Beyond the Guidebook. Mountain Project. Accessed: August 2020. Retrieved from: https://www.mountainproject.com/.

SCE (Southern California Edison). 2021. *Lee Vining Hydroelectric Project (FERC Project No. 1388) Preliminary Application Document*. August.

USFS (U.S. Forest Service). 2018a. National Forest System Trails GIS layer. Obtained from Inyo National Forest Staff on August 28, 2018.

USFS (U.S. Forest Service). 2018b. *Visitor Use Report*. Inyo NF, USDA Forest Service, Region 5, National Visitor Use Monitoring Data collected FY 2016. United States Department of Agriculture.

USFS (U.S. Forest Service). 2019. *Land Management Plan for the Inyo National Forest. Fresno, Inyo, Madera, Mono and Tulare Counties, California; Esmeralda and Mineral Counties, Nevada*. R5-MB-323a. Pacific Southwest Region. September. Accessed: December 2023. Retrieved from: https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd664404.pdf.

USFS (U.S. Forest Service). 2020a. *Inyo National Forest Visitor Guide*. Accessed: December 2023. Retrieved from: https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd550643.pdf.

USFS (U.S. Forest Service). 2020b. Campground Camping. Accessed: December 2023. Retrieved from: https://www.fs.usda.gov/activity/inyo/recreation/camping-cabins/?recid=20228&actid=29.

SECTION 6.11

CAL FIRE (California Department of Forestry and Fire Protection). 2020. Fire Perimeters and SRA/FRA/LRA GIS Data. Accessed: July 2020. Retrieved from: https://www.fire.ca.gov/what-we-do/fire-resource-assessment-program.

CAL FIRE (California Department of Forestry and Fire Protection). 2024. Cooperative Efforts. Accessed: July 2024. Retrieved from: https://www.fire.ca.gov/what-we-do/fire-protection/cooperative-efforts/.

Kleinschmidt Associates. 2018. *Fire Suppression Plan—June Action Item*. Memorandum. August 8, 2018. Prepared for Bishop Creek Technical Work Group Members.

MRLC Consortium (Multi-Resolution Land Characteristic Consortium). 2023. Multi-Resolution Land Characteristics Consortium. Accessed: July 2024. Retrieved from: https://www.mrlc.gov.

USFS (U.S. Forest Service). 2019. *Land Management Plan for the Inyo National Forest: Fresno, Inyo, Madera, Mono, and Tulare Counties, California; Esmeralda and Mineral Counties, Nevada*. R5-MB-323a. Pacific Southwest Region. Accessed: July 2024. Retrieved from: https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd664404.pdf.

USFS (U.S. Forest Service). 2020. *Inyo National Forest Visitors Guide*. Accessed: July 2024. Retrieved from: https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd550643.pdf.

<u>SECTION 6.12</u>

Cal Highways. 2024. State Route 120. Accessed: July 2024. Retrieved from: https://www.cahighways.org/ROUTE120.html.

FERC (Federal Energy Regulatory Commission). 1997. Order Issuing New License. Project No. 1388-001. February 4.

MCC (Mono County California). No Date. Mono Lake. Accessed: July 2024. Retrieved from: https://www.monocounty.org/places-to-go/mono-lake/.

NPS (National Park Service). 2023. Annual Park Recreation Visitation: Yosemite National Park. Accessed: July 2024. Retrieved from: https://irma.nps.gov/Stats/SSRSReports/Park%20Specific%20Reports/Annual%20Park%20Recreation%20Visitation%20(1904%20-%20Last%20Calendar%20Year)?Park=YOSEhttps://irma.nps.gov/Stats/.

SCE (Southern California Edison). 1997. Plan for the Design and Construction of Project Facilities in Order to Preserve or Enhance Visual Quality. September 1997.

USDOT (U.S. Department of Transportation, Federal Highway Administration). No Date. Tioga Road/Big Oak Flat Road. Accessed: December 2023. Retrieved from: https://www.byways.org/explore/byways/tioga-road-big-oak-flat-road/.

USFS (U.S. Forest Service). 2019. *Land Management Plan for the Inyo National Forest: Fresno, Inyo, Madera, Mono and Tulare Counties, California; Esmeralda and Mineral Counties, Nevada*. R5-MB-323a. Pacific Southwest Region. September. Accessed: December 2023. Retrieved from: https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd664404.pdf.

USFS (U.S. Forest Service). 2023. Inyo Mountains Wilderness. Accessed: December 2023. Retrieved from: https://www.fs.usda.gov/recarea/inyo/recreation/recarea/?recid=21880.

USFS (U.S. Forest Service). 2024. Wild and Scenic Rivers Eligibility Table and Map, Inyo National Forest. Accessed: July 2024. Retrieved from: https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd550572.pdf.

SECTION 6.13

Ali, G.A.H. 2018. *Late Glacial and Deglacial Fluctuations of Mono Lake, California.* PhD dissertation, Graduate School of Arts and Science, Columbia University, New York.

AMS (Army Map Service). 1948. Mariposa, United States. Map. Scale 1:250000. Corps of Engineers, Department of the Army, Washington, D.C. Accessed: November 11, 2022. Retrieved from: https://ngmdb.usgs.gov/topoview/viewer/#15/37.9800/-119.2834.

Antevs, E. 1948. Climatic Changes and Pre-white Man. In *University of Utah Bulletin* 38:168–191.

Basgall, M.E. 1983. *Archaeology of the Forest Service Forty Site (CA-MNO-529), Mono County, California*. On file, US Department of Agriculture, Inyo National Forest, Bishop, California.

Basgall, M.E. 1987. Paleoindian Occupation in Central-Eastern California: the Komodo Site. In *Current Research in the Pleistocene* 4:50–54.

Basgall, M.E. 1988. Archaeology of the Komodo Site, an Early Holocene Occupation in Central-Eastern California. *Early Human Occupation in Far Western North America: The Clovis-Archaic Interface.* Edited by J.A. Willig, C.M. Aikins, and J.L. Fagan, pp. 103-119. In *Nevada State Anthropological Papers*, 21, Carson City.

Basgall, M.E. 1989. Obsidian Acquisition and Use in Prehistoric Central-eastern California. In *Current Directions in California Obsidian Studies*, edited by R.E. Hughes, pp. 111–126. Contributions of the University of California Archaeological Research Facility 45, Berkeley.

Basgall, M.E. 1991. The Archaeology of Nelson Basin and Adjacent Areas, Fort Irwin, San Bernardino County, California. Submitted to U.S. Army Corps of Engineers, Los Angeles, California.

Basgall, M.E. 1998. *Phase II Evaluation of Archaeological Site CA-MNO-1977, on the Little Walker River, Mono County, California*. Archaeological Research Center, Technical Report 5. Submitted to Sierra Environmental Analysis Branch Caltrans District 6, Fresno, California.

Basgall, M.E. 2009. Understanding Pre-Newberry Prehistory in the Inyo-Mono Region. In *California Archaeology* 1:303–304.

Basgall, M.E., and M.A. Giambastiani. 1995. *Prehistoric Use of a Marginal Environment: Continuity and Change in Occupation of the Volcanic Tablelands, Mono and Inyo Counties, California*. Center for Archaeological Research at Davis Publications 12. University of California, Davis.

Basgall, M.E., and K.R. McGuire. 1988. *The Archaeology of CA-INY-30: Prehistoric Culture Change in the Southern Owens Valley, California*. Submitted to California Department of Transportation, Sacramento.

Bettinger, R.L. 1977. Aboriginal Human Ecology in Owens Valley: Prehistoric Change in the Great Basin. In *American Antiquity* 42(1):3–17.

Bettinger, R.L. 1981. *Archaeology of the Lee Vining Site, FS# 05-04-51-219 (CA-MNO-446), Mono County, California.* Submitted to U.S. Department of Agriculture Forest Service, Inyo National Forest, Bishop, California.

Bettinger, R.L. 1982. “Aboriginal Exchange and Territoriality in Owens Valley, California.” In *Contexts for Prehistoric Exchange*, edited by J. Ericson and T. Earle. New York: Academic Press.

Bettinger, R.L. 1989. The Archaeology of Pinyon House, Two Eagles, and Crater Middens: Three Residential Sites in Owens Valley, Eastern California. In *Anthropological Papers of the American Museum of Natural History* 67, New York.

Bettinger, R.L. 1999a. From Traveler to Processor: Regional Trajectories of Hunter-Gatherer Sedentism in the Inyo-Mono Region, California. In *Settlement Pattern Studies in the Americas: Fifty Years Since Viru*, edited by B.R. Billman and G.M. Feinman, pp. 39–55. Washington, D.C: Smithsonian Institution Press.

Bettinger, R.L. 1999b. What Happened in the Medithermal. In *Models for the Millennium: The Current Status of Great Basin Anthropology*, edited by C. Beck, pp. 62–74. Salt Lake City: University of Utah Press.

Bettinger, R.L., and M.A. Baumhoff. 1982. The Numic Spread: Great Basin Cultures in Competition. In *American Antiquity* 47:485–503.

Bettinger, R.L., and T.F. King. 1971. Interaction and Political Organization: A Theoretical Framework for Archaeology in Owens Valley, California. In *Annual Reports of the University of California Archaeological Survey* 13:139–150. Los Angeles.

Bettinger, R.L., and R.E. Taylor. 1974. Suggested Revisions in Archaeological Sequences of the Great Basin in Interior Southern California. In *Nevada Archaeological Survey Research Papers* 5:1–26.

Bieling, D.G. 1992. Perspectives on Behavior Gained from Lithic Analysis and Archaeological Investigations Near Bridgeport, Mono County, California. Master's thesis, Department of Cultural Resources Management, Sonoma State University, Rohnert Park, California.

Cain, E. 1961. *The Story of Early Mono County*. San Francisco: Fearon Publishers, Inc.

Carle, D., and D. Banta. 2008. *Images of America: Mono Lake Basin*. Charleston, South Carolina: Acadia Publishing.

Carpenter, K.L. 2001. *Data Recovery Investigations at CA-MNO-891 and CA-MNO-2416/H.* Prepared for Caltrans District 9, Bishop, California.

Chappell, M. 1947. Early History of Mono County. C*alifornia Historical Society Quarterly* 26(3): 233–248. Accessed: July 15, 2020. Retrieved from: https://online.ucpress.edu/ch/article/26/3/233/27843/Early-History-of-Mono-County.

Clay, V., and J. King. 2019. *Cultural Resources Survey of 1,992 Acres in the Bodie Hills and Conway Summit Area, Mono County, California*. Submitted to BLM Bishop Field Office/Inyo National Forest, Bishop, California.

Coleman, D.S., W. Gray, and A.F. Glazner. 2004. Rethinking the Emplacement and Evolution of Zoned Plutons: Geochronologic Evidence for Incremental Assembly of the Tuolumne Intrusive Suite, California." In *Geology* 32(5):433–436.

Cooper, D.J., J.D. Lundquist, J. King, A. Flint, E. Wolf, F.C. Lott, and J. Roche. 2006. *Effects of Tioga Road on Hydrologic Processes and Lodgepole Pine Invasion into Tuolumne Meadows, Yosemite National Park*. Submitted to Division of Resources Management and Science USDI National Park Service, Yosemite National Park.

Costello, J., and J. Marvin. 1983. Archaeological Site Record for CA-MNO-2764H. Prepared for Caltrans District 9, Bishop, California.

Cutts, J.S. 1997. *Tioga Pass Resort Evaluation for National Register Eligibility*. On file, Inyo National Forest.

Davis, E.L. 1965. "An Ethnography of the Kuzedika Paiute of Mono Lake, Mono County, California." In *University of Utah Anthropological Papers* 75:1–56.

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.

Delacorte, M.G. 1990. *The Prehistory of Deep Springs Valley, Eastern California: Adaptive Variation in the Western Great Basin*. PhD dissertation, Department of Anthropology, University of California, Davis.

Delacorte, M.G. 1999. T*he Changing Role of Riverine Environments in the Prehistory of the Central-Western Great Basin: Data Recovery Excavations at Six Prehistoric Sites in Owens Valley, California*. Submitted to Caltrans District 9, Bishop, California.

Delacorte, M.G., and K.R. McGuire. 1993. *Report of Archaeological Test Evaluations at Twenty-Three Sites in Owens Valley, California*. Submitted to Contel of California Inc., and the U.S. Department of Interior, Bureau of Land Management, California Desert District, Ridgecrest, California.

Delacorte, M.G., M.C. Hall, and M.E. Basgall. 1995. *Final Report on the Evaluation of Twelve Archaeological Sites in the Southern Owens Valley, Inyo County, California.* Submitted to Caltrans District 9, Bishop, California.

Diamond, V., and R. Hicks. 1988. *Historic Overview of the Rush Creek and Lee Vining Creek Hydroelectric Projects.* Prepared for Southern California Edison Company, Rosemead, California.

Elston, R.G., D. Zeanah, and B. Codding. 2014. "Living Outside the Box: An Updated Perspective on Diet Breadth and Sexual Division of Labor in the Prearchaic Great Basin." In *Quaternary International* 352:200–211.

Ericson, J.E. 1982. "Production for Obsidian Exchange in California." In *Contexts for Prehistoric Exchange*, edited by J.E. Ericson and T.K. Earle, pp. 129–148. New York: Academic Press.

Fredrickson, D.A. 1991. *Archaeological Evaluation of CA-MNO-2456, -2488, and -564, near Bridgeport, Mono County, California*. Prepared for Caltrans District 9, Bishop, California.

Fredrickson, D.A. 1998. *An Archaeological Evaluation of CA-MNO-566 and -2466, Huntoon Valley, Mono County, California*. Submitted to the California Department of Transportation, District 9, Bishop, California.

Giambastiani, M.A. 1998. *Phase II Evaluation of Archaeological Site CA-MNO-3018, Near Sonora Pass, Mono County, California*. Submitted to Southern Sierra Environmental Analysis Brach, Caltrans District 6, Fresno, California.

Gillespie, A., and P.H. Zehfuss. 2004. "Glaciations of the Sierra Nevada, California, USA." In *Quaternary Glaciations - Extent and Chronology, Part II*, edited by J. Ehlers, and P.L. Gibbard, pp. 51–62. Amsterdam: Elsevier Science.

Gilreath, A.J. 1995. *Archaeological Evaluations of Thirteen Sites for the Ash Creek Project, Inyo County, California*. Submitted to California Department of Transportation, District 9, Bishop, California.

Gilreath, A.J., and W.R. Hildebrandt. 1997. *Prehistoric Use of the Coso Volcanic Field.* Contributions to the University of California Archaeological Research Facility, No. 56. Berkeley.

Gilreath, A.J., and W.R. Hildebrandt. 2011. Current Perspectives on the Production and Conveyance of Coso Obsidian. In *Perspectives on Prehistoric Trade and Exchange in California and the Great Basin*, edited by R.E. Hughes, pp. 171–188. Salt Lake: University of Utah Press.

GLO (General Land Office). 2022. Historical Index Page for Township 1 North Range 245 East of the Mount Diablo Meridian, California. Accessed: November 7, 2022. Retrieved from: https://glorecords.blm.gov/ConvertedImages/LSR_54395_Sheet_1.PDF.

Goldberg, S.K., E.J. Skinner, and J.F. Burton. 1990. *Archaeological Investigations at Sites CA-MNO-574, -577, -578, and -833: Stoneworking in Mono County, California*. Submitted to Caltrans, District 9, Bishop California.

Halford, F.K. 1998. *Archaeology and Environment on the Dry Lakes Plateau, Bodie Hills, California: Hunter-Gatherer Coping Strategies for Holocene Environmental Variability.* Master's thesis, University of Nevada, Reno.

Halford, F.K. 2001. "New Evidence for Early Holocene Acquisition and Production of Bodie Hills Obsidian." *Society for California Archaeology Newsletter* 35(1):32–37.

Halford, F.K. 2008. *The Coleville and Bodie Hills NRCS Soil Inventory, Walker and Bridgeport, California: A Reevaluation of the Bodie Hills Obsidian Source (CA-MNO-4527) and its Spatial and Chronological Use*. Prepared for U.S. Department of Interior, Bureau of Land Management, Bishop, California.

Hall, M.C. 1983. L*ate 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.

Hall, M.C. 1990. *The OXBOW Archaeological Incident: Investigations at Twenty-three Locations Between Owens Valley, Eastern California, and Walker Basin, Southwestern Nevada.* Submitted to Oxbow Geothermal Company, Reno, Nevada.

Hodelka, B.N., M.M. McGlue, S. Zimmerman, G. Ali, and I. Tunno. 2020. "Paleoproduction and environmental change at Mono Lake (eastern Sierra Nevada) during the Pleistocene-Holocene Transition." *Palaeogeography, Palaeoclimatology, Palaeoecology* 543.

Hull, K.L., R.W. Bevill, W.G. Spaulding, and M.R. Hale. 1995. *Archaeological Site Subsurface Survey, Test Excavations, and Data-Recovery Excavations for the Tuolumne Meadows Sewer Replacement Project in Tuolumne Meadows, Yosemite National Park, California.* Yosemite Research Center Publications in Anthropology 14. Yosemite Research Center, Yosemite National Park, National Park Service.

Inyo National Forest. 1997. Memorandum to Bob Agard, Tioga Pass Resort. August 27, 1997. On file at SCE, Rosemead, California.

Jackson, R.J. 1985. *An Archaeological Survey of the Wet, Antelope, Railroad, and Ford Timber Sale Compartments in the Inyo National Forest.* Submitted to U.S. Department of Agriculture Forest Service, Inyo National Forest, Bishop, California.

Jenkins, D.L., and C.N. Warren. 1984. "Obsidian Hydration and the Pinto Chronology in the Mojave Desert." In *Journal of California and Great Basin Anthropology* 6(1): 44–60.

King, J.H., W.R. Hildebrandt, and J. Rosenthal. 2011. "Evaluating Alternative Models for the Conveyance of Bodie Hills Obsidian into Central California*."* In *Perspectives on Prehistoric Trade and Exchange in California and the Great Basin*, edited by R. E. Hughes, pp.148–170. Salt Lake City: University of Utah Press.

Kissinger, Krystal, and Jacqueline Beidl. DPR523 Site Record for Saddlebag Lake Resort (FS 05-04-51-01804). On file at SCE, Rosemead, California.

McGuire, K.R. 1994. *Archaeological Resources Evaluation at CA-MNO-2743, CA-MNO-2744, CA-MNO-2747, and CA-MNO-2763H, Mono County, California.* Prepared for Caltrans Office of Environmental Analysis, Sacramento.

Mensing, S.A., J. Smith, K.B. Norman, and M. Allan. 2008. "Extended Drought in the Great Basin of Western North America in the Last Two Millennia Reconstructed from Pollen Records." In *Quaternary International* 188:79–89.

Montague, S.T. 1996. *The Dana Meadows Archaeological Testing Project, Yosemite National Park, Tuolumne County, California*. Yosemite Research Center Publications in Anthropology No. 19, Yosemite National Park.

Montague, S.T. 2010. *High-Elevation Prehistoric Land Use in the Central Sierra Nevada, Yosemite National Park, California*. Master's thesis, Department of Anthropology, California State University Sacramento, Sacramento, California.

Moratto, M.J. 1999. "Culture Chronology 1: The Regional Data." In *Archaeological Synthesis and Research Design. Yosemite National Park, California*, edited by Kathleen L. Hull and Michael J. Moratto, pp 65–120. USDI National Park Service, Yosemite Research Center, Publications in Anthropology 21, Yosemite National Park.

Noble, D.G. 1992. *Archaeological Excavations at CA-MNO-2213, On Highway 395 at Fales Hot Springs, Mono County, California*. Prepared for Caltrans District 9, Bishop, California.

NPS (National Park Service). 1997. *How To Apply the National Register Criteria for Evaluation*. National Register Bulletin 15. Accessed: May 15, 2021. Retrieved from: https://www.nps.gov/subjects/nationalregister/upload/NRB-15_web508.pdf.

NPS (National Park Service). 2000. *Guidelines for Evaluating and Registering Archeological Properties*. National Register Bulletin 36. Accessed: May 1, 2024. Retrieved from: https://www.nps.gov/subjects/nationalregister/upload/NRB36-Complete.pdf.

OHP (California Office of Historic Preservation). 1995. *Instructions for Recording Historical Resources.* California Office of Historic Preservation, Sacramento, California.

Overly, S.A. 2002. *Phase III Data Recovery at CA-MNO-3018 Near Sonora Pass, Mono County, California: High Altitude Archaeology on the East Slope of the Sierra Nevada*. Prepared for Caltrans, District 9, Bishop, California.

Overly, S.A. 2004*. Below the Crest: Excavation of CA-MNO-3494 at Sonora Pass, Mono County, California*. Prepared for Caltrans, District 9, Bishop, California.

Peak, A.S. 1975. *Archaeological Investigations in Inyo and Mono Counties, California*. Master's thesis, Department of Anthropology, California State University, Sacramento.

Polanco, Juliann. 2022. Letter dated March 23, 2022, RE: Section 106 Consultation for the Relicensing of the Southern California Edison Lee Vining Hydroelectric Project (FERC No. 1388-081) Inyo County, California. (Reference No. FERC831003C).

Rosenthal, J. 2012. *Prehistoric Land Use and Settlement Systems in Yosemite National Park: A View from Crane Flat. Yosemite National Park, California*. Publications in Anthropology No. 39.

SCE (Southern California Edison). 2022. *Revised Technical Study Plans*. Lee Vining Hydroelectric Project, FERC Project No. 1388. February 18, 2022.

Selters, A. 2012. *Images of America: Inyo National Forest*. Charleston, South Carolina: Acadia Publishing.

Spaulding, G.W. 1999. "Paleoenvironmental Studies*.*" In *Archaeological Synthesis and Research Design, Yosemite National Park, California*, edited by Michael J. Moratto, pp. 29–64. Publications in Anthropology No. 21, Yosemite Research Center.

Stevens, N., and M. Lenzi. 2015. *Archaeological Survey of 1,000 Acres on the Marine Corps Mountain Warfare Training Center near Bridgeport, Mono County, California*. Prepared for Naval Facilities Engineering Command, Southwest Division, San Diego, California.

Stevens, N.E., M. Lenzi, and V. Clay. 2015. *Testing of 21 Archaeological Sites on the Marine Corps Mountain Warfare Training Center near Bridgeport, Mono County, California*. Prepared for Naval Facilities Engineering Command, Southwest Division, San Diego, California.

Stine, S. 1994. "Extreme and Persistent Drought in California and Patagonia During Mediaeval Time." *Nature* 369:546–549.

Switalski, H., and A. Bardlsey. 2011. *Archaeological Survey Report and Historic Resource Evaluation for The Rhinedollar (Overhead) 12kV Distribution Circuit Rebuild Project (6085-4800, 8-4816), Lee Vining Creek Hydroelectric System, Inyo National Forest, Mono County, California*. Prepared for Southern California Edison Company, Rosemead, California.

Theodoratus, D. 1984. *Cultural Resources Overview of the Southern Sierra Nevada: An Ethnographic, Linguistic, Archaeological, and Historic Study of the Sierra National Forest, Sequoia National Forest, and Bakersfield District of the Bureau of Land Management*. United States Department of Agriculture, Bishop, California.

Thomas, D.H. 1981. "How to Classify the Projectile Points from Monitor Valley, Nevada." In *Journal of California and Great Basin Anthropology* 3(1):7–43.

Trexler, K. 1980. *Tioga Road: A History 1883-1961*. First Published 1961, Revised 1975; 1980.Yosemite Association in Cooperation with the National Park Service, Yosemite National Park, California.

USFS (U.S. Forest Service). 2019. *Land Management Plan for the Inyo National Forest. Fresno, Inyo, Madera, Mono and Tulare Counties, California; Esmeralda and Mineral Counties, Nevada*. R5-MB-323a. Pacific Southwest Region. September. Accessed: August 24, 2020. Retrieved from: https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd664404.pdf.

USGS (U.S. Geological Survey). 1901. Mt Lyell, CA. Map. Scale 1:125,000. U.S. Geological Survey. Accessed: November 9, 2022. Retrieved from: https://ngmdb.usgs.gov/topoview/viewer/#14/37.9452/-119.2594.

USGS (U.S. Geological Survey). 1910. Mt Lyell, CA. Map. Scale 1:125,000. Edition of May 1901, reprinted in February 1910. U.S. Geological Survey. Accessed: November 9, 2022. Retrieved from: https://ngmdb.usgs.gov/topoview/viewer/#14/37.9452/-119.2594.

USGS (U.S. Geological Survey). 1955. Mono Craters, Calif. Map. Scale 1:62,500. U.S. Department of the Interior, Geological Survey. Accessed: November 9, 2022. Retrieved from: https://ngmdb.usgs.gov/topoview/viewer/#14/37.9452/-119.2594.

USGS (U.S. Geological Survey). 1960. Tuolumne Meadows, CA. Map. Scale 1:62,500. 1956 map printed in 1960. U.S. Department of the Interior, Geological Survey. Accessed: November 10, 2022. Retrieved from: https://ngmdb.usgs.gov/topoview/viewer/#15/37.9800/-119.2834.

USSG (U.S. Surveyor General). 1895. Township No. 1 North, Range No. 25 East, Mount Diablo Meridian (Plat). Accessed: November 9, 2022. Retrieved from: https://glorecords.blm.gov/details/survey/default.aspx?dm_id=299360&sid=alnmx1l4.i1o#surveyDetailsTabIndex=1.

USSG (U.S. Surveyor General). 1925. Resurvey of Part of Township No. 1 North, Range No. 25 East, Mount Diablo Meridian (Plat). Accessed: November 9, 2022. Retrieved from: https://glorecords.blm.gov/details/survey/default.aspx?dm_id=299362&sid=alnmx1l4.i1o#surveyDetailsTabIndex=1.

Warren, C.N., and R.H. Crabtree. 1986. “Prehistory of the Southwestern Area.” In *Great Basin*, edited by W. L. d’Azevedo, pp. 183–193. *Handbook of North American Indians*. Vol. 11, W.C.S. general editor. Washington, D.C: Smithsonian Institution.

White, D. 1985a. *Results of the 1984 Field Season, Cultural Resources Survey, for the Historic and Archaeological Preservation Plan for Eastern Sierra Hydroelectric Projects, In Mono and Inyo Counties, California: Lundy (FERC Project 1390), Lee Vining Creek (FERC Project 1388, Rush Creek (FERC Project 1389), and Bishop Creek (FERC Project 1394).* Prepared for Southern California Edison Company, Rosemead, California.

White, D. 1985b. *Results of the 1985 Field Season, Cultural Resources Survey, for the Historic and Archaeological Preservation Plan for Eastern Sierra Hydroelectric Projects, In Mono and Inyo Counties, California: Lee Vining Creek (FERC Project 1388) and Rush Creek (FERC Project 1389).* Prepared for Southern California Edison Company, Rosemead, California.

White, D. 1990. *Historic and Archaeological Preservation Plan for the Lee Vining Creek Hydroelectric Project (FERC Project 1388), Inyo, California.* Prepared for Southern California Edison Company, Rosemead, California.

Wickstrom, B.P., and R. Jackson. 1993. *Archaeological Resources Evaluation at CA-MNO-891, CA-MNO-2678, and CA-MNO-2679, Mono County, California.* Prepared for Caltrans District 9, Bishop, California.

Widell, Cherilyn. 1997. Re: Determination of Eligibility for the Tioga Pass Resort, Inyo National Forest, Mono County. July 29. On file at SCE, Rosemead, California.

Williams, J., and R. Hicks. 1989. *Evaluation of the Historic Resources of The Lee Vining Creek (FERC Project 1388) and Rush Creek (FERC Project 1389) Hydro Electric Systems, Mono County, California*. Prepared for Southern California Edison Company, Rosemead, California.

Woolfenden, W., and P. Conners. 2007. *A Thematic Evaluation of Pack Stations in the Eastern Sierra Nevada Operating on the Inyo and Sierra National Forests, California*. Prepared for Inyo and Sierra National Forests, California.

York, A. 1990. *An Evaluation of Twenty-One Archaeological Sites on the Lee Vining Creek, Rush Creek, and Lundy Hydroelectric Projects, Mono and Inyo Counties, California*. Prepared for Southern California Edison Company, Rosemead, California.

SECTION 6.14

ACHP (Advisory Council on Historic Preservation). 2021. *Consultation with Indian Tribes in the Section 106 Review Process: The Handbook*. Washington, D.C.: Advisory Council on Historic Preservation. Accessed: February 13, 2024. Retrieved from: https://www.achp.gov/sites/default/files/2021-06/ConsultationwithIndianTribesHandbook6-11-21Final_0.pdf.

Bates, Craig D., and Martha J. Lee. 1990. *Tradition and Innovation: A Basket History of the Indians of the Yosemite-Mono Lake Area.* Yosemite National Park, California: Yosemite Association.

BLM (Bureau of Land Management). No Date. General Land Office Records. Accessed: August 2024. Retrieved from: https://glorecords.blm.gov/search/default.aspx.

Busby, Colin, John M. Findlay, and James C. Bard. 1980. 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.

Davis, Emma Lou. No Date. Studies in the Region of Mono Lake, Mono County, California. Manuscript. Los Angeles: University of California.

Davis, Emma Lou. 1962. “Hunter-Gatherers of Mono Lake.” *Masterkey* 36(1):23–28.

Davis, Emma Lou. 1963. “The Desert Culture of the Western Great Basin: A Lifeway of Seasonal Transhumance.” *American Antiquity* 29:202–212.

Davis, Emma Lou. 1964. “An Archaeological Survey of the Mono Lake Basin and Excavations of Two Rockshelters, Mono County, California.” *UCLA Archaeological Survey Annual Report.*

Davis, Emma Lou. 1965. "An Ethnography of the Kuzedika Paiute of Mono Lake, Mono County, California." *University of Utah Anthropological Papers* 75:1–56.

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

Davis-King, Shelly. 2010. *Amid the Sagebrush Plain, Atop the Lofty Peaks: Native American History in Mono County, California*. Submitted to California Department of Transportation, District 9, Bishop, California.

Davis-King, Shelly, and James B. Snyder. 2010. The Silver Thread: Upper Tuolumne River American Indian Land Use in Yosemite National Park: Ethnographic Context for the Tuolumne Wild and Scenic River Comprehensive Management Plan and Environmental Impact Statement, Tuolumne County, California. Submitted to USDA, National Park Service, Yosemite National Park, California.

Dondero, John. 1992. Interview by Ilene Mandelbaum, Mono Lake Committee, with John Dondero, Lee Vining, California, April 3, 1992. Mono Basin Clearinghouse. Accessed: February 21, 2024. Retrieved from: https://www.monobasinresearch.org/historical/interviews/dondero.php.

Durant, Jessie. 1991. Interview by Emilie Strauss, Jones & Stokes Associates, with Mrs. Jessie Durant (1913–2015), Bishop, California, October 13, 1991. Mono Basin Clearinghouse. Accessed: February 21, 2024. Retrieved from: https://www.monobasinresearch.org/historical/interviews/durant.php.

Fletcher, Thomas Christopher. 1982. "The Mono Basin in the Nineteenth Century: Discovery, Settlement, Land Use." Master's Thesis, Department of Geography, University of California, Berkeley.

Fowler, Catherine S., Compiler and Editor. 1989. *Willard Z. Park's Ethnographic Notes on the Northern Paiute of Western Nevada, 1933-1944*. Volume I. University of Utah Anthropological Papers 114. Salt Lake City.

Fowler, Catherine S., and S. Liljeblad. 1986. "Northern Paiute." In *Handbook of North American Indians, Volume 11: Great Basin*, edited by Warren L. d'Azevedo, pp. 435–465. Washington, D.C.: Smithsonian Institution.

Frear, S.A., P. Lusignan, L. Davidson, and J.H. Ernstein. 2022. "The Power of Place: Traditional Cultural Places in the 21st Century." Presentation given November 2, 2022, at the National Trust's 2022 PastForward conference. Accessed: February 23, 2024. Retrieved from: https://parkplanning.nps.gov/document.cfm?parkID=442&projectID=107663&documentID=124754.

Great Basin College. No Date. Great Basin Indian Archives, Document Collection: Paiute. Accessed: July 2024. Retrieved from: https://www.gbcnv.edu/gbia/gbia_docs_paiutes.html.

Hess, August, and Jerry Andrews. 1991. Interviews by Ilene Mandelbaum, Mono Lake Committee, and Emilie Strauss, Jones & Stokes Associates, with Mr. August Hess and Mr. Jerry Andrews, Mono Lake, October 29, 1991, and December 20, 1991. Mono Basin Clearinghouse. Accessed: February 21, 2024. Retrieved from: https://www.monobasinresearch.org/historical/interviews/hess-andrewsint.php.

Hulse, Frederick S. 1935. Lee Vining Paiute Ethnographic Notes. On file, Bancroft Library, University of California, Berkeley.

Jones & Stokes Associates. 1993. "Cultural Resources." Chapter K. In *Environmental Impact Report for the Review of Mono Basin Water Rights of the City of Los Angeles.* Draft. May. (JSA 90-171.) Prepared for California State Water Resources Control Board, Division of Water Rights, Sacramento, California

Marks, Robert B. 2023. "Dispossessed Again: Paiute Land Allotments in the Mono Basin, 1907-1929." *Eastern Sierra History Journal* 4(1). Accessed: March 13, 2024. Retrieved from: https://scholarship.claremont.edu/eshj/vol4/iss1/1.

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. "Chapter 5 – Ethnographic Interviews and Results." In Cultural Resources Inventory of Four Tributaries to Mono Lake, and an Evaluation Plan for the Mono Streams Restoration Project ARR #05-04-679, Volume 1, by Amy J. Gilreath. Report prepared by Far Western Anthropological Group, Inc. for the Los Angeles Department of Water and Power.

McGuire, Kelly R., and Julia G. Costello. 1994. Highway 395 Rush Creek Four-Lane Project (09-MNO-395, 45.0/51.3, EA 213100), Archaeological Resources Evaluation at CA-MNO-2743, CA-MNO-2744, CA-MNO-2747, and CA-MNO-2763H: Final Report. Sacramento, California: California Department of Transportation.

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. Berkeley: University of California Press.

Merriam, C. Hart. 1966. *Ethnographic Notes on California Indian Tribes*. Edited by R.F. Heizer Parts 1 and 2, University of California, Archaeological Survey Records 68 (1, 2). Berkeley.

Merriam, C. Hart. 1979a. "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. Socorro, New Mexico: Ballena Press.

Merriam, C. Hart. 1979b. "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. Socorro, New Mexico: Ballena Press.

Mono Lake Committee. 2024. State of the Lake. Accessed: August 2024. Retrieved from: https://www.monolake.org/learn/stateofthelake/.

NPS (National Park Service). 1998. "Guidelines for Evaluating and Documenting Traditional Cultural Properties." *National Register of Historic Places Bulletin 38*.

NPS (National Park Service). 2019. Voices of the People: The Traditionally Associated Tribes of Yosemite National Park. National Park Service, Yosemite Conservancy.

NPS (National Park Service). 2023. *National Register Bulletin: Identifying, Evaluating, and Documenting Traditional Cultural Places.* Draft, November 6, 2023. Accessed: February 5, 2024. Retrieved from: https://parkplanning.nps.gov/document.cfm?parkID=442&projectID=107663&documentID=133455.

Polanco, Juliann. 2022. Letter dated March 23, 2022, RE: Section 106 Consultation for the Relicensing of the Southern California Edison Lee Vining Hydroelectric Project (FERC No. 1388-081) Inyo County, California. (Reference No. FERC831003C).

Steward, Julian H. 1933. “Ethnography of the Owens Valley Paiute.” *University of California Publications in American Archaeology and Ethnology* 33(3):233–350. Berkeley, California: University of California Press. Accessed: August 2024. Retrieved from: https://digitalassets.lib.berkeley.edu/anthpubs/ucb/text/ucp033-004.pdf.

Steward, Julian H. 1936. “Myths of the Owens Valley Paiute.” *University of California Publications in American Archaeology and Ethnology* 34(5):355–440. Berkeley, California: University of California Press. Accessed: August 2024. Retrieved from: https://www.dotycoyote.com/pdfs/sources/steward_paiute.pdf.

USFS (U.S. Forest Service). 2019. *Land Management Plan for the Inyo National Forest: Fresno, Inyo, Madera, Mono, and Tulare Counties, California; Esmeralda and Mineral Counties, Nevada*. R5-MB-323a. Pacific Southwest Region. September. Accessed: July 2024. Retrieved from: https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd664404.pdf.

White, David. 1990. Historic and Archaeological Preservation Plan for the Lee Vining Creek Hydroelectric Project (HPMP) (FERC Project No. 1388), Mono County, California. Prepared for Southern California Edison Company, Rosemead, California. April 1990.

SECTION 6.15

CEDD (California Employment Development Department). 2021. Mono County Profile. Accessed: July 2024. Retrieved from: https://labormarketinfo.edd.ca.gov/geography/mono-county.html.

Data USA. 2021. Lee Vining, CA. Accessed: July 2024. Retrieved from: https://datausa.io/profile/geo/lee-vining-ca/.

LVCOC (Lee Vining Chamber of Commerce). 2024. Lee Vining, California. Chamber of Commerce Official Site. Accessed: July 2024. Retrieved from: https://www.leevining.com/.

MCED (Mono County Economic Development). 2023. Welcome to Mono County, Lee Vining. Accessed: July 2024. Retrieved from: https://www.monocountyeconomicdevelopment.com/lee-vining/.

Mono County. 2009. General Plan. Accessed: July 2024. Retrieved from: https://monocounty.ca.gov/planning/page/general-plan.

MRLC Consortium (Multi-Resolution Land Characteristic Consortium). 2023. Multi-Resolution Land Characteristics Consortium. Accessed: July 2024. Retrieved from: https://www.mrlc.gov/.

PMVEIT (Profile of Mono Visitors and Economic Impacts of Tourism). 2019. Mono County California. Accessed: July 2024. Retrieved from: https://monocounty.ca.gov/sites/default/files/fileattachments/economic_development/page/31221/mono_co_2018_visitor_econ_imp_study_report.pdf.

U.S. Census (U.S. Census Bureau). 2010. P1 Race. Accessed: July 2024. Retrieved from: https://data.census.gov/table/DECENNIALPL2010.P1?g=040XX00US22&y=2010.

U.S. Census (U.S. Census Bureau). 2017. Quick Facts | Tuolumne County, California; California; Mono County, California; United States. Accessed: July 2024. Retrieved from: https://www.census.gov/quickfacts/fact/table/tuolumnecountycalifornia,CA,monocountycalifornia,US/SBO001217#SBO001217.

U.S. Census (U.S. Census Bureau). 2019. ACS Demographic and Housing Estimates: Lee Vining, California. Accessed: July 2024. Retrieved from: https://data.census.gov/cedsci/table?q=Lee%20Vining,%20California&g=1600000US0640998&tid=ACSDP5Y2019.DP05&hidePreview=false.

U.S. Census (U.S. Census Bureau). 2020. B01003 | Total Population. Accessed: July 2024. Retrieved from: https://data.census.gov/table/ACSDT5Y2020.B01003?q=B01003&g=160XX00US0640998.

U.S. Census (U.S. Census Bureau). 2021. B01003 | Total Population. Accessed: July 2024. Retrieved from: https://data.census.gov/table/ACSDT5Y2021.B01003?q=B01003&g=160XX00US0640998.

U.S. Census (U.S. Census Bureau). 2022a. B01003 | Total Population. Accessed: July 2024. Accessed: May 29, 2024. Retrieved from: https://data.census.gov/table/ACSDT5Y2022.B01003?q=B01003&g=160XX00US0640998.

U.S. Census (U.S. Census Bureau). 2022b. Mono County Profile. Accessed: July 2024. Retrieved from: https://data.census.gov/table/ACSDT5Y2022.B01003?g=050XX00US06051&y=2022&d=ACS%205-Year%20Estimates%20Detailed%20Tables.

U.S. Census (U.S. Census Bureau). 2022c. State of California Profile. Accessed: July 2024. Retrieved from: https://data.census.gov/table?g=040XX00US06&d=ACS%205-Year%20Estimates%20Subject%20Tables.

U.S. Census (U.S. Census Bureau). 2022d. S1901 | Income in the Past 12 Months. Accessed: July 2024. Retrieved from: https://data.census.gov/table/ACSST5Y2022.S1901?g=160XX00US4575850.

U.S. Census (U.S. Census Bureau). 2022e. S1101 | Households and Families. Accessed: July 2024. Retrieved from: https://data.census.gov/table/ACSST5Y2022.S1101.

U.S. Census (U.S. Census Bureau). 2022f. S1701 | Poverty Status in the Past 12 Months. Accessed: July 2024. Retrieved from: https://data.census.gov/table/ACSST5Y2022.S1701?t=Income%20and%20Poverty&g=050XX00US06051_1500000US060510001024&y=2022.

U.S. Census (U.S. Census Bureau). 2022g. S1901 | Income in the Past 12 Months. Accessed: July 2024. Retrieved from: https://data.census.gov/table/ACSST5Y2022.S1901?g=050XX00US06109&y=2022.

U.S. Census (U.S. Census Bureau). 2022h. S1101 | Households and Families. Accessed: July 2024. Retrieved from: https://data.census.gov/table/ACSST5Y2022.S1101?g=050XX00US06109&y=2022.

U.S. Census (U.S. Census Bureau). 2022i. S1701 | Poverty Status in the Past 12 Months. Accessed: July 2024. Retrieved from: https://data.census.gov/table/ACSST5Y2022.S1701?g=050XX00US06109&y=2022.

U.S. Census (U.S. Census Bureau). 2023. Quick Facts | Tuolumne County, California; California; Mono County, California; United States. Accessed: July 2024. Retrieved from: https://www.census.gov/quickfacts/fact/table/tuolumnecountycalifornia,CA,monocountycalifornia,US/PST045223.

U.S. Census (U.S. Census Bureau). 2024a. B01003 | Total Population. Accessed: July 2024. Retrieved from: https://data.census.gov/table/ACSDT5Y2022.B01003?q=Population%20Total&g=050XX00US06051.

U.S. Census (U.S. Census Bureau). 2024b. B01003 | Total Population. Accessed: July 2024. Retrieved from: https://data.census.gov/table/ACSDT5Y2022.B01003?q=Population%20Total&g=050XX00US06109.

USFS (U.S. Forest Service). 2019. *Land Management Plan for the Inyo National Forest. Fresno, Inyo, Madera, Mono and Tulare Counties, California; Esmeralda and Mineral Counties, Nevada*. R5-MB-323a. Pacific Southwest Region. September. Accessed: July 2024. Retrieved from: https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd664404.pdf.

SECTION 6.16

LRWQCB (Lahontan Region Water Quality Control Board). 2019. *Water Quality Control Plan for the Lahontan Region* (as amended). First published in 1995, revised 2019. Accessed: August 2023. Retrieved from: https://www.waterboards.ca.gov/lahontan/water_issues/programs/basin_plan/references.html.

U.S. Census (U.S. Census Bureau). 2022. American Community survey 5-year data (2022). Census.gov. Accessed: March 1, 2024. Retrieved from: https://www2.census.gov/programs-surveys/acs/summary_file/2022/table-based-SF/data/5YRData/.

USEPA (U.S. Environmental Protection Agency). 2016. *Promising Practices for EJ Methodologies in NEPA Reviews*. Accessed: July 2024. Retrieved from: https://www.epa.gov/sites/default/files/2016-08/documents/nepa_promising_practices_document_2016.pdf.

USFS (U.S. Forest Service). 2019. *Land Management Plan for the Inyo National Forest. Fresno, Inyo, Madera, Mono, and Tulare Counties, California; Esmeralda and Mineral Counties, Nevada*. R5-MB-323a. Pacific Southwest Region. September. Accessed: July 2024. Retrieved from: https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd664404.pdf.

SECTION 7.0

None.

SECTION 8.0

FERC (Federal Energy Regulatory Commission). 2023. Comprehensive Plans. California. Accessed: March 19, 2024. Retrieved from: https://cms.ferc.gov/media/comprehensive-plans.

LRWQCB (Lahontan Region Water Quality Control Board). 2019. *Water Quality Control Plan for the Lahontan Region* (as amended). First published in 1995, revised 2019. Accessed: July 2024. Retrieved from: https://www.waterboards.ca.gov/lahontan/water_issues/programs/basin_plan/references.html.

USFS (U.S. Forest Service). 2019. *Land Management Plan for the Inyo National Forest: Fresno, Inyo, Madera, Mono, and Tulare Counties, California; Esmeralda and Mineral Counties, Nevada*. R5-MB-323a. Pacific Southwest Region. September. Accessed: July 2024. Retrieved from: https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd664404.pdf.

SECTION 9.0

None.

SOUTHERN CALIFORNIA EDISON
LEE VINING HYDROELECTRIC PROJECT
(FERC PROJECT NO. 1388)

EXHIBIT G
DRAFT LICENSE APPLICATION

SOUTHERN CALIFORNIA EDISON®
Energy for What's Ahead℠

September 2024

SOUTHERN CALIFORNIA EDISON

Lee Vining Hydroelectric Project
(FERC Project No. 1388)

Draft License Application
EXHIBIT G: Project Maps

Southern California Edison
2244 Walnut Grove Avenue
Rosemead, CA 91770

September 2024

Support from:

Kleinschmidt

Exhibit G: Project Maps

Title 18 of the Code of Federal Regulations (CFR), Section 4.51 (License for Major Project—Existing Dam) includes a description of information that an applicant must include in Exhibit G of its license application.

Exhibit G is a map of the project that must conform to the specifications of 18 CFR § 4.39. In addition to the other components of Exhibit G, the Applicant must provide the project boundary data in a geo-referenced electronic format—such as ArcView shape files, GeoMedia files, MapInfo files, or any similar format. The electronic boundary data must be positionally accurate to ±40 feet, in order to comply with the National Map Accuracy Standards for maps at a 1:24,000 scale (the scale of United States Geological Survey) quadrangle maps). The electronic exhibit G data must include a text file describing the map projection used (i.e., Universal Transverse Mercator, State Plane, Decimal Degrees, etc.), the map datum (i.e., feet, meters, miles, etc.). Three sets of the maps must be submitted on compact disk or other appropriate electronic media. If more than one sheet is used for the paper maps, the sheets must be numbered consecutively, and each sheet must bear a small insert sketch showing the entire project and indicate that portion of the project depicted on that sheet. Each sheet must contain a minimum of three known reference points. The latitude and longitude coordinates, or state plane coordinates, of each reference point must be shown. If at any time after the application is filed there is any change in the project boundary, the applicant must submit, within 90 days following the completion of project construction, a final Exhibit G showing the extent of such changes. The map must show:

(1) *Location of the project and principal features*. The map must show the location of the project as a whole with reference to the affected stream or other body of water and, if possible, to a nearby town or any other permanent monuments or objects, such as roads, transmission lines or other structures, that can be noted on the map and recognized in the field. The map must also show the relative locations and physical interrelationships of the principal project works and other features described under paragraph (b) of this section (Exhibit A).

(2) *Project boundary*. The map must show a project boundary enclosing all project works and other features described under paragraph (b) of this section (Exhibit A) that are to be licensed. If accurate survey information is not available at the time the application is filed, the applicant must so state, and a tentative boundary may be submitted. The boundary must enclose only those lands necessary for operation and maintenance of the project and for other project purposes, such as recreation, shoreline control, or protection of environmental resources (see paragraph (f) of this section (Exhibit E)). Existing residential, commercial, or other structures may be included within the boundary only to the extent that underlying lands are needed for project purposes (e.g., for flowage, public recreation, shoreline control, or protection of environmental resources). If the boundary is on land covered by a public survey, ties must be shown on the map at sufficient points to permit accurate platting of the position of the boundary relative to the lines of the public land survey. If the lands are not covered by a public land survey, the best available legal description of the position of the boundary must be provided, including distances and directions from fixed monuments or physical features. The boundary must be described as follows:

(i) *Impoundments*.

(A) The boundary around a project impoundment must be described by one of the following:

(1) Contour lines, including the contour elevation (preferred method);

(2) Specified courses and distances (metes and bounds);

(3) If the project lands are covered by a public land survey, lines upon or parallel to the lines of the survey; or

(4) Any combination of the above methods.

(B) The boundary must be located no more than 200 feet (horizontal measurement) from the exterior margin of the reservoir, defined by the normal maximum surface elevation, except where deviations may be necessary in describing the boundary according to the above methods or where additional lands are necessary for project purposes, such as public recreation, shoreline control, or protection of environmental resources.

(ii) *Continuous features*. The boundary around linear (continuous) project features such as access roads, transmission lines, and conduits may be described by specified distances from center lines or offset lines of survey. The width of such corridors must not exceed 200 feet unless good cause is shown for a greater width. Several sections of a continuous feature may be shown on a single sheet with information showing the sequence of contiguous sections.

(iii) *Noncontinuous features*.

(A) The boundary around noncontinuous project works such as dams, spillways, and powerhouses must be described by one of the following:

(1) Contour lines;

(2) Specified courses and distances;

(3) If the project lands are covered by a public land survey, lines upon or parallel to the lines of the survey; or

(4) Any combination of the above methods.

(B) The boundary must enclose only those lands that are necessary for safe and efficient operation and maintenance of the project or for other specified project purposes, such as public recreation or protection of environmental resources.

(3) *Federal lands.* Any public lands and reservations of the United States (Federal lands) [see 16 U.S.C. 796 (1) and (2)] that are within the project boundary, such as lands administered by the U.S. Forest Service, Bureau of Land Management, or National Park Service, or Indian tribal lands, and the boundaries of those Federal lands, must be identified as such on the map by:

(i) Legal subdivisions of a public land survey of the affected area (a protraction of identified township and section lines is sufficient for this purpose); and

(ii) The Federal agency, identified by symbol or legend, that maintains or manages each identified subdivision of the public land survey within the project boundary; or

(iii) In the absence of a public land survey, the location of the Federal lands according to the distances and directions from fixed monuments or physical features. When a Federal survey monument or a Federal bench mark will be destroyed or rendered unusable by the construction of project works, at least two permanent, marked witness monuments or bench marks must be established at accessible points. The maps show the location (and elevation, for bench marks) of the survey monument or bench mark which will be destroyed or rendered unusable, as well as of the witness monuments or bench marks. Connecting courses and distances from the witness monuments or bench marks to the original must also be shown.

(iv) The project location must include the most current information pertaining to affected Federal lands as described under 18 CFR § 4.81(b)(5).

(4) *Non-Federal lands.* For those lands within the project boundary not identified under paragraph (h)(3) of this section, the map must identify by legal subdivision:

(i) Lands owned in fee by the applicant and lands that the applicant plans to acquire in fee; and

(ii) Lands over which the applicant has acquired or plans to acquire rights to occupancy and use other than fee title, including rights acquired or to be acquired by easement or lease.

Proposed FERC Project Boundary

Pursuant to guidance from the Federal Energy Regulatory Commission (FERC)—Code of Federal Regulations, Title 18, Section 4.51(h)—the FERC Project Boundary must encompass all lands necessary for Lee Vining Hydroelectric Project (FERC Project No. 1388) (Project) operation and maintenance purposes over the term of the FERC license.

Advancements in technology such as Global Positioning Systems, Light Detection and Ranging imagery, and improved aerial imagery have allowed for greater accuracy in the depiction of Project facilities both on the exhibits and in the electronic geographic information system files to be submitted to FERC, resulting in minor boundary modifications.

The proposed FERC Project Boundary was developed through a review of the existing FERC Project Boundary and an inventory of Project lands as well as operation and maintenance activities.

The draft Exhibit G maps included in this DLA for the Project are listed in Table G-1 and provided Appendix G.1.

Table G-1 Draft Exhibit G Maps

Sheet No.	Description
1	Saddlebag Lake and Dam
2	Lee Vining Creek
3	Ellery Lake and Dam
4	Tioga Lake and Dam
5	Poole Penstock

Table G-2 identifies areas of addition and removal for the proposed FERC Project Boundary.

Table G-2 Proposed FERC Project Boundary Additions and Removals

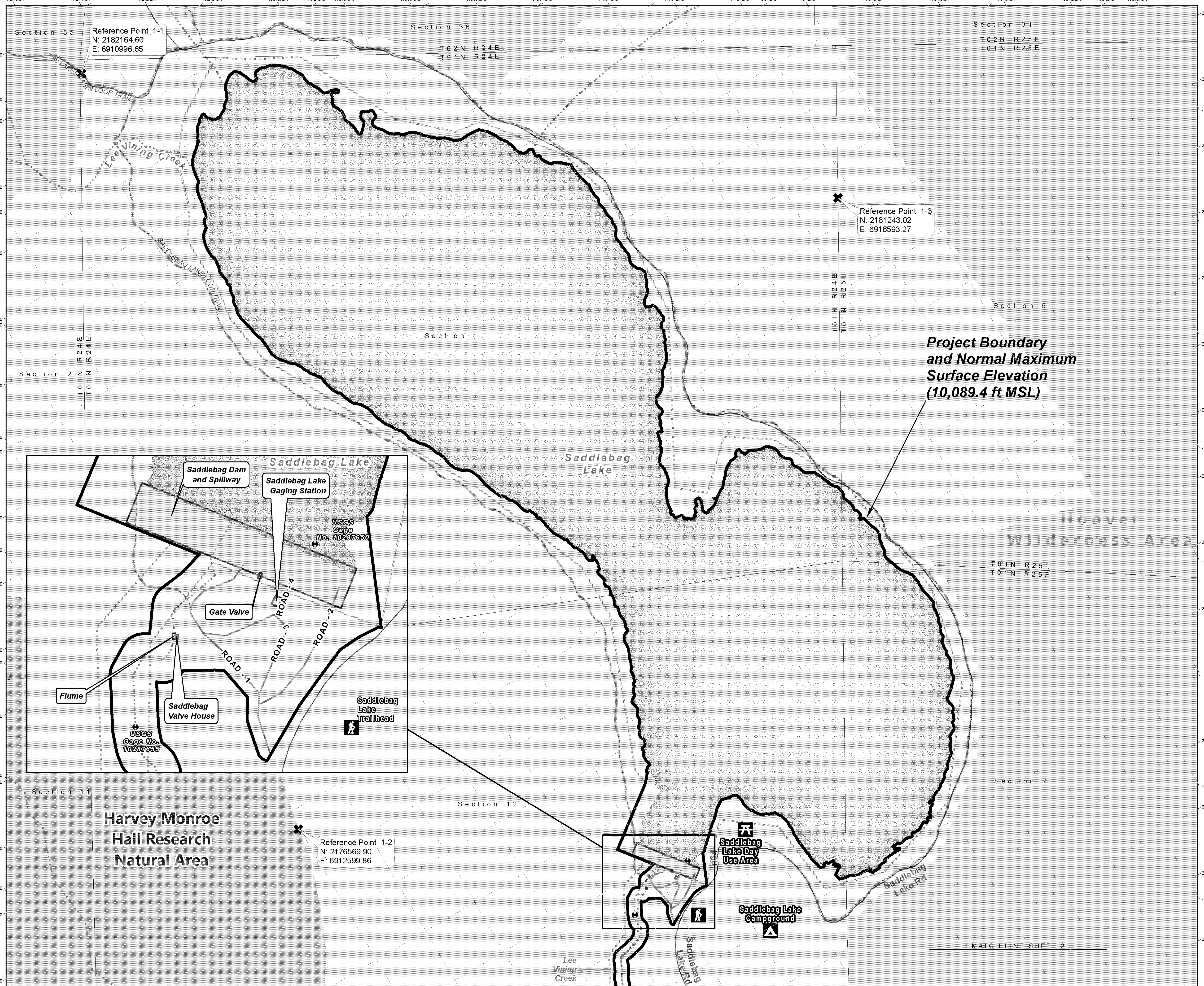
Action	Acreage	Location	Landowner
Addition	2.05	Saddlebag Dam	U.S. Forest Service
Addition	0.66	Tioga Dam	U.S. Forest Service
Removal	11.45	Ellery Lake	Southern California Edison

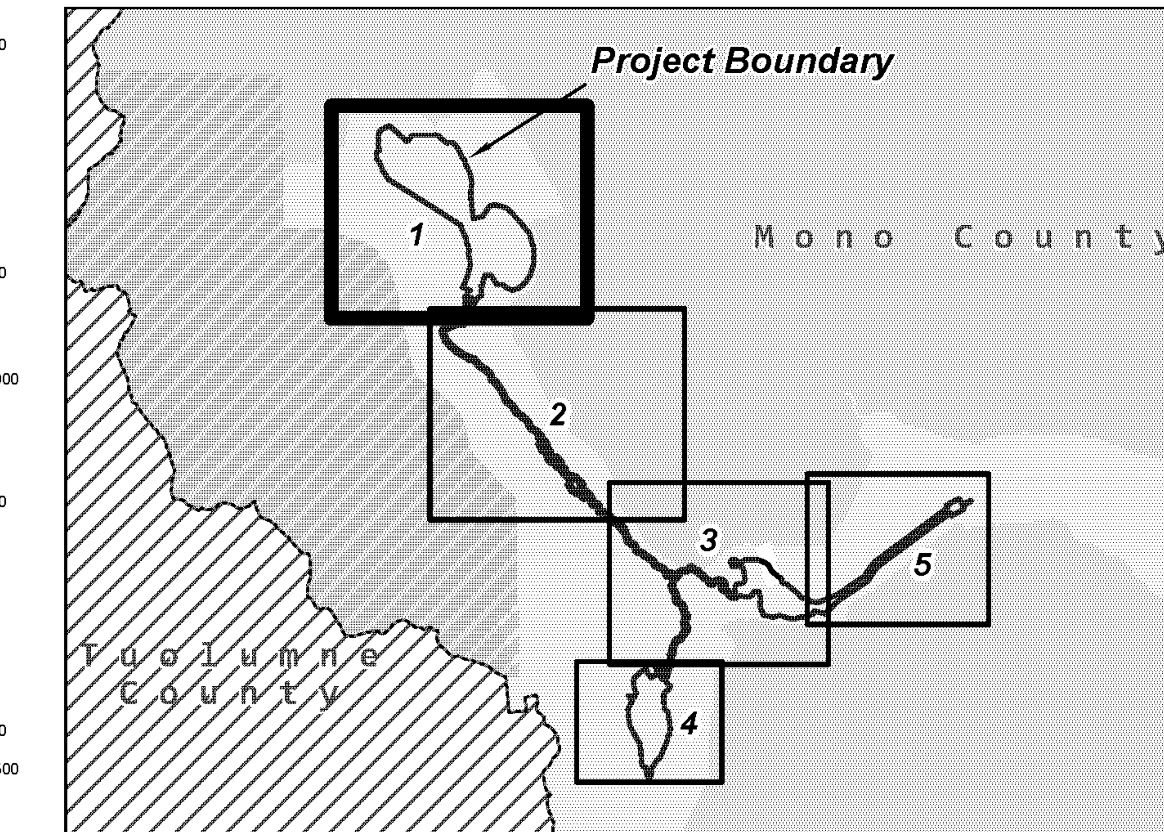
Within the proposed FERC Project Boundary, land ownership has been adjusted as shown in Table G-3.

Table G-3 Land Ownership in the Proposed FERC Project Boundary

Ownership	Acreage	Percentage of Total
U.S. Forest Service	535.99	98.8
Southern California Edison	6.26	1.2
Total Project Acreage	542.25	100.0

APPENDIX G.1
MAPS





TN
MN
12.48°E
4/24/2024

- Project Boundary (Proposed)
- Project Boundary (Existing)
- Match Line
- Reference Point
- Project Facilities
- Project Stream Gage
- Hydrography
- Project Flowlines
- Poole Penstock
- Poole Tunnel
- Road
- Project Road
- PLSS Section
- SCE-Owned Land
- Inyo National Forest
- Wilderness Area
- Research Natural Area
- National Park
- County
- Transmission (Non-Project)
- USFS Trails
- USFS Recreation Site
- Campground
- Day Use Area
- Pullout
- Trailhead

Map notes:
1. The Lee Vining Project is located in the State of California in Mono County.
2. Reference Point coordinates are shown in NAD 1983 StatePlane California III FIPS 0403 Ft US.
3. Elevations shown are referenced to Mean Sea Level (MSL). As part of the endorheic basin of Mono Lake, the location of the Lee Vining Hydroelectric Project is not significantly affected by tidal influences, thus, MSL is equal to the National Geodetic Vertical Datum of 1929 (NGVD 29) at the Project's location.
4. Licensee has acquired all flowage rights and title in fee or the right to use in perpetuity all lands necessary or appropriate for the construction, maintenance, and operation of the Project. All property records are kept on file with the licensee.
5. The project encompasses 535.99 acres of federal lands managed by the United States Forest Service within the Inyo National Forest.
6. The Project boundary description, as required by 18 CFR 4.41, is represented here by a grid of Northings and Eastings around, and graticules within, the map frame. Any position in Northings and Eastings along the Project boundary can be determined using these references.
7. At the time of this Exhibit G, no publicly available lidar data were available in the Project's vicinity. The Project boundary, in part, was digitized from NAIP aerial imagery (60-cm resolution) captured on August 12, 2022, and Google Earth/Airbus imagery captured on August 8, 2023, delineating the normal maximum surface elevations for the Ellery, Tioga, and Saddlebag reservoirs.

The Surveyor Stamp will be added to this Exhibit G subsequent to FERC approval of the Proposed Lee Vining Project Boundary

SOUTHERN CALIFORNIA EDISON

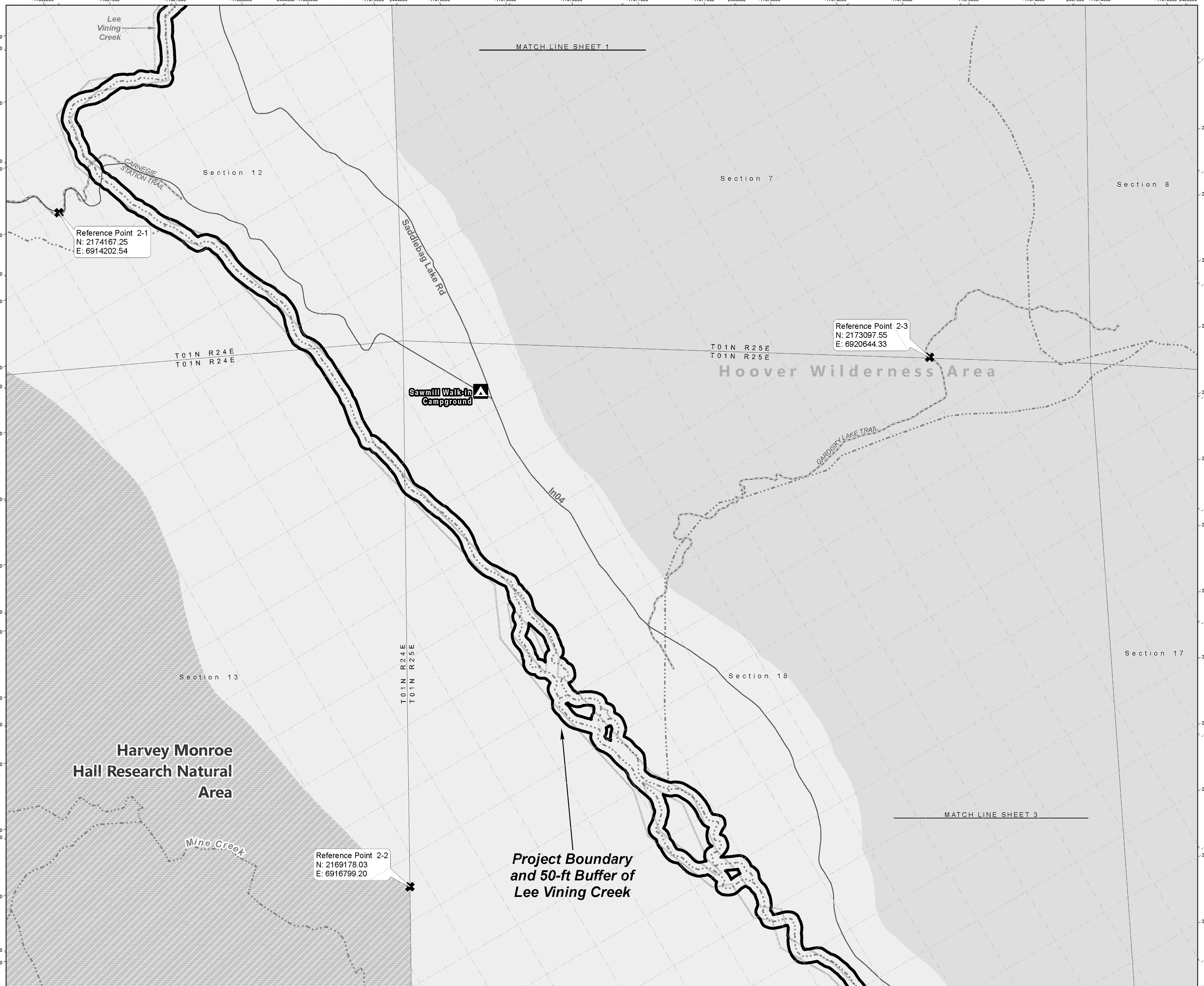
LEE VINING HYDROELECTRIC PROJECT
FERC NO. 1388

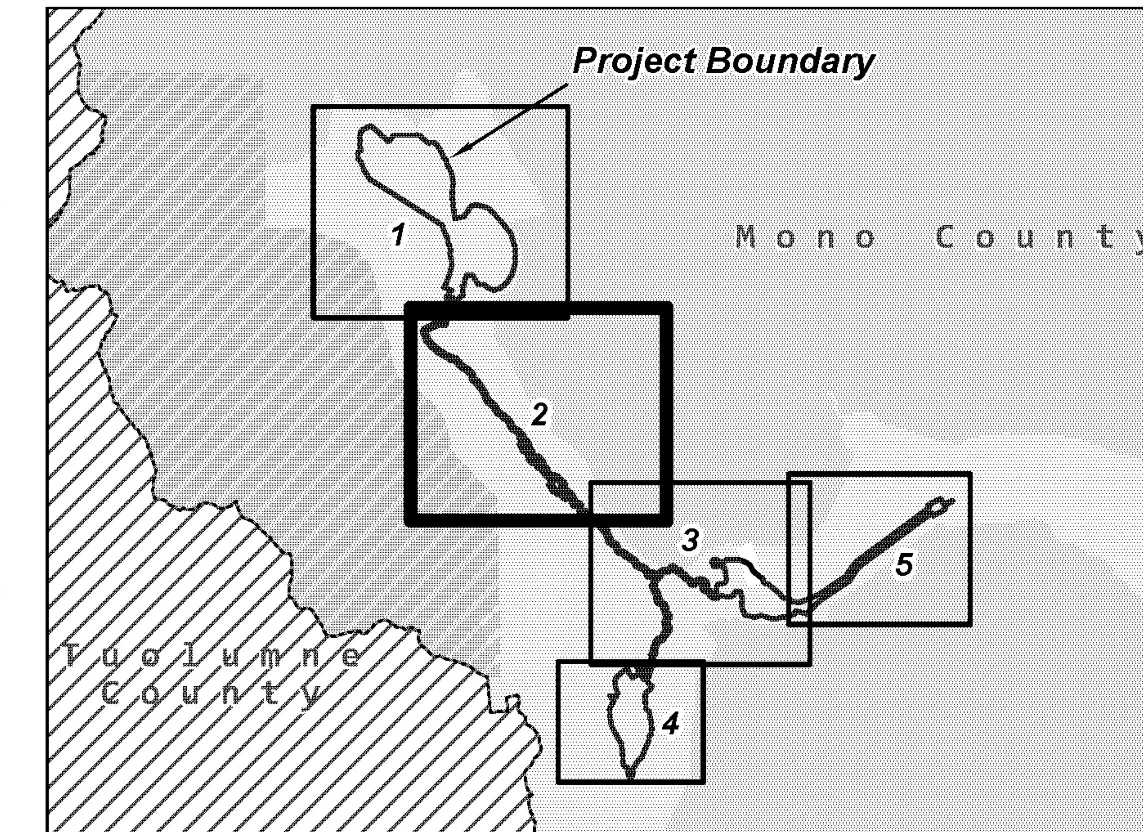
PROJECT BOUNDARY MAP

EXHIBIT G — SCALE: 1" = 350' — SHEET NO. 1 OF 5

0 280 550 1,100 1,700 2,200 Feet

DATE: APRIL 2024 — FERC NO. P-1388-





TN
MN
12.48°E
4/19/2024

- Project Boundary (Proposed)
- Project Boundary (Existing)
- Match Line
- Reference Point
- Project Facilities
- Project Stream Gage
- Hydrography
- Project Flowlines
- Poole Penstock
- Poole Tunnel
- Road
- Project Road
- PLSS Section
- SCE-Owned Land
- Inyo National Forest
- Wilderness Area
- Research Natural Area
- National Park
- County
- Transmission (Non-Project)
- USFS Trails
- USFS Recreation Site
- Campground
- Day Use Area
- Pullout
- Trailhead

Map notes:
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SOUTHERN CALIFORNIA EDISON

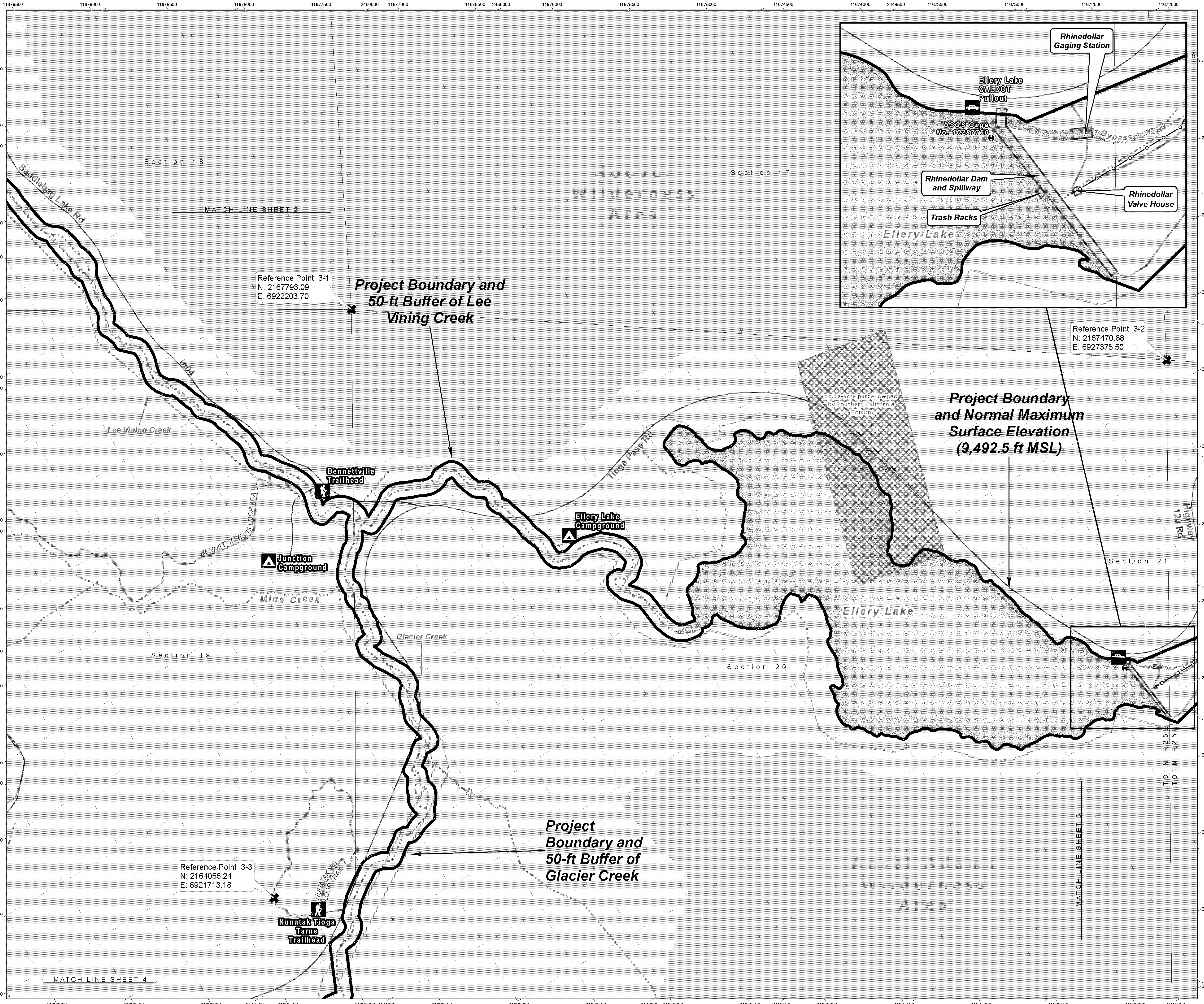
LEE VINING HYDROELECTRIC PROJECT
FERC NO. 1388

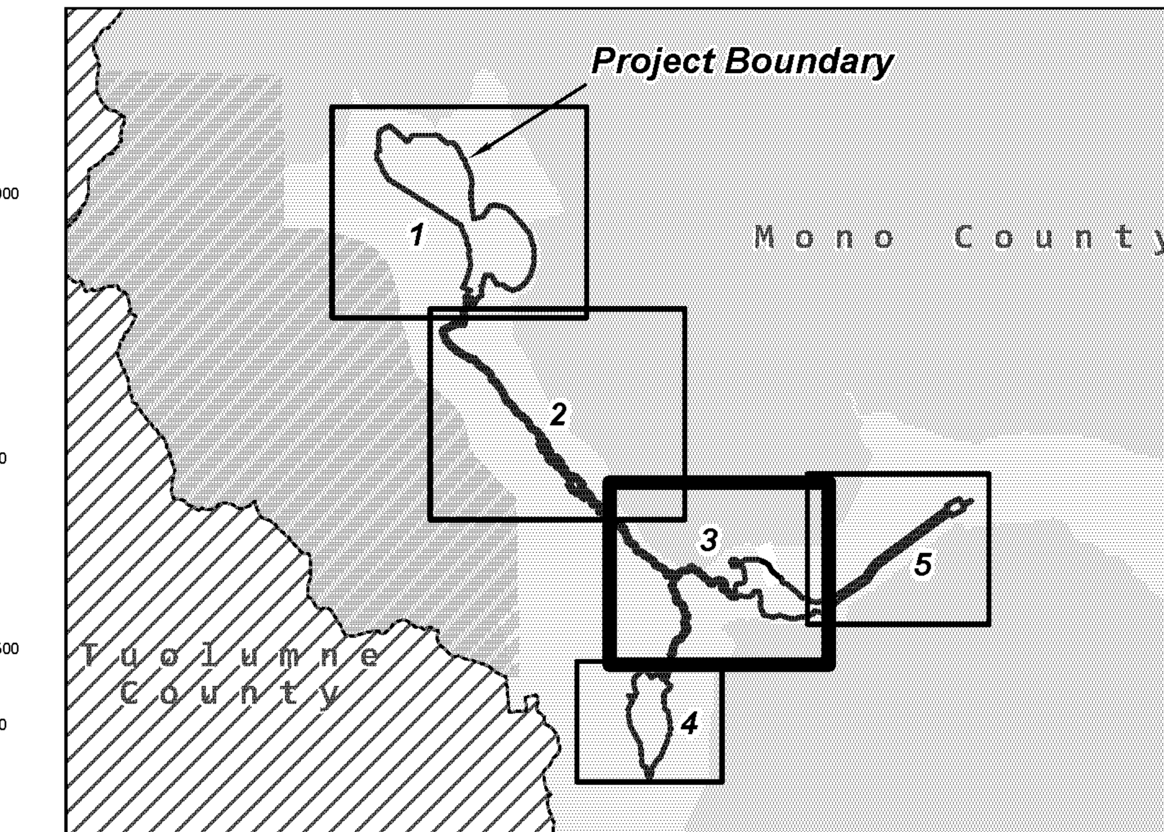
PROJECT BOUNDARY MAP

EXHIBIT G | SCALE: 1" = 350' | SHEET NO. 2 OF 5

0 280 550 1,100 1,700 2,200 Feet

DATE: APRIL 2024 | FERC NO. P-1388-





TN
MN
12.47°E
4/24/2024

- Project Boundary (Proposed)
- Project Boundary (Existing)
- Match Line
- Reference Point
- Project Facilities
- Project Stream Gage
- Hydrography
- Project Flowlines
- Poole Penstock
- Poole Tunnel
- Road
- Project Road
- PLSS Section
- SCE-Owned Land
- Inyo National Forest
- Wilderness Area
- Research Natural Area
- National Park
- County
- Transmission (Non-Project)
- USFS Trails
- USFS Recreation Site
- Campground
- Day Use Area
- Pullout
- Trailhead

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SOUTHERN CALIFORNIA EDISON

LEE VINING HYDROELECTRIC PROJECT
FERC NO. 1388

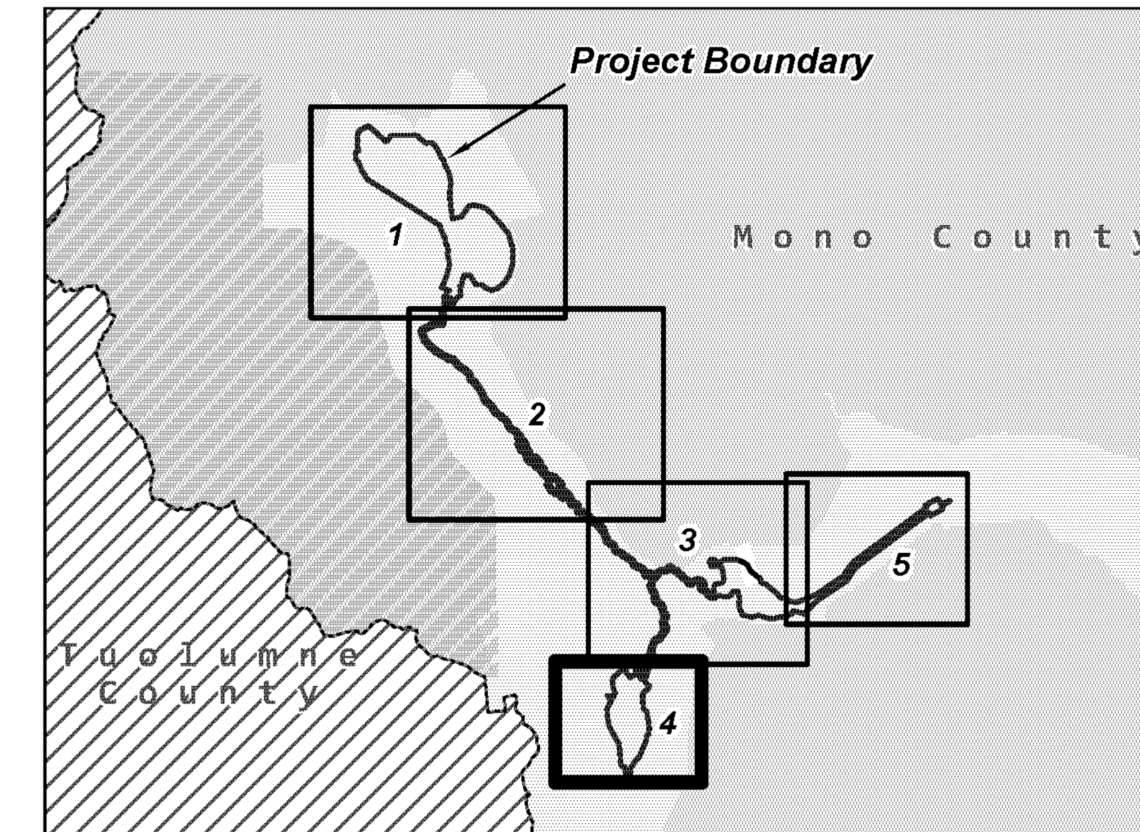
PROJECT BOUNDARY MAP

EXHIBIT G | SCALE: 1" = 300' | SHEET NO. 3 OF 5

0 240 470 940 1,400 1,900 Feet

DATE: APRIL 2024

FERC NO. P-1388-



TN MN
12.47°E
4/24/2024

- Project Boundary (Proposed)
- Project Boundary (Existing)
- Match Line
- Reference Point
- Project Facilities
- Project Stream Gage
- Hydrography
- Project Flowlines
- Poole Penstock
- Poole Tunnel
- Road
- Project Road
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- National Park
- County
- Transmission (Non-Project)
- USFS Trails
- USFS Recreation Site
- Campground
- Day Use Area
- Pullout
- Trailhead

Map notes:
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2. Reference Point coordinates are shown in NAD 1983 StatePlane California III FIPS 0403 Ft US.
3. Elevations shown are referenced to Mean Sea Level (MSL). As part of the endorheic basin of Mono Lake, the location of the Lee Vining Hydroelectric Project is not significantly affected by tidal influences, thus, MSL is equal to the National Geodetic Vertical Datum of 1929 (NGVD 29) at the Project's location.
4. Licensee has acquired all flowage rights and title in fee or the right to use in perpetuity all lands necessary or appropriate for the construction, maintenance, and operation of the Project. All property records are kept on file with the licensee.
5. The project encompasses 535.99 acres of federal lands managed by the United States Forest Service within the Inyo National Forest.
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SOUTHERN CALIFORNIA EDISON

LEE VINING HYDROELECTRIC PROJECT
FERC NO. 1388

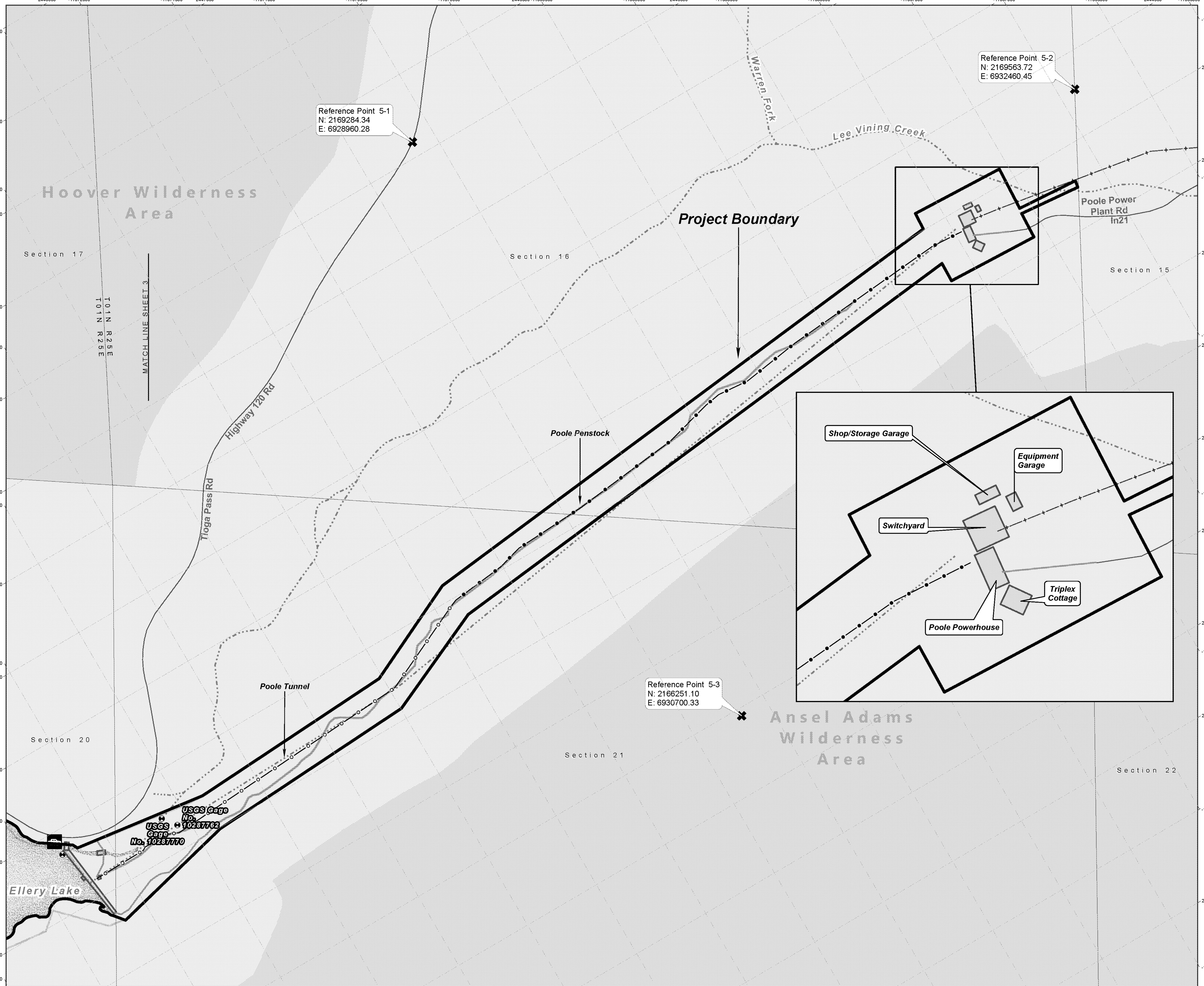
PROJECT BOUNDARY MAP

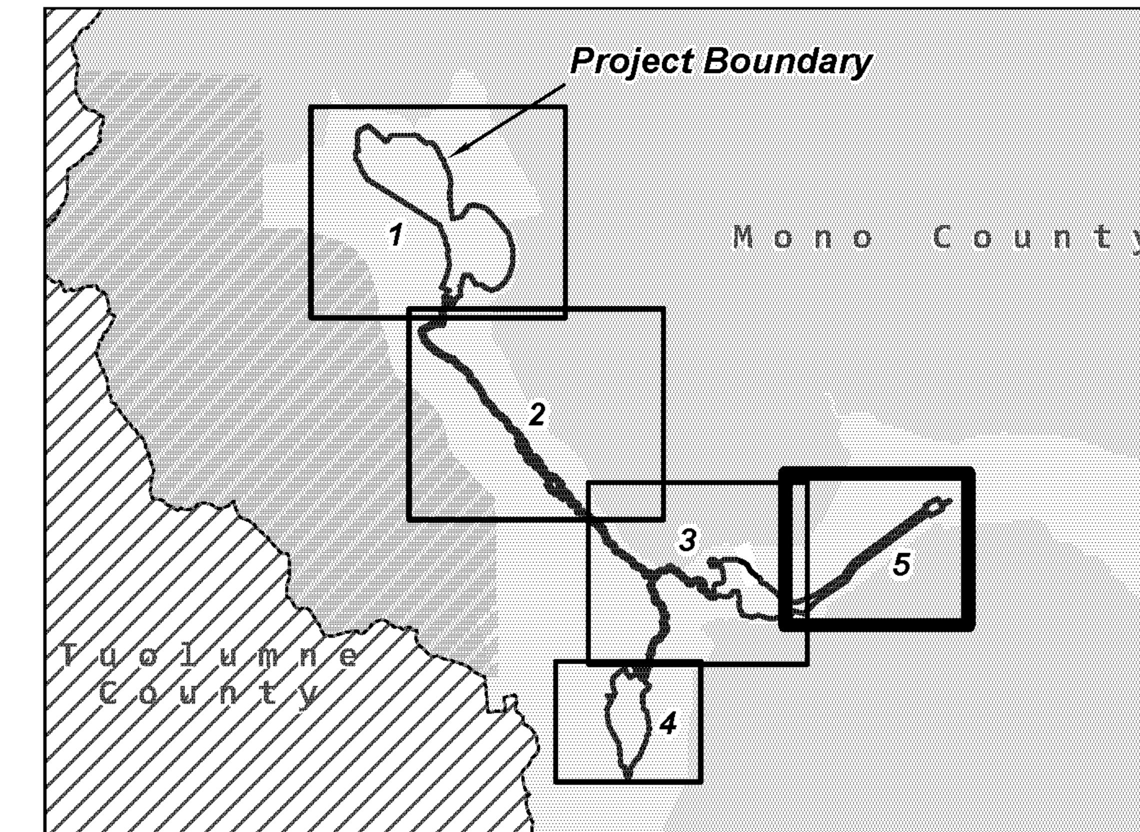
EXHIBIT G | SCALE: 1" = 200' | SHEET NO. 4 OF 5

0 160 310 620 930 1,200 Feet

DATE: APRIL 2024

FERC NO. P-1388-





TN
MN
12.46°E
4/24/2024

Project Boundary (Proposed)	Poole Tunnel	Transmission (Non-Project)
Project Boundary (Existing)	Road	USFS Trails
Match Line	Project Road	USFS Recreation Site
Reference Point	PLSS Section	Campground
Project Facilities	SCE-Owned Land	Day Use Area
Project Stream Gage	Inyo National Forest	Pullout
Hydrography	Wilderness Area	Trailhead
Project Flowlines	Research Natural Area	
Poole Penstock	National Park	
	County	

Map notes:
1. The Lee Vining Project is located in the State of California in Mono County.
2. Reference Point coordinates are shown in NAD 1983 StatePlane California III FIPS 0403 Ft US.
3. Elevations shown are referenced to Mean Sea Level (MSL). As part of the endorheic basin of Mono Lake, the location of the Lee Vining Hydroelectric Project is not significantly affected by tidal influences, thus, MSL is equal to the National Geodetic Vertical Datum of 1929 (NGVD 29) at the Project's location.
4. Licensee has acquired all flowage rights and title in fee or the right to use in perpetuity all lands necessary or appropriate for the construction, maintenance, and operation of the Project. All property records are kept on file with the licensee.
5. The project encompasses 535.99 acres of federal lands managed by the United States Forest Service within the Inyo National Forest.
6. The Project boundary description, as required by 18 CFR 4.41, is represented here by a grid of Northings and Eastings around, and graticules within, the map frame. Any position in Northings and Eastings along the Project boundary can be determined using these references.
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The Surveyor Stamp will be added to this Exhibit G subsequent to FERC approval of the Proposed Lee Vining Project Boundary

SOUTHERN CALIFORNIA EDISON

LEE VINING HYDROELECTRIC PROJECT
FERC NO. 1388

PROJECT BOUNDARY MAP

EXHIBIT G | SCALE: 1" = 250' | SHEET NO. 5 OF 5

0 200 390 780 1,200 1,600 Feet

DATE: APRIL 2024 | FERC NO. P-1388-

SOUTHERN CALIFORNIA EDISON

LEE VINING HYDROELECTRIC PROJECT

(FERC PROJECT NO. 1388)

EXHIBIT H

DRAFT LICENSE APPLICATION

SOUTHERN CALIFORNIA EDISON®
Energy for What's Ahead℠

September 2024

SOUTHERN CALIFORNIA EDISON

Lee Vining Hydroelectric Project
(FERC Project No. 1388)

Draft License Application
EXHIBIT H: Description of Project Management and Need for Project Power

Southern California Edison
2244 Walnut Grove Avenue
Rosemead, CA 91770

September 2024

Support from:

Kleinschmidt

Exhibit H: Description of Project Management and Need for Project Power

Title 18 of the Code of Federal Regulations, Section 4.51 describes information that an applicant for a new license (License for Major Project—Existing Dam) must include in Exhibit H of its license application.

The information required to be provided by this exhibit must be included in the application as a separate exhibit labeled "Exhibit H."

(1) *Information to be provided by an applicant for new license: Filing requirements*

(i) *Information to be supplied by all applicants.* All Applicants for a new license under this part must file the following information with the Commission:

(A) A discussion of the plans and ability of the applicant to operate and maintain the project in a manner most likely to provide efficient and reliable electric service, including efforts and plans to:

(1) Increase capacity or generation at the project;

(2) Coordinate the operation of the project with any upstream or downstream water resource projects; and;

(3) Coordinate the operation of the project with the applicant's or other electrical systems to minimize the cost of production.

(B) A discussion of the need of the applicant over the short and long term for the electricity generated by the project, including:

(1) The reasonable costs and reasonable availability of alternative sources of power that would be needed by the applicant or its customers, including wholesale customers, if the applicant is not granted a license for the project;

(2) A discussion of the increase in fuel, capital, and any other costs that would be incurred by the applicant or its customers to purchase or generate power necessary to replace the output of the licensed project, if the applicant is not granted a license for the project;

(3) The effect of each alternative source of power on:

(i) The applicant's customers, including wholesale customers;

(ii) The applicant's operating and load characteristics; and

(iii) The communities served or to be served, including any reallocation of costs associated with the transfer of a license from the existing licensee.

(C) The following data showing need and the reasonable cost and availability of alternative sources of power:

(1) The average annual cost of the power produced by the project, including the basis for that calculation;

(2) The projected resources required by the applicant to meet the applicant's capacity and energy requirements over the short and long term including:

(i) Energy and capacity resources, including the contributions from the applicant's generation, purchases, and load modification measures (such as conservation, if considered as a resource), as separate components of the total resources required;

(ii) A resource analysis, including a statement of system reserve margins to be maintained for energy and capacity; and

(iii) If load management measures are not viewed as resources, the effects of such measures on the projected capacity and energy requirements indicated separately;

(iv) For alternative sources of power, including generation of additional power at existing facilities, restarting deactivated units, the purchase of power off-system, the construction or purchase and operation of a new power plant, and load management measures such as conservation: The total annual cost of each alternative source of power to replace project power; the basis for the determination of projected annual cost; and a discussion of the relative merits of each alternative, including the issues of the period of availability and dependability of purchased power, average life of alternatives, relative equivalent availability of generating alternatives, and relative impacts on the applicant's power system reliability and other system operating characteristics; and the effect on the direct providers (and their immediate customers) of alternate sources of power.

(D) If an applicant uses power for its own industrial facility and related operations, the effect of obtaining or losing electricity from the project on the operation and efficiency of such facility or related operations, its workers, and the related community.

(E) If an applicant is an Indian tribe applying for a license for a project located on the tribal reservation, a statement of the need of such Indian tribe for electricity generated by the project to foster the purposes of the reservation.

(F) A comparison of the impact on the operations and planning of the applicant's transmission system of receiving or not receiving the project license, including:

(1) An analysis of the effects of any resulting redistribution of power flows on line loading (with respect to applicable thermal, voltage, or stability limits), line losses, and necessary new construction of transmission facilities or upgrading of existing facilities, together with the cost impact of these effects;

(2) An analysis of the advantages that the applicant's transmission system would provide in the distribution of the project's power; and

(3) Detailed single-line diagrams, including existing system facilities identified by name and circuit number, that show system transmission elements in relation to the project and other principal interconnected system elements. Power flow and loss data that represent system operating conditions may be appended if applicants believe such data would be useful to show that the operating impacts described would be beneficial.

(G) If the applicant has plans to modify existing project facilities or operations, a statement of the need for, or usefulness of, the modifications, including at least a reconnaissance-level study of the effect and projected costs of the proposed plans and any alternate plans, which in conjunction with other developments in the area would conform with a comprehensive plan for improving or developing the waterway and for other beneficial public uses as defined in Section 10(a)(1) of the Federal Power Act.

(H) If the applicant has no plans to modify existing project facilities or operations, at least a reconnaissance-level study to show that the project facilities or operations in conjunction with other developments in the area would conform with a comprehensive plan for improving or developing the waterway and for other beneficial public uses as defined in Section 10(a) (1) of the Federal Power Act.

(I) A statement describing the applicant's financial and personnel resources to meet its obligations under a new license, including specific information to demonstrate that the applicant's personnel are adequate in number and training to operate and maintain the project in accordance with the provisions of the license.

(J) If an applicant proposes to expand the project to encompass additional lands, a statement that the applicant has notified, by certified mail, property owners on the additional lands to be encompassed by the project and governmental agencies and subdivisions likely to be interested in or affected by the proposed expansion.

(K) The applicant's electricity consumption efficiency improvement program, as defined under Section 10(a)(2)(C) of the Federal Power Act, including:

(1) A statement of the applicant's record of encouraging or assisting its customers to conserve electricity and a description of its plans and capabilities for promoting electricity conservation by its customers; and

(2) A statement describing the compliance of the applicant's energy conservation programs with any applicable regulatory requirements.

(L) The names and mailing addresses of every Indian tribe with land on which any part of the proposed project would be located or which the applicant reasonably believes would otherwise be affected by the proposed project.

(ii) *Information to be provided by an applicant licensee.* An existing licensee that applies for a new license must provide:

(A) The information specified in paragraph (c)(1) of this section.

(B) A statement of measures taken or planned by the licensee to ensure safe management, operation, and maintenance of the project, including:

(1) A description of existing and planned operation of the project during flood conditions;

(2) A discussion of any warning devices used to ensure downstream public safety;

(3) A discussion of any proposed changes to the operation of the project or downstream development that might affect the existing Emergency Action Plan, as described in subpart C of part 12 of this chapter, on file with the Commission;

(4) A description of existing and planned monitoring devices to detect structural movement or stress, seepage, uplift, equipment failure, or water conduit failure, including a description of the maintenance and monitoring programs used or planned in conjunction with the devices; and

(5) A discussion of the project's employee safety and public safety record, including the number of lost-time accidents involving employees and the record of injury or death to the public within the project boundary.

(C) A description of the current operation of the project, including any constraints that might affect the manner in which the project is operated.

(D) A discussion of the history of the project and record of programs to upgrade the operation and maintenance of the project.

(E) A summary of any generation lost at the project over the last five years because of unscheduled outages, including the cause, duration, and corrective action taken.

(F) A discussion of the licensee's record of compliance with the terms and conditions of the existing license, including a list of all incidents of noncompliance, their disposition, and any documentation relating to each incident.

(G) A discussion of any actions taken by the existing licensee related to the project which affect the public.

(H) A summary of the ownership and operating expenses that would be reduced if the project license were transferred from the existing licensee.

(I) A statement of annual fees paid under part I of the Federal Power Act for the use of any Federal or Indian lands included within the project boundary.

(iii) *Information to be provided by an applicant who is not an existing licensee.* An applicant that is not an existing licensee must provide:

(A) The information specified in paragraph (c)(1) of this section.

(B) A statement of the applicant's plans to manage, operate, and maintain the project safely, including:

(1) A description of the differences between the operation and maintenance procedures planned by the applicant and the operation and maintenance procedures of the existing licensee;

(2) A discussion of any measures proposed by the applicant to implement the existing licensee's Emergency Action Plan, as described in subpart C of part 12 of this chapter, and any proposed changes;

(3) A description of the applicant's plans to continue safety monitoring of existing project instrumentation and any proposed changes; and

(4) A statement indicating whether or not the applicant is requesting the licensee to provide transmission services under section 15(d) of the Federal Power Act.

(1) <u>Information to be Provided by an Applicant for New License: Filing Requirements</u>

(i) Information to be supplied by all applicants. All applicants for a new license under this part must file the following information with the Commission.

(A) Efficiency and Reliability

Southern California Edison Company (SCE) has extensive experience operating and maintaining its vast hydroelectric systems efficiently and reliably. SCE is responsible for generating, purchasing, transmitting, and distributing electricity to its customers. The Lee Vining Hydroelectric Project (Project), Federal Energy Regulatory Commission (FERC) Project No. 1388, is operated in conjunction with SCE's other generating resources to meet the electricity demand of its customers throughout the state.

(1) <u>Increase Capacity or Generation at the Project</u>

SCE is not proposing any changes to the capacity or generation of the Project.

(2) <u>Coordinate the Operation of the Project with any Upstream or Downstream Water Resources Projects</u>

The Project is the uppermost water resource project for Lee Vining Creek Drainage; there are no other upstream projects. Saddlebag, Tioga, and Ellery Lakes are the principal storage reservoirs that supply water to the Project and downstream users.

SCE stores water from the drainage area in the Project's reservoirs and releases the water for power generation, which is the primary, non-consumptive use of water within the Lee Vining Creek watershed. Downstream of the Project, the Los Angeles Department of Water and Power owns and operates their diversion dam on Lee Vining Creek. Project operations must be consistent with the 1933 Sales Agreement between the Southern Sierras Power Company (predecessor to SCE) and the Los Angeles Department of Water and Power. The Project also conforms to the minimum flow release requirements outlined in the FERC license. SCE will continue to operate the Project in the future as it has in the past. As described below, once water has left the FERC Project Boundary, SCE has no control over downstream diversions.

While meeting the Los Angeles Department of Water and Power Sales Agreement targets and the required FERC minimum flows, SCE also optimizes powerhouse generation to meet load requests from the California Independent System Operator (CAISO). This process of delivering intraday load to satisfy demands is known as “Hydro-resource Optimization.” The Poole Powerhouse is typically activated during peak hours in response to grid demand. This operation leads to the release of flow into Lee Vining Creek below the Poole Powerhouse, generally lasting less than 8 hours.

(3) Coordinate the Operation of the Project with the Other Electrical Systems to Minimize the Cost of Production

The entire set of SCE generation facilities is coordinated through the SCE Energy Control Center to maximize generation while minimizing economic and environmental costs. SCE bids power from its retained generation facilities into markets governed by the CAISO. Thus, electrical generation from the Project is coordinated with other generation throughout California.

(B) Need for Electricity Generated by the Project

The Poole Powerhouse is used to respond to California Public Utility Commission (CPUC) and CAISO demands for power. Demands can be market driven (i.e., energy needs and renewable load) or can be in response to a need for grid and electrical stability in Mono Basin when the source transmission line is de-energized (115-kilovolt Rush Creek–Casa Diablo line). The line can be de-energized to protect public safety, because of 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 CAISO greater grid. Should the Casa Diablo line be de-energized, the Poole 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.

With the Poole Powerhouse and Casa Diablo line operational, there is enough generation and capacity in the lines during off-peak and peak conditions to feed load in the area. If a new license is not issued and the Poole Powerhouse is no longer generating electricity, SCE would have approximately 2,152 customers without power each time the Casa Diablo line is de-energized. Absent the Poole Powerhouse to serve as backup to the Casa Diablo line, there could be significant effects on customers.

(1) Costs and Availability of Alternative Sources of Power

California has very aggressive decarbonization goals (90 percent carbon-free power by 2035 and 100 percent carbon-free power by 2045) and is adding a variety of zero-carbon resources to meet both clean energy goals and increase reliability as electricity consumption has increased. Without this Project, equivalent new generation facilities would need to be built to meet these goals and targets. This Project provides energy, reliability capacity, and zero-carbon electricity. While the production of the facility varies by season and water year type, the daily production profile is consistent and does not depend on momentary weather patterns, as with wind and solar resources. The closest substitute for the Project would be another hydroelectric facility or new geothermal facility. The latest CAISO 20-Year Transmission Outlook includes the need for 5,000 megawatts (MW) of new, incremental clean firm[1], resources and the loss of facilities like the Project could add to this incremental need (CAISO, 2024). A good reference for such costs is California's annual *Padilla Report* on costs of the Renewables Portfolio Standard Program (CPUC, 2024). Figure 5 of the 2024 report shows new geothermal and hydro at around $95 per megawatt hour (MWh) (CPUC, 2024).

(2) Increase in Fuel, Capital, and Other Costs

Since the Project would need to be replaced with a clean energy resource that meets California's carbon-neutrality goals and is Renewables Portfolio Standard eligible, there would likely not be an increase in fuel consumption. Another entity in California would need to build a new substitute facility at the costs referenced above in Section (i)(B)(1).

(3) Effects of Alternative Sources of Power

As covered in Section (i)(B)(1), the Project would need to be replaced by an equivalent zero-carbon resource and as such would incur the cost of that new facility and the likely consumption of greenfield for the new facility.

i Customers, Including Wholesale Customers

Alternative sources or power would have incremental costs to customers for the replacement of firm zero-

[1] Firm sources of power can generate 24 hours per day, 7 days per week, when needed.

emitting resources. As stated in Section (i)(B)(1) above, the *Padilla Report* puts these costs at around $95 per MWh.

ii Operating and Load Characteristics

Alternative clean firm sources of power would have negligible effects on operating and load characteristics.

Communities Served or to be Served

Alternative sources of clean firm power would come at additional cost, and such new facilities may have local environmental effects in other communities.

(C) Need, Reasonable Cost, and Availability of Alternative Sources of Power

(1) <u>Average Annual Cost of Power Produced by the Project</u>

The Project has an installed capacity of 11.25 MW and a dependable capacity of 10.9 MW. Under current operations (1997 to 2022), average annual generation was 26,411 MWh. During that same period, annual generation ranged from 7,873 MWh to 46,846 MWh.

According to the United States Energy Information Administration, the average annual amount of electricity sold to (purchased by) residential electricity customers in 2022 was 10,791 kilowatt hours (USEIA, 2022). Based on this figure, the Project provides enough electricity to supply 1,967 households. According to the latest United States Census Bureau data, there are 5,473 households in Mono County. Thus, production at the Project is enough to provide electric service to approximately 36 percent of the households in Mono County. Energy generated by the Project is important both locally and regionally.

The Project's net investment as of 2023 was approximately $14,584,424 and the direct operation and maintenance expenses (based on the 5-year average from 2019 to 2023) was $1,178,146. Additional Project operating expenses and capital costs are discussed in Exhibit D, *Project Cost and Financing*.

(2) The Projected Resources Required by SCE to Meet Capacity and Energy Requirements

i Energy and Capacity Resources as Separate Components of Total Resources Required

In 2023, the SCE system had a 12.6-gigawatt capacity procurement requirement and a 51.4 terawatt-hour energy procurement requirement. Of the 12.6-gigawatt capacity procurement requirement, 9.36 MW was due to the required planning reserve margin.

The Project provided a “net qualifying capacity” of 1.82 MW during the 2023 peak in August 2023. The actual capacity and energy requirement were met by a variety of resources.

ii Resource Analysis and System Reserve Margins

California maintains a minimum 15 to 17 percent capacity planning reserve margin. SCE meets its capacity and energy requirements through a relatively small “Utility Owned” portfolio, and the rest of the need is filled through various procurement processes, including demand response and energy efficiency procurement. Of the power delivered to customers in 2022, 33.2 percent was from eligible renewables, 3.4 percent large hydro, 27.4 percent natural gas, 8.3 percent nuclear, and 30.4 percent from unspecified market transactions (CAEC, 2024). Over the term of the new license, some of these sources of power will be phased out to meet California’s carbon-neutrality goals by 2045.

iii Effects of Efficiency and Load Management Measures

SCE has a robust demand response, energy efficiency, and customer self-generation programs. Some of these programs are “load modifiers” and others are supply resources.

iv Cost and Merits of Project Alternatives

Energy generated by the Project displaces energy that would otherwise be generated by gas-fired units in the short-term and reduces the need for new clean, firm resources in the longer-term. Currently, aside from power generated by its own sources, SCE purchases the power needed to serve its customers from qualifying facilities, independent power producers, CAISO, the California Department of Water Resources (under contracts with other third parties), and other utilities. If the Project were to cease operations, new, incremental clean firm resources would need to be built to replace the characteristics of the Project.

(D) Effect on Industrial Facilities

SCE does not use the power associated with the Project for its own industrial facility or related operations, except for local operational support (e.g., station light and power at Poole Powerhouse).

(E) Tribal Need for the Project on a Reservation

SCE is not a Tribe nor is the Project on a Tribal reservation.

(F) Effect on Transmission System

(1) Redistributing Power Flows and Cost Impacts

There are no transmission lines within SCE's transmission system that are regulated under the Project license. However, a 6.4-mile-long, 115-kilovolt transmission line conveys power from Poole Powerhouse to the Lee Vining Substation. This transmission line was removed from the FERC Project Boundary and license in 2001.

SCE assessed the effect on the transmission system if a new license to operate the Project is not issued. As stated above, the only alternative source of power to the Project is the Casa Diablo transmission line. If a new license is not issued and the Poole Powerhouse is no longer generating electricity, SCE would have approximately 2,152 customers without power each time the Casa Diablo line is de-energized. Absent the Poole Powerhouse to serve as backup to the Casa Diablo line, there could be significant effects on the transmission system, SCE customers, and the communities of Lee Vining, Bridgeport, Mono City, and June Lake.

(2) Advantages of Transmission System

As stated above, there are no transmission lines within SCE's transmission system that are regulated under the Project's license. However, SCE's interconnection with the broader transmission system provides additional reliability as a source of power for local SCE customers in the event that the Casa Diablo line is not in service.

(3) Single-Line Diagrams

A single-line diagram of the Project showing system transmission (not regulated under the Project) is considered Critical Energy Infrastructure Information (CEII) under FERC's CEII regulations at 18 CFR § 388.113. This document will be filed as CEII in Volume IV of this Draft License Application, and SCE will request that FERC maintain in a non-public file and withheld from public disclosure per applicable regulations.

(G) Statement of the Need for Modifications

SCE has no plans at this time to modify existing facilities or operations that would affect conformance with compliance plans.

(H) Statement of Conformance If No Modifications Are Proposed

The Project would conform with comprehensive plans for improving or developing the waterway and for other beneficial public uses as defined in Section 10(a)(1) of the FPA. Reviews of existing plans to ensure consistency are found in Exhibit E, *Environmental Report*, of this application.

Project facilities and operations, including mitigation measures proposed in Exhibit E, are best adapted to a comprehensive plan for Lee Vining Creek based on a balance among environmental protection, water supply, recreation, and the commerce and utilization of a low-cost, non-polluting source of energy. The Project, as proposed in this application for a new license, accounts for all existing and potential uses of Lee Vining Creek, including recreation, economically viable hydroelectric generation, energy conservation in the context of the national interest in non-polluting and non-fossil fuel alternatives, public safety, and various aspects of environmental protection, including the prevention of significant detrimental effects to fish and wildlife resources.

Identification and review of the potentially relevant comprehensive plans indicate that relicensing of the Project would not conflict with the goals or objectives of any such plans. The Project adopts measures to ensure public safety, protect the environment, enhance recreation opportunities, and operate for maximum efficiency and reliability, and thus provide the best possible overall mix of benefits.

(I) Financial and Personnel Resources

SCE's source and extent of financing and annual revenues are sufficient to meet the continuing operation and maintenance needs of the Project. For specific financial information, refer to FERC Form No. 1, which is provided to FERC annually.

SCE has personnel resources necessary to meet license obligations for the Project. A variety of training resources and approaches are used, including classroom training, workshops, textbooks, on-the-job training, web-based training, and safety training for all personnel. Safety training is conducted through a combination of regularly scheduled monthly meetings, crew meetings, on-the-job training, and special programs, as needed. The training covers SCE's Occupational Safety, Health, and Fire Prevention rules and hazardous materials handling, as well as programs mandated by governmental agencies such as the California Occupational Safety and Health Division, FERC standards of conduct, training related to compliance with FERC license articles, and environmental and cultural protection programs. Many of these compliance training courses are provided annually.

Job knowledge and skills training programs are available for management, supervisor/administrative, clerical, and craft employees, with apprenticeship training programs established for selected job classifications. Individual training needs are evaluated continually, and employees are subsequently scheduled into existing programs offered within SCE or into appropriate outside training programs.

Employees are also encouraged to further their education through the educational assistance program, which provides financial assistance for eligible employees who participate in job-related courses, correspondence programs, and degree and/or certificate programs sponsored by accredited institutions.

(J) Notification of Proposed Expansion of Project Lands

Minor changes to the existing FERC Project Boundary are being proposed to address inaccuracies, accommodate lands necessary for protection, mitigation, and enhancement measures, and to better reflect how operation and maintenance (O&M) is managed around Project facilities. These changes have been discussed with the U.S. Forest Service (USFS), the only landowner affected. Changes are reflected in Exhibit G, *Project Maps*, of this License Application.

(K) Electricity Consumption Efficiency Improvement Program

(1) Energy and Electrical Conservation

SCE is actively engaged in energy efficiency, conservation, and environmentally beneficial programs.

Successful program offerings include customer incentives, online tools, information and education, and cooperative effort with third-party contractors and other utilities. The CPUC ordered the California Investor-Owned Utilities to procure energy efficiency programs that are designed and implemented by third parties. As a result, each Investor-Owned Utility entered contracts with certain vendors, who were selected through competitive solicitation processes. Additionally, customers now receive energy efficiency services, products, compensation, and/or installation directly or indirectly from these third parties. Example programs include Instant Rebates, Comfortably California, Illuminate California, Statewide Midstream Water Heating Program, and Willdan Energy Efficiency Programs targeting commercial, industrial, and multi-family customers.

SCE's website describes a variety of products to help customers manage energy use via the web, mobile app, and/or sensors. A suite of online tools gives customers the ability to track energy costs and analyze usage. In addition, other information is disseminated to customers and energy classes and workshops are offered at Energy Education Centers in Irwindale and Tulare, California. Detailed information regarding energy efficiency and conservation programs is provided on SCE's website at www.sce.com.

(2) Compliance of Energy Conservation Programs

Regulatory compliance and reporting of SCE's energy efficiency programs is tracked through collection, reporting, and verification of information on the programs' performance. The results of the performance of the programs are filed annually with the CPUC.

(L) Indian Tribe Names and Mailing Addresses

The following Indian Tribal contacts are believed by SCE to potentially have an interest in the Project, although no Project facilities are located on any Tribal lands. Federally recognized Tribes were contacted by FERC on October 8, 2021, following the filing of the Pre-Application Document. A Cultural and Tribal Technical

Working Group was created for those (federally and non-federally recognized) Tribes wishing to stay involved in the privileged and confidential information associated with the Cultural and Tribal studies conducted as part of this relicensing effort.

American Indian Council of Mariposa County
P.O. Box 186
Mariposa, CA 95338

Antelope Valley Indian Community, Coville Paiute Tribe
P.O. Box 47
Coleville, CA 96107

Big Pine Paiute Tribe of Owens Valley
P.O. Box 700
Big Pine, CA 93513

Bishop Paiute Tribe
50 Tu Su Lane
Bishop, CA 93514

Bridgeport Paiute Indian Colony
P.O. Box 37
Bridgeport, CA 93517

Fort Independence Indian Community of Paiute Indians
P.O. Box 67
Independence, CA 93526

Lone Pine Paiute-Shoshone Tribe
P.O. Box 747
Lone Pine, CA 93545

Mono Lake Kutzadikaa Tribe
P.O. Box 117
Big Pine, CA 93513

North Fork Mono Tribe of California
13396 Tollhouse Road
Clovis, CA 93619

North Fork Rancheria of Mono Indians
P.O. Box 929
North Fork, CA 93643

Timbisha Shoshone Tribe
621 W Line St., Suite 109
Bishop, CA 93514

Tuolumne Band of Me-Wuk Indians of the Tuolumne Rancheria of California
P.O. Box 669
Tuolumne, CA 95379

Utu Gwaitu Paiute Tribe of the Benton Paiute Reservation
25669 Highway 6
Benton, CA 93512

Walker River Paiute Tribe
P.O. Box 220
Schurz, NV 89427

Washoe Tribe of Nevada and California
919 U.S. Highway 395 N
Gardnerville, NV 89410

Yerington Paiute Tribe of the Yerington Colony and Campbell Ranch
171 Campbell Lane
Yerington, NV 89447

Yosemite-Mono Lake Paiute Indian Community
P.O. Box 157
Lee Vining, CA 93541

(ii) Information to be provided by an applicant licensee. An existing licensee that applies for a new license must provide:

(A) Information Specified in Paragraph (c)(1) of This Section.

As required by 18 CFR § 5.18(c)(1)(ii)(A), this Exhibit H contains the information specified in 18 CFR § 5.18(c)(1). This information appears in Section (1)(i) of this Exhibit H.

(B) Safe Management, Operation, and Maintenance

The Project stores water in Saddlebag, Tioga, and Ellery Lakes and each dam is classified as a high hazard dam by FERC, requiring Part 12 inspections every 5 years. Part 12 inspections are conducted by the FERC San Francisco Regional Office. SCE implements various measures to ensure safe management and O&M at the Project during all operating conditions. These measures are described in detail below. SCE completes all necessary corrective actions to address comments and recommendations arising from FERC inspections in a timely manner.

(1) <u>Operation During Flood Conditions</u>

To ensure safe management and O&M of the Project during flood and high-flow events,[2] Station Order Binders are maintained for each power plant. This document includes individual site-specific plans (Station Orders) outlining actions and considerations for high water flow events at each station and/or its associated head and tail works. The Station Order Binder provides for contingency planning and response to both planned and unplanned Project high-flow events.

During periods of high flow, various measures are implemented to prevent water damage to infrastructure and equipment, including:

- Low level outlets are opened;
- Powerhouse is operated at maximum hydraulic capacity (all units at full load) to minimize flooding;
- Areas at SCE facilities prone to flooding are sand bagged;

[2] A high-flow event is triggered in the Lee Vining system when flow rates reach the following cubic feet per second (cfs): Rhinedollar Dam—equal or greater than 300 cfs; Tioga Dam—equal or greater than 200 cfs; Saddlebag Dam—equal or greater than 200 cfs.

- Storm doors at SCE facilities are closed; and
- Sump pumps at SCE facilities are checked/installed.

(2) Warning Devices for Downstream Safety

The Project is classified as a “high hazard.” Public safety measures for the Project are listed in the Public Safety Plans. The Public Safety Plans are reviewed every spring, prior to the recreation season. If updates are needed, the plans are filed with FERC by the end of the calendar year. The public safety measures include:

- Warning signs located above and around the dams and powerhouse to notify the public of hazards, such as a “water release” warning sign at Rhinedollar Dam.
- Physical restraining devices to restrict public access to potentially hazardous areas (e.g., locked doors, fences around the switchyard, gates limiting access onto Project facilities, grates and debris catchers on intake structures).
- Safety measures at the dams, such as pedestrian bridges, handrails, boat barriers at Rhinedollar Dam and Tioga Dam; a life ring at Saddlebag Dam; and steel beams at the Rhinedollar Dam footbridge used as supports.
- SCE participates in National Dam Safety Awareness Day to promote public awareness of dam safety and the risks associated with living and recreating near dams.
- SCE coordinates with the Inyo County Office of Emergency Services and Mono County Office of Emergency Services to notify the public (residents, recreationists, and businesses as applicable), who could potentially be effected by a dam failure, with public safety advisory letters and public/educational meetings when deemed necessary. Additionally, SCE communicates public safety advisory flyers to land management agencies with recreation facilities, which may be effected by dam safety emergency events, for posting and distribution annually.

(3) Changes Affecting the Emergency Action Plan

FERC requires licensees to develop and file an Emergency Action Plan (EAP) with the Regional Engineer, unless granted a written exemption in accordance with §12.21(a) of the regulations. SCE maintains an up-to-date EAP for the Project. Staff training and drills are conducted annually. Tabletop and functional exercises are conducted on a 5-year schedule. The EAP is reviewed and updated annually (unless changes require a 30-day update) and is filed with FERC upon every update.

(4) Monitoring Devices

The Project includes the following instrumentation monitoring programs and devices to detect equipment failure including:

- Survey monuments at Saddlebag Dam
- Leakage weirs at Saddlebag Dam and Tioga Dam
- Headwater/tailwater gages at Saddlebag Dam and Tioga Dam
- Settlement and alignment deflection monuments (survey monuments) at Rhinedollar Dam and Tioga Dam
- Rate of change alarm on Rhinedollar Lake level gage
- Geomembrane inspection ports at Saddlebag Dam and Tioga Dam
- Seismic monitoring, based at Gem Lake (17 miles away)
- Geomembrane liner drains
- Crack monitoring
- Dam face discoloration/seepage monitoring
- Flow differential monitoring
- Line protection monitoring

Operators are dispatched to investigate and respond to alarms, as needed. SCE inspects all monitoring devices as part of routine O&M activities. If issues are identified, they are corrected as soon as discovered to ensure safe and reliable operation.

(5) Employee and Public Safety Record

There were no lost-time accidents involving employees recorded at the Project within the last 10 years.

There are no known records of injury or death to the public within the FERC Project Boundary within the last 10 years.

(6) SCE Company-wide Environmental Programs

i Environmental Training Program

SCE has implemented several internal sustainability programs, including supporting low-effect development and sustainable landscaping programs, workplace recycling, and environmentally friendly supply chain practices (SCE, 2023a).

SCE provides access to environmental training for the public though its Energy Education Centers program. Trainings focus on energy management and efficiency technologies. For in-person instruction, courses and workshops are held at Energy Education Centers in Irwindale and Tulare. Online learning is also available. Lessons are open to the public and free to attend. The Irwindale Center features a full-scale, operational demonstration for an energy-saving home, which the public can visit (SCE, 2023b).

ii Transmission, Power, and Communication Line Maintenance Program

Pursuant to Appendix XI of SCE's Transmission Owner Tariff, SCE provides an annual report covering its Transmission Maintenance and Compliance Review (TMCR). The goal of the report is to provide public Stakeholders additional transparency regarding transmission capital expenditures. These expenditures are predominantly related to maintenance and regulatory compliance requirements to operate a safe and reliable transmission system. This work involves replacing aging infrastructure, repairing and maintaining equipment in accordance with compliance requirements, upgrading transmission facilities owned by others for which SCE has a contractual entitlement, mitigating the effect of wildfire, and securing its assets and facilities from seismic and security concerns.

Transmission projects reviewed by the CAISO pursuant to its tariff are not in scope for SCE's TMCR Stakeholder process. Other exemptions to the TMCR process include: (1) facilities or projects that require an in-service date less than 2 years after their need is identified; (2) facilities or projects that have less than 30 percent of their total individual capital costs included in SCE's wholesale transmission rate base and where FERC jurisdictional portion of the Project's estimated individual cost is less than $1 million; and (3) facilities or projects that address the physical security and cyber security needs of the transmission system.

SCE's TMCR process does not affect or restrict any Stakeholder's Section 206 rights or right to intervene and/or protest in any of SCE's regulatory proceedings, including SCE's transmission rate filings (SCE, 2020b).

(C) Current Operations and Constraints

The Project impounds water at three points: Saddlebag Lake, Tioga Lake, and Ellery Lake. SCE currently operates the Project under a 30-year license that was issued by FERC on February 4, 1997.

Project operation is dictated by water availability. Flows are regulated by the Sales Agreement, as discussed above in Section (i)(A)(2), *Coordinate the Operation of the Project with any Upstream or Downstream Water Resources Projects*. Operation is further constrained by minimum flow requirements below the dams and intakes, as described in Exhibit E of this License Application.

(D) Project History and Upgrades

The Project developments were constructed during the timeframes described in Table H-1.

Table H-1 Project Developments

Year	Developments Constructed
1921	Saddlebag Dam constructed
1924	Rhinedollar Dam constructed by Southern Sierras Power Company
1924	Poole Powerhouse construction completed and started operation
1928	Tioga Dam and Tioga Auxiliary Dam constructed by Cain Irrigation District
1957	A new Parshall measuring flume was built, about 150 feet below the Rhinedollar spillway

Since beginning operation, the Project has undergone the upgrades and modifications (not including routine maintenance) described in Table H-2.

Table H-2 Project Upgrades and Modifications

Year	Upgrade or Modification
1927	Rhinedollar Dam crest raised by approximately 7 feet.
1939	The timber structure at Tioga Dam was apparently dynamited by saboteurs, causing a leak of about 25 cfs. After the lake was dewatered, it was found that the explosion broke through all layers of the timber face in a concentrated area, but none of the vertical stringers were damaged, and the rockfill had locally settled about 3 inches. The dam was repaired and put back into service before winter of 1939.
1942 and 1943	Timber facing of the Saddlebag Dam spillway was replaced.
1951	A 30-inch-diameter riveted steel pipeline was installed to extend the existing Saddlebag Dam outlet pipe in the excavated channel downstream from the dam for a distance of 220 feet.
1953–1954	Several significant items were undertaken to improve Saddlebag Dam, including: a new concrete cutoff to bedrock, 3 feet of fill added to the crest of the dam, timber facing was removed and replaced with redwood timber, downstream face of rock fill was filled out and dressed, concrete intake box was repaired and equipped with new trash racks.
1954	A new trashrack was placed on the Rhinedollar Dam outlets.
1958	A rock training wall was built at the right side of the spillway channel just upstream of the flume to better channel the high flows which could partially flood over toward the toe of the dam.
1960	A 2-inch redwood shiplap facing was placed over most of the existing face of the Tioga Dam. No cover was added in the area around the outlet, since the existing facing was in good condition.
1961	Some projecting rocks just below the Rhinedollar spillway were blasted off to improve flow conditions in the spillway channel.
1968	90-degree V-notch weirs added downstream of Saddlebag Dam to measure leakage.
1970	SCE installed a remote-controlled operating mechanism to the center Rhinedollar spillgate.
1971	Additional fill was placed on the Saddlebag Dam crest to level and improve the access road across the dam. A lake level recorder was installed.
1973	Tioga Dam's redwood facing was sealed with Thompson's Seal Coat.
1975	The Tioga Dam valve house was added to protect the 25-inch gate valve downstream of the Main Dam. A metal hand railing was added at the upstream side of the crest of the Main Dam.
1982	A crack in Tioga Dam's main spillway concrete was repaired.
1984	[July 18, 1984] Heavy rain caused mud slides, washouts, and flooding throughout the Project Area.
1985	A leak in Saddlebag Dam was detected and repaired by filling a sinkhole with a mixture of bentonite and sand.
1986	Concrete was placed over the 1985 Saddlebag Dam sinkhole's bentonite plug located upstream of the dam.
1987	The generator was rebuilt increasing the output to 11.25 MW.
1987	A 90-degree V-notch weir (Weir No. 4) was installed to measure general seepage at the right downstream side of Saddlebag Dam.

Year	Upgrade or Modification
1989	At Saddlebag Dam, additional concrete was placed at the right abutment, and timber was extended at the crest at the left abutment to contain the predicated probable maximum flood flows.
1996–2012	At Tioga Dam, maintenance has included the following: erosion repairs on main dam crest; replacement of redwood facing, annual sealing of redwood facing, repairs of spillway concrete, concrete on right abutment of main dam repairs.
1998	Radial gates at Rhinedollar Dam were removed.
1998	A 1.5-foot-high concrete parapet wall was added at the upstream crest of Rhinedollar Dam.
1999	Weir No. 5 was installed at Saddlebag Dam to measure seepage next to the valve house.
2006	A new trashrack grid and steel access platform were installed at Rhinedollar Dam.
2011	Construction activities were undertaken at Saddlebag Dam to address increases in downstream seepage: a geomembrane liner was placed over upstream face of the dam; the sinkhole area from 1985 was excavated down to bedrock and bentonite pellets were placed into an open fracture, concrete was added on top, and native material added; concrete plinth was inspected (good condition); and the left abutment was evaluated for potential liquefaction.
2012	A French Drain was constructed at Tioga Dam adjacent to the gatehouse to collect seepage from behind and around the gatehouse and direct it to a pipe, where volumetric measurements of the seepage can be made.
2013	Saddlebag Dam's spillway redwood planking was removed and replaced with reinforced concrete. The concrete apron was extended to approximately 25 feet and riprap was added at the downstream end of the spillway. The spillway crest was also lowered by one foot. The 12-inch drainpipe under the spillway was extended and a new weir was added to replace Weir No. 1. A pedestrian bridge was installed over the spillway.
2014	A geomembrane liner was installed at Tioga Dam over the upstream face of the Main Dam and over the exposed upstream face of the Auxiliary Dam.
2017	Removal of existing piers and installation of a steel beam to support the existing footbridge at the spillway at Rhinedollar Dam.
2018	SCE drew down the Saddlebag Lake reservoir, excavated lakebed sediments and inspected the sinkhole. It was confirmed that the leakage occurred underneath the previous repairs to the rock fracture and was repaired. As of September 2019, the leakage has been significantly reduced, indicated a successful repair.

cfs = cubic feet per second; MW = megawatt

(E) Unscheduled Outages

Table H-3 describes the unscheduled (forced) outages that occurred over the last 5 years (between 2019 and 2023).

Table H-3 Unscheduled Outages / Power Losses

Dates	Duration (hours)	Cause
6/01/2019	2	Loss of source line
8/13/2019	1.5	Unit bearing issues
9/16/2019–9/19/2019	75	Unit bearing issues

Dates	Duration (hours)	Cause
10/05/2019–12/11/2019	1,643	Loss of source line causing unit bearing damage
6/25/2020	2	Loss of source line
8/16/2020	2.5	Loss of source line
8/25/2020–11/02/2020	1,659	Penstock leak
2/03/2021	8	Loss of source line
3/06/2021	1.5	Loss of source line
6/07/2021	1	Issue in adjacent substation
7/26/2021	1	Loss of source line
8/05/2021	1	Issue in adjacent substation
12/26/2021–12/28/2021	57	Loss of source line
5/02/22–6/01/2022	723	Intake grid damage
11/09/2022	6	Loss of source line
2/27/2023–3/09/23	226	Avalanche hit adjacent substation
11/02/2023	2	Loss of source line

(F) Record of Compliance with Terms and Conditions of Existing License

FERC issued a new license to SCE for the Project on February 4, 1997. Project-specific license articles mandated by FERC and conditions submitted by the USFS under Section 4(e) of the Federal Power Act (FPA) are included in the License Order. SCE is responsible for complying with requirements of the FERC license, subsequent orders and amendments issued to-date, findings of FERC inspections, findings of other inspections under 18 CFR Part 12, as well as other FERC directives, information requests, or inquiries. SCE has not received a notice of violation or deviation from FERC since 2001. SCE’s compliance history related to inspections, incident reports, and temporary variances for minimum instream flow, reservoir levels, and ramping rates is summarized below. The complete compliance record for the Project for the current license term can be found on FERC’s eLibrary.

Deviations from Article 404 flow requirements occurred at the Project in 1999, which were filed with FERC in October 2000 and resolved in 2001. This is the only occurrence of flow deviations during the current license term. SCE’s compliance history related to inspections, incident reports, and temporary flow modifications are summarized below.

(1) Inspections

Over the term of the existing license, SCE has participated in FERC environmental inspections, operations inspections, and dam safety/operation inspections. Any subsequent FERC directives and items identified during the inspections as requiring attention have been addressed by SCE in a timely manner and written documentation filed with FERC.

(2) Incident Reporting

SCE filed four incident/deviation reports with FERC over the term of the existing license (1997 to 2024). In all cases, SCE timely notified FERC of the incident and filed a written incident report. The incident reports filed by SCE satisfy the requirements of 18 CFR § 12.10. None of these incidents resulted in serious damage to public or private property, and they were not considered a license violation by FERC.

The incidents include:

- SCE filed two incident reports, both in 2017, regarding the Saddlebag Lake sinkhole.
- Poole Powerhouse penstock had a rupture/leak incident in late summer 2020.
- There was an early-2023 incident involving the Poole Powerhouse penstock grids.

(3) Temporary Flow Deviations

SCE maintains minimum flows in Lee Vining Creek in accordance with USFS Section 4(e) Condition No. 4 (Minimum Streamflow Requirements), monitors flows in accordance with USFS Section 4(e) Condition No. 5 (Stream Gauges and Lake Level Monitoring Devices), and maintains reservoir levels in accordance with USFS Section 4(e) Condition No. 6 (Recreation, Visual, and Riparian Resources) of the existing Project license.

License Article 405 provides that flows should not be varied between October 15 and April 1 by more than 10 cubic feet per second from the average daily flow in early October (October 1 to 14).

License Article 403 provides that the minimum instream flows and lake levels required by USFS conditions may be modified for short periods upon mutual agreement among SCE, USFS, and the California Department of Fish and Wildlife.

Over the term of the current license, the Project has had several deviations to Condition Nos. 4, 5, and 6 and Article 405 regarding flow releases and reservoir levels. A summary of these deviations is provided in Table H-4.

Table H-4 SCE Flow Deviations Over the Current License Term

Date of Report of Deviation	Relevant License Article	Description
March 23–April 22, 1998	Condition No. 4	The allowable range during the 1997/1998 water year based on an average of the average daily flows for the first part of October 1997 was 0 to 19.2 cfs (+/- 10 cfs from 9.2 cfs). This flow was not met from March 23, 1998, through April 22, 1998.
May 22–24, 1998	Condition No. 4	The 1998/99 water year was defined as a wet year. An April 20, 1998, statement established a target minimum flow for the water year beginning on May 1, 1998. Average daily flows were less than 8.4 cfs (the allowed 60 percent below 14 cfs) on 3 days: May 22, 23, and 24, 1998.
August 12, 1998	Condition No. 5 and 6, Article 405	Ellery Lake levels dropped to 9,478.82 feet on August 12, 1998.
August 17, 1998	Condition No. 5 and 6, Article 405	Ellery Lake levels dropped to 9,484.82 feet on August 17, 1998.
August 18, 1998	Condition No. 5 and 6, Article 405	Ellery Lake levels dropped to 9,484.50 feet on August 18, 1998.
July 17–27, 1999	Condition No. 4	During periods when the net storage in the three reservoirs upstream of the powerhouse was increasing, minimum flows of 89 cfs were not met on July 17, 1999, through July 27, 1999.
August 9, 1999	Condition No. 4	During periods when the net storage in the three reservoirs upstream of the powerhouse was increasing, minimum flows of 27 cfs were not met on August 9, 1999.
September 18, 1999	Condition No. 4	During periods when the net storage in the three reservoirs upstream of the powerhouse was increasing minimum flows of 27 cfs were not met on September 18, 1999.
July 13, 2003	Condition No. 5 and 6, Article 405	The lake level fell to elevation 9,490.03 feet, 2.5 feet below the elevation of the spillway, for about 10 hours on July 13, 2003. A sudden, unexpected increase in air temperatures caused a rapid decrease in inflow to Rhinedollar [Ellery] Lake from Slate Creek, a significant (and uncontrolled) contributor to the reservoir. Monitoring equipment at the dam was not capable of providing real-time information about minor lake level fluctuations; the lake level was restored when field personnel noted the deviation.

cfs = cubic feet per second

(G) Actions Related to the Project that May Affect the Public

SCE maintains a Public Safety Plan for the Project that identifies the location of public safety measures and signage at Project facilities. The Public Safety Plan is reviewed and updated annually, as necessary. 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., powerhouse, switchyard, 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 restricted areas;
    - Trash racks on dam intakes structures; and
    - Boat barriers along dam spillways.

(H) Summary of Ownership and Operating Expenses

Annual ownership and operating costs for 2023 are summarized in Table H-5.

Table H-5 Annual Ownership and Operating Costs

Expense	Total
O&M Costs (based on 5-year average, 2019–2023)	$1,178,146
O&M Costs (2023)	$815,101
Depreciation (2023)	$780,353
Property Taxes (2023)	$249,326
Administrative & General Expenses (calculated from 2023 Net Book Value)	$386,438
Total	**$3,409,364**

O&M = operation and maintenance

(I) Annual Fees for Federal or Native American Lands

Annual fees for FERC Bill Year 2023, paid under Part I of the FPA, are listed in Table H-6.

Table H-6 Annual Fees for FERC Bill Year 2023

Fee	Total
Water for Power [a]	$33,992.20

Fee	Total
Federal Land Rents [b]	$9,286.71
Total	**$43,278.91**

[a] Charges for the purpose of reimbursing the United States for the costs of administration of Part I of the Federal Power Act.
[b] Annual fees paid for the occupancy of federal lands for flowlines, forebay and forebay tank and associated spillway channels, penstocks, power, and communication lines.

No Indian lands are included within the FERC Project Boundary.

(1) Information to be provided by an applicant who is not an existing licensee. An applicant that is not an existing licensee must provide.

SCE is an existing licensee; therefore, this section is not applicable.

References

CAEC (California Energy Commission). 2024. “Power Source Disclosure Program.” Accessed: June 11, 2024. Retrieved from: https://www.energy.ca.gov/programs-and-topics/programs/power-source-disclosure-program

CAISO (California Independent System Operator). 2024. *20 Year Transmission Outlook Update: Stakeholder Call*. Accessed: August 2024. Retrieved from: https://stakeholdercenter.caiso.com/InitiativeDocuments/Presentation-20YearTransmissionOutlook-Apr18-2024.pdf

CPUC (California Public Utility Commission). 2024. 2024 Padilla Report: Costs and Cost Savings for the RPS Program. Accessed: August 2024. Retrieved from: https://www.cpuc.ca.gov/-/media/cpuc-website/industries-and-topics/documents/energy/rps/2024/2024-padilla-reportvfinal.pdf

SCE (Southern California Edison). 2020a. Supporting Technical Information Document, Saddlebag Lake Dam. FERC Project No. 1388-CA. November 2020.

SCE (Southern California Edison). 2020b. 2020 Transmission Maintenance and Compliance Review (TMCR) Report. Accessed: August 2024. Retrieved from: https://www.sce.com/sites/default/files/inline-files/2020TMCRReportFinal.pdf

SCE (Southern California Edison). 2023a. Corporate Responsibility. Accessed: December 15, 2023. Retrieved from: https://www.sce.com/about-us/environment/protection-restoration.

SCE (Southern California Edison). 2023b. Energy Education Centers. Available online at: https://www.sce.com/business/news-events/Energy-Education-Center

USEIA (U.S. Energy Information Administration). 2022. Electricity Data. Accessed: August 2024. Retrieved from: https://www.eia.gov/electricity/data.php