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Sent electronically

August 13, 2025

Debbie-Anne A. Reese
Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

**Subject: Lee Vining Hydroelectric Project, FERC Project No. 1388;
Biological Assessment for the Sierra Nevada bighorn sheep (*Ovis canadensis sierrae*), Yosemite toad (*Anaxyrus canorus*), and whitebark pine (*Pinus albicaulis*)**

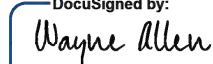
Dear Secretary Reese:

On January 29, 2025, Southern California Edison Company (SCE) filed with the Federal Energy Regulatory Commission (FERC) a Final Application for New License for the Lee Vining Project (FERC Project No. 1388). SCE has developed a Biological Assessment (BA) for the three listed species that occur within the vicinity of the Lee Vining Project: Yosemite toad, Sierra Nevada bighorn sheep, and whitebark pine.

On May 23, 2025, SCE submitted a draft BA to USFWS for review and comment; USFWS provided comments on July 3, 2025. SCE and the relicensing team met with USFWS on July 24, 2025 to discuss those comments and suggestions. The final BA (Attachment 1) is the result of these discussions and comments.

If you have any questions regarding this filing please contact Matthew Woodhall, SCE Relicensing Project Manager, by phone at (909) 362-1764 or via e-mail at matthew.woodhall@sce.com.

Sincerely,

DocuSigned by:

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Wayne P. Allen
Principal Manager

Enclosure:

- Attachment 1: Biological Assessment and Exhibits for the Sierra Nevada bighorn sheep (*Ovis canadensis sierrae*), Yosemite toad (*Anaxyrus canorus*), and whitebark pine (*Pinus albicaulis*): Lee Vining Hydroelectric Project Relicensing (FERC Project No. 1388) Mono County, California

Biological Assessment for the Sierra Nevada bighorn sheep (*Ovis canadensis sierrae*), Yosemite toad (*Anaxyrus canorus*), and whitebark pine (*Pinus albicaulis*):

**Lee Vining Hydroelectric Project
Relicensing
(FERC Project No. 1388)
Mono County, California**

Prepared for	Federal Energy Regulatory Commission 888 First St., NE Washington, DC 20426
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August 2025

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ACRONYM LIST

A

amsl	above mean sea level
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B

BA biological assessment

C

CDFW California Department of Fish and Wildlife

CFR Code of Federal Regulations

cfs cubic feet per second

CNDDDB California Natural Diversity Database

CNPS California Native Plant Society

CWA Clean Water Act

D

DLA draft license application

DO dissolved oxygen

E

EFH essential fish habitat

ESA Endangered Species Act

F

FERC Federal Energy Regulatory Commission

FLA final license application

FPA Federal Power Act

G

GIS Geographic Information System

I

INF Inyo National Forest

L

LADWP Los Angeles Department of Water and Power

M

MIF minimum instream flow

N

NPS National Park Service

O

O&M operations and maintenance

P

PAD Pre-Application Document

PCE primary constituent elements

PME protection, mitigation, and enhancement

Project Lee Vining Hydroelectric Project (FERC No. 1388)

S

SCE Southern California Edison

SHPO State Historic Preservation Office

SWRCB State Water Resources Control Board

T

TWG Technical Working Group

U

USC United States Code

USFS U.S. Forest Service

USFWS U.S. Fish and Wildlife Service

USGS U.S. Geological Survey

EXECUTIVE SUMMARY

Southern California Edison (SCE) is applying to the Federal Energy Regulatory Commission (FERC) for a new license to continue operation and maintenance of the existing 11.25-megawatt Lee Vining Hydroelectric Project (Project), Project No. 1388. Project facilities are located primarily within the Inyo National Forest, which is managed by the U.S. Forest Service. The Project would provide continued hydroelectric generation to meet part of SCE's power requirements, resource diversity, and capacity needs.

The Project, as it currently exists, occurs within areas federally designated as critical habitat for the federally listed endangered Sierra Nevada bighorn sheep (*Ovis canadensis sierrae*) and the federally listed threatened Yosemite toad (*Anaxyrus canorus*). Both the Sierra Nevada bighorn sheep and Yosemite toad are confirmed to occur in habitat adjacent to portions of the FERC Project Boundary. In addition to the two wildlife species, whitebark pine (*Pinus albicaulis*), a federally listed threatened species, also occurs in and around the FERC Project Boundary. The purpose and need for this biological assessment (BA) is to comply with the federal Endangered Species Act Section 7 requirement for federal agencies to consult with the U.S. Fish and Wildlife Service when that agency's action may result in an effect to a federally listed threatened or endangered species.

Based on the studies performed to support the license application, the location of the federally listed plant and wildlife species in relation to Project operations and maintenance proposed under the new license, the minimal scope of activities associated with Project operations and maintenance proposed under the new license, and the species' protective measures proposed in this BA, the following determinations were made with respect to the Project proposed under the new license:

- For Sierra Nevada bighorn sheep, **NO EFFECT** to the species and **NO EFFECT** to critical habitat;
- For Yosemite toad, **NO EFFECT** to the species and **NO EFFECT** to critical habitat; and
- For whitebark pine, **MAY AFFECT, BUT NOT LIKELY TO ADVERSELY AFFECT** the species.

1.0 INTRODUCTION

1.1. PURPOSE AND NEED OF THE PROPOSED ACTION

Southern California Edison (SCE) is the Licensee, owner, and operator of the 11.25-megawatt Lee Vining Hydroelectric Project (Project), Federal Energy Regulatory Commission (FERC) Project No. 1388. Project facilities are located primarily within the Inyo National Forest (INF), which is managed by the U.S. Forest Service (USFS). SCE proposes to continue Project operations and maintenance (O&M) under a new license issued by FERC pursuant to the Federal Power Act (FPA). Upon the issuance of a new license, key components are the conditions placed in the Project license to ensure compliance with the FPA and other applicable laws. The Project would provide hydroelectric generation to meet part of SCE's power requirements, resource diversity, and capacity needs.

The purpose and need for this biological assessment (BA) is to comply with the federal Endangered Species Act (ESA) Section 7 requirement for federal agencies to consult with the U.S. Fish and Wildlife Service (USFWS) when that agency's action may result in an effect to a federally listed threatened or endangered species or their designated critical habitat. In this case, the federal action is FERC's issuance of a new license to SCE to continue operation of the Project.

The Project, as it currently exists, occurs within areas federally designated as critical habitat for the federally listed threatened Yosemite toad (*Anaxyrus canorus*) and the federally listed endangered Sierra Nevada bighorn sheep (*Ovis canadensis sierrae*) (Exhibits 1a, Critical Habitat Yosemite Toad and 1b, Critical Habitat Sierra Nevada Bighorn Sheep). Also, both the Yosemite toad and Sierra Nevada bighorn sheep are confirmed to occur in habitat adjacent to portions of the FERC Project Boundary (Attachment 1, TERR-2 General Wildlife Technical Report).

In addition to the two wildlife species, whitebark pine (*Pinus albicaulis*), a federally listed threatened species, also occurs in and around the FERC Project Boundary (Exhibit 1c, Whitebark Pine Distribution and Attachment 2, TERR-1 Botanical Resources Technical Report)

Because the issuance of a new license to SCE to continue operations to generate hydroelectric power is a federal action, FERC is required to determine whether the new license that may affect the Yosemite toad, Sierra Nevada bighorn sheep, and whitebark pine, or the species' designated critical habitat, and if it may affect listed species or critical habitat, FERC is required to consult with the USFWS.

1.2. GENERAL LOCATION OF THE PROPOSED ACTION

The Project is located on the eastern slope of the eastern Sierra Nevada nearly abutting the eastern boundary of Yosemite National Park and extending eastward in the Lee Vining Creek Watershed; its western terminus is approximately 9 miles upstream from Mono Lake and the town of Lee Vining in Mono County, California (Exhibit 2, Project Location). The Project is sited on Lee Vining Creek, largely within the INF managed by

the USFS; the remaining Project lands are privately owned by SCE. The Project consists of three dams and reservoirs, an auxiliary dam, a flowline consisting of a pipeline and penstock, and a powerhouse. These features and facilities all occur within a defined FERC boundary (hereafter referred to as the “FERC Project Boundary”). The Proposed Action under consideration is the issuance of a new license from FERC. This new license would include O&M of the facilities within the existing FERC Project Boundary and include minor alterations to that existing FERC Project Boundary (discussed in Section 3.1.1, FERC Project Boundary Modifications). Subsequently, the area associated with the Proposed Action (relevant features and facilities within the existing FERC Project Boundary) is hereafter referred to as the “Action Area” in this BA.

1.3. BRIEF DESCRIPTION OF BIOLOGICAL OR HABITAT STUDIES CONDUCTED FOR THE ACTION

Terrestrial biological resource studies were performed in 2022, 2023, and 2024 in support of relicensing the Project. General wildlife surveys were undertaken in 2022 and 2023, and focused surveys for Yosemite toad occurred in 2022, 2023, and 2024.

During each survey, all wildlife encountered were noted, and industry standard techniques for wildlife surveys were employed, such as identifying wildlife species visually (viewing characteristic markings, behaviors, or diagnostic signs [such as scat, footprints, burrows, etc.]) with and without binoculars and aurally (listening to diagnostic vocalizations); lifting, overturning, and carefully replacing objects such as rocks, boards, and debris; and documenting any active or abandoned raptor nests using a GPS-enabled device.

Sierra Nevada bighorn sheep observations and evidence of presence were included as part of the general wildlife surveys in 2022 and 2023. No focused surveys for Sierra Nevada bighorn sheep were conducted because no potential issues or concerns were identified by any of the resource agencies or other technical working group (TWG) participants during the study planning phase. The species occupies large ranges, and any interaction with Project facilities or the associated actions are expected to be minimal, if at all. Project facilities are located in an area between two herds (CDFW, 2024), and transit across this area by both herds is anticipated even though it is not a core area for either.

Field studies in support of relicensing and this BA focused on the Yosemite toad because of the known species occurrence in the immediate vicinity of the Project and Action Area. In 2022, five field surveys for Yosemite toad occurred between June 1 and August 24 across the 406-acre Yosemite toad study area, which includes relevant portions of the FERC Project Boundary and adjacent lands (Exhibit 3, Yosemite Toad Study Area). The 2022 survey included a breeding habitat assessment across the entire Yosemite toad study area and focused visual encounter surveys in the following areas: at Saddlebag Lake, near the inlet at Tioga Lake, historic occurrences at the north end of Saddlebag Lake, and the known potential for suitable habitat along Lee Vining Creek.

In 2023, 10 separate surveys were conducted in the potential breeding habitat within the Yosemite toad study area between July 6 and November 1. The areas surveyed in 2023

were expanded to include the additional potential breeding habitat observed in the 2022 survey. Additional surveys were conducted in 2024 to confirm the previous breeding locations and to further monitor and describe the breeding and surrounding upland habitat.

Botanical surveys for special status plants were performed in 2022 and 2023. Botanical field surveys were conducted in 2022 on July 18, 19, 20, 21, and 22 and August 15, 16, 17, 18, and 19. In 2023, surveys were performed on July 24, 25, 26, and 27 and August 18, 19, 20, and 22. Systematic-pedestrian surveys were conducted throughout the botanical resources study area in all areas of suitable habitat.

2.0 CONSULTATION HISTORY

In preparation to file the Pre-Application Document and Notice of Intent filed in August 2021, SCE hosted Terrestrial and Botanical TWG meetings on January 27, February 24, April 7, and May 26, 2021. These TWG meetings resulted in study requests from stakeholders to address questions regarding wildlife and botanical resources. Notes and materials from these meetings are available on SCE's Project website (www.sce.com/leevining).

SCE filed draft Study Plans with the Pre-Application Document and Notice of Intent on August 12, 2021, to address issues discussed with the TWGs. The stakeholder comment period for these filings ended on January 18, 2022. SCE reviewed all comments received and drafted Revised Technical Study Plans, which were distributed to the TWGs on February 18, 2022, for another 30-day review period. Stakeholder comments on the Revised Technical Study Plans were reviewed and incorporated as appropriate in the Final Technical Study Plans, which were filed with FERC on April 25, 2022 (SCE, 2022). Following the filing of the Technical Study Plans, extensive coordination regarding Yosemite toad survey timing and methods occurred between SCE, Psomas, USFS, U.S. Fish and Wildlife (USFWS), California Department of Fish and Wildlife (CDFW), and National Park Service (NPS) before and during survey implementation in 2022 and 2023. Coordination efforts consisted of several phone calls, in-person meetings, and emails. The following summarizes those communications:

- April through June 2022: Coordination with USFWS and CDFW on Yosemite toad survey timing for 2022 season.
- June, July, and August 2022: Discussions/summaries of 2022 survey findings as they occurred after each field event with CDFW and USFWS.
- January 2023: Planning call for 2023 field efforts with CDFW and USFWS.
- March through July 2023: Coordination with USFS, CDFW, and NPS on DNA sample collection, use of existing agency permits for DNA collection, and survey timing for the 2023 season.

- August and September 2023: NPS collection of Yosemite toad DNA samples and correspondence about a probable results timeline.

Ultimately, the agencies and SCE were in full agreement with methods and survey timing for Yosemite toad surveys. Additionally, the agencies and SCE did not identify any survey efforts beyond what had been detailed in the Final Technical Study Plan to appropriately address Sierra Nevada bighorn sheep. A complete compilation of email correspondence, summaries of phone conversations, and in-person meeting summaries will be filed with the Final License Application (FLA) consultation log.

Draft technical reports were distributed to TWGs on April 16, 2024, for a 60-day comment period. On May 14, 2024, SCE held a public meeting at the Lee Vining Community Center to discuss the draft reports and study findings to date. On June 12, 2024, at the end of the comment period, comments were received from USFS, USFWS, CDFW, State Water Resources Control Board (SWRCB), and Mono Lake Committee. Final technical reports were filed with the Draft License Application (DLA) on August 27, 2024. On November 25, 2024, at the end of the DLA comment period, comments were received from CDFW, USFWS, USFS, and SWRCB.

All comments received related to terrestrial and/or wildlife/botanical resources performed for the Project are included in Table 1.3-1.

Table 1.3-1. Consultation Summary—Response to Comments

Comment Number	Entity	Date/Forum	Comment	SCE Response
1	CDFW	6/29/2022 Phone discussions	Discussion about survey results and field observations	The results and observations discussed are included in the Terrestrial Wildlife Technical Memorandum.
2	CDFW	7/25/2022 Phone discussion	Discussion about survey results and field observations	The results and observations discussed are included in the Terrestrial Wildlife Technical Memorandum.
3	CDFW	12/12/2022 Virtual meeting	Discussion about 2022 field observations and 2023 Study Plan revisions and Study Area expansion.	Revised study methods were implemented as discussed, as was the expanded Study Area.
4	CDFW	12/17/2022 Email communications	CDFW recommends applying for the USFWS Take Permit and the CDFW Scientific Collecting Permit necessary for collecting of DNA samples of ESA/CESA listed species.	Project team partnered with Yosemite National Park biologist who holds the necessary permits to collect DNA samples of the target species. (response updated August 2024).
5	USFWS, CDFW	1/6/2023 Virtual meeting	Discussion about 2023 Study Plan revisions and Study Area expansion.	Revised study methods were implemented as discussed, as was the expanded Study Area.
6	USFS	2/9/2023 In-person discussion	Discussions about 2022 field observations and 2023 study methods.	Study methods were implemented as discussed.
7	CDFW	7/27/2023 Email communications	Confirmation of interest and contact information for submitting DNA sample for large carnivore species analysis.	Project team has a sample to submit for CDFW analysis.
8	CDFW	8/8/2023 In-person discussion	Confirmed interest in large carnivore sample for DNA analysis.	Delivered sample for analysis at CDFW office.
9	CDFW	11/29/2023 Email communications	Large carnivore DNA analysis complete.	The species identified (coyote) has already been documented by other survey methods and is included in the wildlife compendium of the Terrestrial Wildlife Technical Report.

Comment Number	Entity	Date/Forum	Comment	SCE Response
10	USFS	1/12/2024 In-person discussion	Discussions about survey results and field observations.	The details discussed are provided in the Terrestrial Wildlife and Yosemite Toad Technical Reports.
11	CDFW	05/28/2024 Comments on Draft Technical Reports	Comment on Bighorn sheep ecology	The Project Area is located between two area herds. Based on GIS data available from CDFW's website, this area can be used by either herd but does not seem to be part of either herd's primary territory. The role of bighorn sheep in the surrounding ecosystem is beyond the scope of the wildlife study for this relicensing. In general, bighorn sheep have a positive effect on the ecosystem.
12	CDFW	05/28/2024 Comments on Draft Technical Reports	Could surveying these 12 ponds create helpful comparable data between YOTO populations within and outside of the project area? As YOTO females go to higher elevations after breeding, maybe those ponds could be a good indicator of fitness levels in the project area population.	The area surrounding the Lee Vining Yosemite toad study area, especially the Tioga Pass Pond area, has been well surveyed for Yosemite toad in the past by many researchers and has been well reported on in the literature. Additional surveys would not increase our knowledge of the toads.
13	CDFW	05/28/2024 Comments on Draft Technical Reports	Should stocking data and disease trend data be correlated with YOTO survival to identify more clear understanding?	The relationship between stocking and disease transmission from trout to Yosemite toad has not been established and is beyond the scope of the studies needed for relicensing. Stocking policies are established by CDFW.
14	CDFW	05/28/2024 Comments on Draft Technical Reports	Upland suitable habitat and nesting areas should be monitored.	Upland habitat is important to the life history of the Yosemite toad because this is where the toad spends a majority of its life. Field surveys for Yosemite toad will continue into 2024 with one of the goals will be to characterize the surrounding upland habitat. Preliminary results have determined that substantial upland habitat is present through the areas adjacent to the FERC Project Boundary and no barriers are present (or proposed) between the observed breeding areas and upland habitat. Regardless, the upland habitat is outside the FERC Project Boundary and is well outside the influence of SCE's operations and maintenance. SCE believes that since the toads have persisted and are in areas not

Comment Number	Entity	Date/Forum	Comment	SCE Response
				subject to SCE O&M, monitoring these populations is not currently necessary.
15	CDFW	05/28/2024 Comments on Draft Technical Reports	Please add which Critical Habitat Unit this project is located in. There is specific language in the Critical Habitat rule which talks about the physical and biological features within each Unit where special management considerations may be required. See page 59082 in the Federal Register Notice for Yosemite toad Critical Habitat.	The following will be incorporated into the Yosemite toad report: - Critical Habitat Unit 5. Yosemite Toad Critical Habitat: - The primary constituent elements of the physical or biological features essential to the conservation of the Yosemite toad for all critical habitat units consist of two components: - (1) Aquatic breeding habitat. - (a) This habitat consists of bodies of fresh water, including wet meadows, slow-moving streams, shallow ponds, -spring systems and shallow areas of lakes, that: (1) Are typically (or become) inundated during snowmelt; (2) Hold water for a minimum of 5 weeks, but more typically 7 to 8 weeks; and (3) Contain sufficient food for tadpole development. - (b) During periods of drought or less than average rainfall, these breeding sites may not hold surface water long enough for individual Yosemite toads to complete metamorphosis, but they are still considered essential breeding habitat because they provide habitat in most years. - (2) Upland areas. This habitat consists of areas adjacent to or surrounding breeding habitat up to a distance of 1.25 kilometers (0.78 miles) in most cases (that is, depending on surrounding landscape and dispersal barriers), including seeps, springheads, talus and boulders, and areas that provide: (i) Sufficient cover (including rodent burrows, logs, rocks, and other surface objects) to provide summer refugia, (ii) Foraging habitat, (iii) Adequate prey resources, (iv) Physical structure for predator avoidance, (v) Overwintering refugia for juvenile and adult Yosemite toads, (vi) Dispersal corridors

Comment Number	Entity	Date/Forum	Comment	SCE Response
				between aquatic breeding habitats, (vii) Dispersal corridors between breeding habitats and areas of suitable summer and winter refugia and foraging habitat, and/or (viii) The natural hydrologic regime of aquatic habitats (the catchment). - (b) These upland areas should also maintain sufficient water quality to provide for the various life stages of the Yosemite toad and its prey base. -Critical habitat does not include manmade structures (such as buildings, aqueducts, runways, roads, and other paved areas) and the land on which they are located existing within the legal boundaries of designated critical habitat on September 26, 2016.
16	CDFW	05/28/2024 Comments on Draft Technical Reports	How is the ecological impact of the dam affected by heavy or low snow years?	The breeding locations observed during these studies were observed to be hydrologically influenced by adjacent snow packs and not by Project operations, including levels of Project-stored water or released flows. The upstream and downstream water levels within the Project system are regulated. The water level in Saddlebag Dam is drawn down to the minimum each fall to allow it to receive snowmelt the following spring. There are minimum instream flows that must be maintained. Under the current license, minimum flow requirements are based on the water year type and water inflow into each reservoir. Under any new license, the methods for determining a wet, normal, and/or dry year will be reviewed and modified, as necessary.
17	CDFW	05/28/2024 Comments on Draft Technical Reports	Could the dams impact on the water cycle and local biodiversity have an impact on YOTO outside of 200 ft buffer zone?	See response to Comment 16 regarding water cycle affects.
18	CDFW	05/28/2024 Comments on Draft Technical Reports	Is there a pattern year for YOTO breeding?	Yosemite toad begin breeding when sufficient amounts of water have pooled in breeding locations from snow melt. Yosemite toad tadpoles can metamorphize within weeks after hatching (early summer months); however, tadpoles

Comment Number	Entity	Date/Forum	Comment	SCE Response
				were also observed in water trapped beneath ice during field studies into the late fall months.
19	CDFW	05/28/2024 Comments on Draft Technical Reports	What is the plan to increase YOTO #s after a 50% decline?	While many factors contribute to declining toad populations, the studies performed indicate that neither SCE's facilities nor their operations are factors in Yosemite toad population decline. SCE is not making plans to "increase YOTO numbers" and is not responsible for developing a recovery plan.
20	CDFW	05/28/2024 Comments on Draft Technical Reports	Does project impact any YOTO prey species?	The system has been running for over 100 years and the ecologies surrounding the Project have equilibrated to the regime. Although the prey base for Yosemite toad was not studied, the fact that they have persisted alongside the Project is evidence that a sufficient prey base is present to support the population.
21	CDFW	05/28/2024 Comments on Draft Technical Reports	Should surveillance be increased around snowmelt?	Our studies have started at the onset of snow melt, and we have collected sufficient data to analyze the relationship between Project facilities and operations and the YOTO populations. Continued surveillance is not necessary to inform the relicensing or new license conditions.
22	CDFW	05/28/2024 Comments on Draft Technical Reports	Should correlation between YOTO survival and chytrid fungus, roads, and grazing proximity be more closely monitored to determine the most serious threat?	These items have been addressed extensively in literature. No evidence of Chytrid in the Yosemite toad populations studied for this relicensing was observed during the study effort.
23	CDFW	05/28/2024 Comments on Draft Technical Reports	When does the distance between disconnected YOTO patches become too far for reliable migration?	We know that Yosemite toad can move over 2,250 feet after breeding. A 2022 study by Maier et al. looks at Yosemite toad genetics within different meadow neighborhoods and discusses observed migration distances between viable breeding meadows. Regardless, the relationship between disconnected populations is beyond the scope of the studies performed for the relicensing.

Comment Number	Entity	Date/Forum	Comment	SCE Response
24	CDFW	05/28/2024 Comments on Draft Technical Reports	Instead of focusing on the breeding habitat, where their presence is short and identification difficult, maybe upland suitable habitat should be prioritized to provide more data.	See response to Comment 23 regarding topic being beyond the scope of relicensing and response to Comment 14 regarding relevance of studies for suitable upland habitat.
25	CDFW	05/28/2024 Comments on Draft Technical Reports	Seems unlikely there are no consistent patterns in differences between occupied and unoccupied areas.	Our observations concerning unoccupied habitat are not inconsistent with the literature for Yosemite toad. In the Yosemite toad study area, there are large areas of potentially suitable habitat that is currently unoccupied. These toads tend to be strongly philopatric. But that does not mean that this species could not occupy any of those potentially suitable areas in the future. In general, for any species, 100% of suitable habitat is never occupied.
26	CDFW	05/28/2024 Comments on Draft Technical Reports	Should relationship and interaction levels between YOTO and tree frog be more closely monitored?	Tree frogs and Yosemite toad co-occur through the Sierra Nevada. There is no nexus between intra-species interactions and the Project that warrants monitoring.
27	CDFW	05/28/2024 Comments on Draft Technical Reports	Overarching concerns: Lack of data from 2022-2023 field seasons may require another season of research before agreement is extended Many suitable habitat areas are devoid of YOTO, especially compared to previously, are the dams a contributing factor? Upland areas should be studied to compare YOTO populations to the project area. How is YOTO impacted by stocking and disease rates? Would improved water diversion tactics during a year of excess snowmelt provide YOTO with more suitable shallow water habitat? Should indicator species be surveyed more consistently? Lack of historical data provided as well, at	An additional field season (2024) took place. See responses to Comments 19-23 regarding contribution of Project to Yosemite toad population numbers. See response to Comment 14 regarding upland habitat. See response to Comment 13 regarding fish stocking and disease rates. See response to Comment 16 regarding the lack of hydrologic connection to breeding habitat. The Project facilities and operations have been in place for over 100 years and are considered existing conditions. The persistence of special status wildlife or other indicator species on-site and in the vicinity is evidence the Project is not negatively affecting these populations.

Comment Number	Entity	Date/Forum	Comment	SCE Response
			least in terms of clearly understanding whether the project is impacting species sustainability.	
28	USFWS	5/21/2024 Comments on Draft Technical Report	What about a description of lakeshore habitat from all 3 reservoirs within the project area.	A description has been added to the report.
29	USFWS	5/21/2024 Comments on Draft Technical Report	Which reservoir are you referring to here?	Saddlebag Lake. This has been clarified in the report.
30	USFWS	5/21/2024 Comments on Draft Technical Report	Please add which Critical Habitat Unit this project is located in (Tuolumne Meadows/Cathedral). There is specific language in the Critical Habitat rule which talks about the physical and biological features within each Unit where special management considerations may be required. See page 59082 in the Federal Register Notice for Yosemite toad Critical Habitat.	Critical Habitat Unit 5. Yosemite Toad Critical Habitat: The primary constituent elements of the physical or biological features essential to the conservation of the Yosemite toad for all critical habitat units consist of two components: - (i) Aquatic breeding habitat. - (A) This habitat consists of bodies of fresh water, including wet meadows, slow-moving streams, shallow ponds, - (ii) Upland areas. spring systems, and shallow areas of lakes, that: (1) Are typically (or become) inundated during snowmelt; (2) Hold water for a minimum of 5 weeks, but more typically 7 to 8 weeks; and (3) Contain sufficient food for tadpole development. - (B) During periods of drought or less than average rainfall, these breeding sites may not hold surface water long enough for individual Yosemite toads to complete metamorphosis, but they are still considered essential breeding habitat because they provide habitat in most years. - (A) This habitat consists of areas adjacent to or surrounding breeding habitat up to a distance of 1.25 kilometers (0.78 miles) in most cases (that is, depending on surrounding landscape and dispersal barriers), including seeps, springheads, talus and boulders, and

Comment Number	Entity	Date/Forum	Comment	SCE Response
				areas that provide: (1) Sufficient cover (including rodent burrows, logs, rocks, and other surface objects) to provide summer refugia, (2) Foraging habitat, (3) Adequate prey resources, (4) Physical structure for predator avoidance, (5) Overwintering refugia for juvenile and adult Yosemite toads, (6) Dispersal corridors between aquatic breeding habitats, (7) Dispersal corridors between breeding habitats and areas of suitable summer and winter refugia and foraging habitat, and/or (8) The natural hydrologic regime of aquatic habitats (the catchment). - (B) These upland areas should also maintain sufficient water quality to provide for the various life stages of the Yosemite toad and its prey base. - (iii) Critical habitat does not include manmade structures (such as buildings, aqueducts, runways, roads, and other paved areas) and the land on which they are located existing within the legal boundaries of designated critical habitat on September 26, 2016.
31	USFWS	5/21/2024 Comments on Draft Technical Report	Ensure this PCE is addressed in your BA given the nature of the project.	Comment noted.
32	USFWS	5/21/2024 Comments on Draft Technical Report	Additional citation: Dodge, C.M., C. Brown, A.J. Lind, R.A. Knapp, L.R. Wilkinson, and V.T. Vredenburg. 2024. Historical and contemporary impacts of an invasive fungal pathogen on the Yosemite toad. Biological Conservation 291:110504.	This reference has been added to the list of citations.
33	USFWS	5/21/2024 Comments on Draft Technical Report	The average is 68", in 2023 the snow depth was 64.5" yet it was 211% of average. Please explain.	The typo was corrected in the report. The percentages remain correct but the previous measurement values erroneously listed snow water equivalent rather than snow depth.
34	USFWS	5/21/2024	To aid in identifying which areas are being described in the text, consider using the	The report has been updated to reflect these edits.

Comment Number	Entity	Date/Forum	Comment	SCE Response
		Comments on Draft Technical Report	reference numbers (1-50) shown in Figures A-4 through A-5 to better help the reader. For example you could reference Northern Saddlebag Lake, Figure 4-1, pool numbers 1-9	
35	USFWS	5/21/2024 Comments on Draft Technical Report	Add the pool numbers to aid the reader.	The report has been updated to reflect these edits.
36	USFWS	5/21/2024 Comments on Draft Technical Report	Were these two ponds filled with water in 2023? Reference Figure in Appendix A.	Yes, and no potential evidence of toad breeding was observed.
37	USFWS	5/21/2024 Comments on Draft Technical Report	To aid in identifying which areas are being described in the text, consider using the reference numbers (1-50) shown in Figures A-4 through A-5 to better help the reader. For example you could reference Upper Lee Vining Creek, acoustic recorder locations as Figure 4-2, pool number 16	The report has been updated to reflect these edits.
38	USFWS	5/21/2024 Comments on Draft Technical Report	Consider adding a Figure which depicts the critical habitat polygon compared to the action area.	A figure has been added to the report.
39	USFWS	5/21/2024 Comments on Draft Technical Report	At the technical team meeting in Lee Vining it was conveyed that this breeding area is not within the FERC boundary yet this Figure clearly shows the boundary bisecting the breeding habitat. Please explain the discrepancy.	The FERC Project Boundary shown in the exhibit is based on the GIS data on file with FERC. These figures do not represent the most accurate and up-to-date GIS information surrounding the reservoirs or Lee Vining Creek. The precise FERC Project Boundary around the majority of Tioga Lake ends at the established water line (associated with static topography of the Tioga Dam crest). The occupied breeding habitat observed does not extend past that water line. A footnote has been added to the exhibit clarifying this discrepancy.
40	SWRCB	6/11/2024	Yosemite toads (<i>Anaxyrus canorus</i>) are currently listed as threatened under the	SCE disagrees that DNA is vital in helping determine if Project operations affect critical habitat for the Yosemite

Comment Number	Entity	Date/Forum	Comment	SCE Response
			federal ESA and designated as a Species of Special Concern by the California Department of Fish and Wildlife. Visual encounter and acoustic recording survey methods only encountered confirmed Yosemite toads in the South of Saddlebag Lake survey area. The study states Yosemite toads are known to interbreed with the Western toad (<i>Anaxyrus boreas</i>) with the closest known location being approximately 4.7 miles north of Saddlebag Lake. DNA samples collected in 2023 are currently being processed and compared against a hybrid genetic panel developed by the El Dorado National Forest and are not yet ready for review. The results of the DNA sampling conducted in 2023 are vital in helping determine if Project operations affect critical habitat for the Yosemite toad. DNA sampling will also determine the frequency of interbreeding between the Yosemite and Western toads. State Water Board staff look forward to seeing the DNA sampling results to better understand potential Project effects. If the populations of toad located in Upper Lee Vining Creek and adjacent to Tioga Lake are determined to be <i>Anaxyrus boreas</i>, the draft license application should include discussion regarding the extent to which Project operations (i.e., flows within Lee Vining Creek and Tioga Lake levels) support habitat for these populations. Additional data collection may be required to understand whether Yosemite toad populations in these two	toad. Further, while the DNA sampling will help determine if hybridization has occurred in the breeding habitat adjacent to the FERC Action Area by Saddlebag Lake and Upper Lee Vining Creek, the DNA results will not be available in time to inform the DLA.

Comment Number	Entity	Date/Forum	Comment	SCE Response
			areas are stable, or how they may respond to Project operations under various water year types.	
41	USFS	6/12/2024 Comments on Draft Technical Reports	The assumptions about egg masses not belonging to Yosemite toads if those observations weren't tied to positive auditory observations. I think we would assume the opposite, just because the acoustic monitors didn't capture a call doesn't mean those egg masses aren't Yosemite toads. My guess is the USFWS would want us to approach it this way.	Because of the potential for interbreeding, we have kept these identifications to the genus level at this time in lieu of actual direct observations for the metamorphs and adults or genetic data.
42	USFS	12/27/2023 Comments on 2022 Draft Technical Report	This letter is to comment on the technical surveys performed for the 2022 and 2023 period as required for the relicensing of the Southern California Edison hydroelectric facilities in the Lee Vining Creek drainage. The survey studies are: general botanical resources, water quality, stream fish populations, reservoir fish populations and hydrology operation modeling. For the Owens River watershed, the 2022 water year received a very low snowpack with a seasonal average of 40% and a precipitation average of 40% as well. The 2023 water year saw the largest recorded snowpack in recorded history with a seasonal average of 266% and a seasonal precipitation average of 161%. For seasonal snowpack this a drastic change of approximately 565% between the two years and a 300% change for seasonal precipitation. The hydroelectric license is for a 30-year period and with only these	Project effects will be assessed based on the best available scientific and commercial data, including technical surveys performed in 2022 and 2023, and there is adequate information to assess potential Project effects. Future O&M activities resulting in vegetation removal/ground disturbance over the new license term would be addressed in the Vegetation Management Plan, which may include additional survey(s). Given stochasticity in plant population sizes, a PME addressing potential future threats may be more appropriate than a third consecutive year of plant surveys.

Comment Number	Entity	Date/Forum	Comment	SCE Response
			two years of data collection guiding the relicensing process, anomalous weather events could skew what is already a limited dataset and provide a flawed basis for management decisions. A similar situation occurred with Colorado River water flows, when past allocation decisions were based on very high flow years. We are concerned that a similar situation could unfold given that these survey studies are based on two years of data collection, with one of those years being the extreme winter of 2022-2023. For this reason, we would like to see at least one more year of data collection for the relicensing process.	
43	CDFW	11/22/2023 Comments on 2022 Draft Technical Report	Comment: The CNPS identifies that mountain bent grass (<i>Agrostis humilis</i>) (California Rare Plant Rank 2B.3-rare, threatened or endangered in California) is threatened by foot traffic and vehicles and possibly threatened by grazing and trampling. SCE should identify the potential for these threats and any other threats (e.g., maintenance activities) at each population location to determine the vulnerability, condition of occurrences, and if PME measures are needed (e.g., signage, fencing) to protect the plant.	SCE will discuss potential threats to mountain bent grass populations in the DLA. PME measures will be included in the DLA for mountain bent grass, if appropriate.
44	CDFW	11/22/2023 Comments on 2022 Draft Technical Report	Comment: On January 14th, 2022, CDFW proposed a Riparian Monitoring and Community Health Study. SCE responded that 'sufficient data exists from ongoing Riparian Monitoring Evaluations conducted as part of the license'. SCE has shared with CDFW via email various Riparian Reports associated with the existing FERC	SCE provided historic riparian reports and other relevant existing data to interested Stakeholders when requested. If additional Stakeholders would like this information, SCE can provide it. However, SCE does not intend to provide these reports and data on the website.

Comment Number	Entity	Date/Forum	Comment	SCE Response
			License requirements; however, these reports should be made available for review on the Projects relicensing website. Additionally, SCE responded in the Revised Technical Study Plans that raw data would be provided to the TWG. This data should also be made available on the Projects relicensing website. All existing available data that SCE produced as part of the license (e.g., riparian monitoring and evaluations) should be made available for review. Providing this data later with the DLA will not provide stakeholders sufficient time to review the data in a meaningful way.	
45	CDFW	11/22/2023 Comments on 2022 Draft Technical Report	Comment: Much of the Botanical Resource study area is outside of the FERC Project area and is focused only around Project facilities or recreational areas. Question: Does sufficient data exist to provide a baseline of the distribution of special status plant species within the FERC Project area?	The Botanical Resources Study Area was determined in consultation with Stakeholders during several TWG meetings prior to the field studies. The study area was developed to address potential future O&M activities, which would occur around Project facilities. The studies were designed to document baseline conditions (i.e., Lee Vining Creek with flow conditions similar to that under the current license).
46	CDFW	11/22/2023 Comments on 2022 Draft Technical Report	CDFW requests the following spatial data be provided as shapefiles or geodatabase: Botanical Study Area boundary	Data will be provided with distribution of draft reports.
47	CDFW	11/22/2023 Comments on 2022 Draft Technical Report	CDFW requests the following spatial data be provided as shapefiles or geodatabase: NDVI: Sampling plots (wet meadow), Sampling plots (willow riparian scrub), Study Sites (Test), Study Sites (Control)	Data will be provided with distribution of draft reports.

Comment Number	Entity	Date/Forum	Comment	SCE Response
48	CDFW	11/22/2023 Comments on 2022 Draft Technical Report	CDFW requests the following spatial data be provided as shapefiles or geodatabase: Special-status plant species populations	Data will be provided with distribution of draft reports.

Bd = *Batrachochytrium dendrobatidis*; CDFW = California Department of Fish and Wildlife; CESA = California Endangered Species Act; CNDDB = California Natural Diversity Database; DLA = Draft License Application; FERC = Federal Energy Regulatory Commission; ft = feet; FWS = Fish and Wildlife Service; O&M = operation and maintenance; PAD = Pre-Application Document; SCE = Southern California Edison; TWG = Technical Working Group; USFS = U.S. Forest Service; VES = visual encounter survey; YOTO = Yosemite Toad

3.0 DESCRIPTION OF THE PROPOSED ACTION

The Proposed Action is FERC's issuance of a new license to SCE for continued O&M of the Project.

3.1. SUMMARY OF SCE'S PROPOSED PROJECT DESCRIPTION UNDER THE NEW LICENSE

SCE, the Licensee and owner, currently operates the Project under a 30-year license issued by FERC set to expire on January 31, 2027. SCE is seeking to renew its FERC license to continue to operate the Project. Exhibit 4 (Project Features) provides an overview of the location and general layout of facilities relative to the Action Area and the surrounding landscape.

The Project is located on Lee Vining Creek near the community of Lee Vining in Inyo County, California. Project facilities are located primarily within the INF and include 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.

The Project has an authorized total dependable generating capacity of 11.25 MW. Under the existing Project license, the FERC Action Area includes approximately 590.8 acres (96 percent) of Project lands that are federally owned and administered by the USFS and 24.7 acres (4 percent) that are privately owned by SCE. SCE is not proposing any changes to Project maintenance or any new construction. The Project is operated in compliance with existing regulatory requirements, agreements, and water rights to generate power. SCE is proposing to make minor adjustments to its minimum instream flow (MIF).

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

Using the No-Action Alternative as a baseline, this section identifies modifications that will occur to the Project under the Proposed Action, including:

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

Note that under the No-Action Alternative, the Project would continue to operate under the terms and conditions of the current license.

3.1.1. FERC PROJECT BOUNDARY MODIFICATIONS

Pursuant to 18 Code of Federal Regulations (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 from the FERC Project Boundary. Results of SCE's review include the following:

- Addition of areas that are currently being used for O&M activities that are not currently reflected in the FERC Project Boundary;
- Removal of areas that are not necessary for O&M activities;
- Slight adjustments where the current 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 3.1-1 and Table 3.1-2 and displayed in Exhibits 5a to 5c (Proposed FERC Boundary Changes).

Table 3.1-1. Proposed FERC Project Boundary Modifications Related to O&M Activities

ID	Current Description	Proposed Action	Reason for Proposed FERC Project Boundary Modification
O&M—1	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 needed for Project operations.
O&M—2	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 3.1-2. Proposed FERC Project Boundary Modifications Related to Project Roads and/or to the Project Roads Inventory

ID	Current Description	Proposed Action	Reason for Proposed FERC Project Boundary Modification
Road—1	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	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	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—4	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	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 Energy Regulatory Commission; ID = identification; SCE = Southern California Edison; USFS = U.S. Forest Service

The proposed boundary modifications described above would result in land ownership within the FERC Project Boundary shown in Table 3.1-3.

Table 3.1-3. 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%

3.1.2. PROJECT FACILITIES

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

3.1.3. PROJECT OPERATIONS AND GENERATION

SCE is not proposing changes to generation under the existing license. The Project will continue to operate in compliance with regulatory requirements, agreements, and water rights to generate power.

Operations and generation measures are described more fully in the proposed Lee Vining Resource Management Plan (Attachment 3).

SCE is proposing minor adjustments to Project operations, specifically MIFs from Saddlebag and Tioga lakes, to support implementation of protection, mitigation, and enhancement (PME) measures proposed in the FLA. The proposed adjusted MIFs are considered an enhancement and would increase flows in spring to benefit sediment transport and ecological health for fish and aquatic invertebrates. Studies undertaken for Project relicensing did not identify significant adverse Project effects from the proposed modifications (see the Final Technical Reports in Volume III of the FLA). Proposed MIFs vary depending on the water year type and time of year, as described in Section 3.5.2 (Water Management) below. Operations and generation measures are described more in the proposed Resource Management Plan (Attachment 3, Protection, Mitigation, and Enhancement Measures).

The peak flows from Saddlebag Lake, in wet and normal water year types, would become available as soon as the SCE operations team can access the valve. The peak flow would occur for 1 week, then a recession flow would follow in two steps, each being 1 week in duration. Minimum flows would be reduced in late summer, fall, and winter.

The proposed flows from Tioga Lake would allow for a slower filling of the lake in wet and normal water year types. The valve would be opened in early or mid-June as soon as SCE operations can access the valve. The flows would release a more natural inflow. The water surface elevation of Tioga Lake would be maintained from July 1 through September 30, which is the majority of the recreation season. For consistency with the 1933 Sales Agreement between the Southern Sierras Power Company (predecessor to SCE) and Los Angeles Department of Water and Power (1933 Sales Agreement), operations in the fall would continue as normal to drain the reservoir.

3.1.4. PROJECT MAINTENANCE

SCE is not proposing changes in Project maintenance as part of the new license. The new license would include routine maintenance of mechanical and structural elements, such as low-level outlets, gates, and intakes. All activities are also subject to best management practices to prevent sediment-laden runoff or pollutants from reaching waterways or other bodies of water. Proposed O&M activities are described in detail in the proposed Lee Vining Resource Management Plan (Attachment 3).

3.1.4.1. New or Modified Environmental Measures, Management and Monitoring Plans, and Programs

SCE is proposing PME measures for the relicensing of the Project. Of those, one PME measure is germane to the continued existence of the Sierra Nevada bighorn sheep, Yosemite toad, and whitebark pine, PME-3: Lee Vining Resources Management Plan, which includes avoidance measures for general wildlife and rare, threatened, and endangered species (Attachment 3).

3.2. AUTHORITIES

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.

3.2.1. 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.

3.2.1.1. 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 the INF. FERC will solicit FPA Section 4(e) conditions from USFS after the FLA is filed.

3.2.1.2. 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 PME 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.

3.2.1.3. 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.

3.2.2. 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 SWRCB was designated by the U.S. Environmental Protection Agency 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.

3.2.3. ENDANGERED SPECIES ACT

Section 7 of the federal 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 USFWS and National Marine Fisheries Service under Section 7 of the ESA on October 8, 2021. On that same date, FERC 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 Section 7 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 FLA Exhibit E, Section 6.09, *Rare, Threatened, and Endangered Species*.

3.2.4. MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT

The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) requires federal agencies to consult with the 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 (National Oceanic and Atmospheric Administration, 2023) and determined that relicensing the Project, as proposed by SCE, will not adversely affect designated EFH.

3.2.5. NATIONAL HISTORIC PRESERVATION ACT

Section 106 of the National Historic Preservation Act (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 National Historic Preservation Act (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, 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. On that same date, FERC 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. By letter dated March 23, 2022, the SHPO pursuant to 36 CFR § 800.4(a)(1), found the area of potential effects as defined to be sufficient for the undertaking.

Discussion of potential Project effects on historic properties is provided in FLA Exhibit E, Section 6.13, *Cultural Resources*, and Section 6.14, *Tribal Resources*. SCE anticipates that to meet the requirements of Section 106, FERC will execute a Programmatic Agreement under the new license (issued by FERC) for the protection of historic properties. SCE intends to file a Draft Historic Properties Management Plan concurrent with its filing of the FLA.

3.2.6. 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 INF land management plan (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 land management plan 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 INF, 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.

¹ 36 CFR 219.7(c)(2)(vi)

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).

3.2.7. 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. SCE has maintained a list of names and addresses of federal, state, and interstate resource agencies, Native American Tribes, non-governmental organizations, and individual, unaffiliated members of the public with which SCE consulted in preparation of the FLA.

3.3. PROJECT LOCATION

The Project is located 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 unincorporated community of Lee Vining in Mono County, California (see Exhibit 2). The Project reservoirs include Saddlebag Lake, Tioga Lake, and Ellery Lake, which are all connected by Lee Vining Creek and Glacier Creek. Ellery Lake is the lowest elevation Project reservoir at 9,500 feet above mean sea level (amsl), and Saddlebag Lake is the uppermost Project reservoir at approximately 10,000 feet amsl. Detailed information about the regional context, topography, and habitat within and adjacent to the Action Area (including site photographs) is in Section 4.0, Environmental Baseline.

The current FERC Project Boundary overlaps with designated critical habitat for Yosemite toad and Sierra Nevada bighorn sheep. Detailed descriptions of critical habitat and the physical or biological features essential to the conservation of the species (hereafter referred to as "primary constituent elements" and abbreviated as "PCEs") are in Section 4.0, Environmental Baseline. There is no designated critical habitat for whitebark pine.

3.4. CONSTRUCTION ACTIVITIES

No construction activities are planned associated with the relicensing of the Project.

3.5. PROPOSED FEDERAL ACTION

The Action is the issuance of the new license and the ensuing activities that would result from that license. Those activities, including the Project's O&M activities, are described in this section.

The powerhouse is automatically controlled from the SCE 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 reservoirs are manually operated and adjusted for minimum flow requirements and water 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.

The Project is operated in compliance with existing regulatory requirements, agreements, and water rights to generate power. The following section describes how the Project manages water in compliance with its current FERC license and water delivery agreements to support its operations, and how inspections and maintenance of Project facilities are carried out. SCE does not propose any changes to the way the Project is maintained. Minimal changes to MIFs have been proposed by SCE to benefit sediment transport and ecological health.

3.5.1. ACTION AREA

The Action Area to be analyzed herein includes the relevant features and facilities from the existing FERC Project Boundary and incorporates the FERC Project Boundary changes proposed as part of the Proposed Action. The Action Area (proposed FERC Project Boundary) includes 542.25 acres of land, which is 73.25 acres smaller than the existing FERC Project Boundary. The Action Area includes 535.99 acres (98.8 percent) of federally owned lands administered by the USFS and 6.26 acres (1.2 percent) of SCE-owned land and encompasses all the Project facilities and features described in Section 3.1.1.1, FERC Project Boundary Modifications.

3.5.2. WATER MANAGEMENT

Releases and spills from both Saddlebag and Tioga lakes flow 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 runoff, in accordance with the 1933 Sales Agreement.

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 flowline and penstock. Minimum flows are provided into Lee Vining Creek below Poole Powerhouse.

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. Project operations must be consistent with the 1933 Sales Agreement, requiring the reservoirs to be drawn down overwinter each year. Once water has left the FERC Action Area, SCE has no control over downstream diversions.

While complying with the 1933 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. Currently, minimum flow requirements are different below each dam. Under the current license, minimum downstream 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 30th percentile of the previous years, back to 1966. A “normal” water year is when the annual precipitation is neither wet nor dry. A water year is “dry” when the precipitation is in the lowest 30th percentile of the previous years, back to 1966.

SCE is proposing to modify how water year types are defined. Water year type is to be calculated with precipitation data from the previous 30 years measured at the Dana Meadows snow course as opposed to looking as far back as 1966. Water Year Type definitions are described below:

- Dry years are defined as those in which the water availability as of April 1 is representative of the water available on April 1 in the lowest 30th percentile of the previous 30 years.
- Wet years are defined as those in which the water availability as of April 1 is representative of the water available on April 1 in the highest 30th percentile of the previous 30 years.
- Normal years are defined as those that cannot be classified as either dry or wet years, per the above definitions.

3.5.2.1. Saddlebag Dam

Currently, below Saddlebag Dam, the flow requirements are determined annually in consultation with the USFS no later than May 1 of each calendar year. If SCE and the USFS do not agree on flows, the following minimums apply year-round (78 FERC ¶ 61,110 [1997], Order Issuing New License):

- Wet years: 14 cubic feet per second (cfs)
- Normal years: 9 cfs
- Dry years: 6 cfs

SCE is proposing to modify its MIFs below Saddlebag Dam (Table 3.5-1).

Table 3.5-1. Minimum Instream Flows below Saddlebag Dam

Water Year Type	MIFs (cfs)	Timing/Duration ^a
Wet	30	Week 1, for 1 week
	22	Week 2, for 1 week
	16	Week 3, for 1 week
	9	Remainder of the year (late summer and over-winter flows)

Water Year Type	MIFs (cfs)	Timing/Duration ^a
Normal	20	Week 1, for 1 week
	14	Week 2, for 1 week
	10	Week 3, for 1 week
	6	Remainder of the year (late summer and over-winter flows)
Dry	4	Year-round

MIF = minimum instream flow

^a Beginning June 1, or as soon as access allows.

3.5.2.2. Tioga Dam

Currently, 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 runoff.

- May through September:
 - o In a wet or normal water year, if the inflow is less than 2 cfs, the downstream flow requirement is equal to the inflow and cannot exceed 2 cfs. If the inflow is greater than 2 cfs, the downstream 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 downstream flow becomes greater than 60 percent of the inflow.
 - o In a dry water year, if the inflow is less than 2 cfs, the downstream flow requirement is equal to the inflow and cannot exceed 2 cfs. If the inflow is greater than 2 cfs, the downstream 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 downstream flow becomes equal to the natural inflow.
- October and November: the minimum downstream flow is 2 cfs or the natural inflow.
- December through April: the minimum downstream flow is equal to the natural inflow.

SCE is also proposing to modify MIFs below Tioga Dam; the downstream flow requirements are different depending on the month, the water year, and the amount of inflow. Consistent with the No Action Alternative, the reservoir is kept low in the winter in preparation for spring runoff and in adherence to the 1933 Sales Agreement. The MIF 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 minimum flows in Table 3.5-2 apply.

Table 3.5-2. Minimum Instream Flows Below Tioga Dam

Water Year Type	MIFs (cfs)	Date/Duration
Wet	10	2 weeks ^a
	2	Until October 29
	5	October 30 ^b
Normal	5	2 weeks ^a
	2	Until October 29
	5	October 30 ^b
Dry	2	June 1 ^a until October 29
	5	October 30 ^b

MIF = minimum instream flow

^a Beginning June 1, or as soon as accessible. Subsequent flow changes shall occur in succession.

^b October 30 flows will remain at 5 cfs through drawdown, at which time outflow may equal inflow.

3.5.2.3. Poole Powerhouse

Currently, below Poole Powerhouse, the minimum flow requirement is 27 cfs or the natural flow, whichever is less, between August and May. In June and July, the minimum flow is 89 cfs or the natural flow, whichever is less. Flows are measured by an acoustic velocity meter 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 current 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.

SCE does not propose to make any changes to the current minimum flow requirements below Poole Powerhouse.

3.5.3. INSPECTIONS AND MAINTENANCE

Routine inspections and maintenance activities are conducted at Project facilities to verify the structural and/or functional integrity of the facilities, identify conditions that might disrupt operations or threaten public safety, and maintain the facilities in safe and operational conditions. These activities are described in further detail in the attached Resource Management Plan (Attachment 3).

Routine inspections are conducted by an operator 4 to 5 days per week at Project facilities to verify the structural and/or functional integrity of the facilities and identify conditions that might disrupt operations or threaten public safety. During spring and summer peak runoff conditions, routine inspections occur daily. Monthly spill prevention, control, and countermeasure inspections, as well as switchyard inspections, also occur. Weekly and monthly inspections occur outside of peak runoff, while hydrographers perform weekly

inspections of Saddlebag Dam in summer months. Monthly inspections occur at all dams year-round; however, there is limited visibility in winter months.

Maintenance work is conducted as needed throughout the year. Trash rack grids are raked to ensure they are clean and free of debris. Minor concrete repairs and spalling is fixed as needed. Other normal maintenance includes snow removal and emergency repairs to the generator and associated equipment as needed. Routine O&M activities include minor road and trail maintenance; transmission, power, and communication line maintenance; maintenance outages; powerhouse inspections and maintenance; and flowline inspections and maintenance.

SCE does not propose any changes to the way the Project is maintained.

3.5.3.1. Facilities Repair

SCE routinely makes repairs to structures and facilities and conducts maintenance to retain the functional and structural integrity of the Project facilities. Facilities include gaging stations and flumes, intakes and diversion structures, and flow meters. Within these facilities, maintenance and repairs may occur on gates, barricades, small structures (e.g., gaging stations and storage facilities), streambanks, and diversions. Major categories of facilities include the following:

- Measuring stations and flumes. SCE uses measuring stations and flumes to measure water in the waterways. Maintenance work related to gaging stations and flumes include mowing vegetation to provide access along channel banks and removing stream deposit within an area of measuring stations to allow unobstructed water flow and the accurate reading of water flow in waterways.
- Intake and diversion structures. SCE uses intake and diversion structures to divert water from a stream or canal. Stream deposits (accumulated sediment and woody debris) are removed above and/or below intake structures as needed.
- Gate inspection and maintenance. This may include the operation of intake drain gates, sand traps, and chamber drain gates. These routine operations do not result in draining of any ponds, which minimizes effects on the stream. SCE is required to inspect penstocks, which does involve lowering the ponds to expose the entry point to the penstock.

3.5.3.2. Maintenance Outage

SCE conducts annual maintenance outages at the Poole Powerhouse to support minor maintenance and repair any wear and tear, typically during low-flow periods (fall). The maintenance outage typically lasts for 1 to 3 weeks. During the outage, SCE conducts mechanical and electrical inspections and maintenance of powerhouse appurtenances. In conjunction with the maintenance outage, SCE also makes minor repairs (e.g., trash rack grid raking, spillway debris removal, concrete spalling/repairs, handrail repairs) to the dams, as appropriate.

SCE conducts physical inspections of the flowline/penstock every quarter.

3.5.3.3. Distribution, Power, and Communication Line Maintenance

The Project includes a switchyard immediately adjacent to the Poole Powerhouse. This short connection is maintained by Project personnel.

3.5.3.4. Road Grading and Maintenance

Access roads to Project dams are inspected during normal Project activities. Repairs and maintenance are typically conducted in the spring, following the rainy winter season, and as needed throughout the summer and fall. Maintenance activities include filling potholes, grading the road prism, adding gravel to address instances of washout, mowing grass, and light brushing.

3.5.4. POST-CONSTRUCTION MAINTENANCE

As noted in Section 3.5, Proposed Federal Action, no new construction would occur under the Proposed Action, only the revised MIFs as described above. No additional monitoring is proposed with the revised MIFs.

3.5.5. CONSTRUCTION SEQUENCING AND SCHEDULE

Project maintenance activities would continue as currently implemented. No new construction is proposed.

3.5.6. PROPOSED AVOIDANCE, MINIMIZATION, MITIGATION, AND CONSERVATION MEASURES

This section describes the proposed protection measures to be implemented by SCE under the new license. The proposed protection measures identify measures to avoid and minimize adverse effects to Sierra Nevada bighorn sheep, Yosemite toad, and whitebark pine in the Action Area.

3.5.6.1. Sierra Nevada Bighorn Sheep

In the unlikely scenario that Sierra Nevada bighorn sheep occur on or adjacent to an O&M activity area, then no SCE personnel shall approach any sheep, and no Project O&M activities shall occur until the Sierra Nevada bighorn sheep leave the area.

3.5.6.2. Yosemite Toad

The proposed protection measures identified below are intended to avoid and minimize potential adverse effects to Yosemite toad in the Action Area from Project O&M activities.

1. SCE will provide annual training to ensure workers are aware of the locations, life history, identification of, and life stages of the Yosemite toad in the Lee Vining FERC Project Boundary and surrounding areas of potential dispersal.

2. SCE will create maps with clearly delineated locations of known Yosemite toad populations, breeding sites, and terrestrial dispersal areas that contain the physical or biological features essential to the conservation of Yosemite toad for inclusion in annual training. These maps will include a 50-foot buffer.
3. SCE typically performs maintenance from spring snowmelt to fall snow closure (generally from June to November). The timing of early spring snowmelt dictates site access in the spring, and the heavy snow in the late fall closes Tioga Pass, preventing access over winter. Currently, all known and observed population sites and breeding locations are outside of the FERC Project Boundary and are outside of the routine O&M areas. Dispersing adult toads could cross into maintenance areas inside the FERC Boundary. Should a Yosemite toad be observed, SCE crews will follow the direction provided in Item 4 below.
4. Should a Yosemite toad be observed during the course of routine O&M, crews will stop work until the Yosemite toad leaves the work area. Crews will immediately call the SCE Environmental Manager and Senior Production Supervisor to notify them of the observation. The SCE Environmental Manager will determine if a qualified biologist is needed to monitor the work and the Yosemite toad. The Senior Production Supervisor will determine if the work can be postponed until the site is clear of Yosemite toad.
5. SCE will be allowed to conduct emergency work activities and notify the USFWS after the fact to determine next steps. SCE will engage a qualified biologist to monitor emergency work in areas known to support Yosemite toad or likely dispersal areas.

3.5.6.3. Whitebark Pine

The following proposed protection measures are intended to avoid and minimize potential adverse effects to whitebark pine in the Action Area from Project O&M activities.

1. SCE will provide annual training to make workers aware of the locations and identification of whitebark pine and its cones (or any other five-needle pine species²) in the Lee Vining FERC Project Boundary. Due to the difficulty in identifying to species, any five-needle pines found in the FERC Boundary need to be avoided.
2. SCE will create maps with clearly delineated known locations of whitebark pine within routine O&M areas.
3. For routine O&M work within the FERC Boundary in areas of known whitebark pine, SCE crews will use existing roads and trails to access work areas. SCE will assign a biologist to survey the work area for whitebark pine trees, cones, and

² Species of five-needle pine that could co-occur with whitebark pine near the Project include sugar pine (*Pinus lambertiana*), foxtail pine (*Pinus balfouriana*), western white pine (*Pinus monticola*), and limber pine (*Pinus flexilis*).

seedlings and flag off areas as “no work zones” with bright-colored flagging or cones. The biologist will monitor the activity to prevent impacts to whitebark pine.

4. For routine O&M work outside of the FERC Boundary, SCE will have a biologist survey the work area for whitebark pine trees, cones, and seedlings and flag areas prior to work beginning. The biologist will monitor the routine O&M activities to prevent impacts to whitebark pine.
5. For work near known whitebark pine locations, the qualified biologist will also determine the location of whitebark pine seed banks and, if located, flag the seed bank for avoidance and monitor the activity to prevent impacts to whitebark pine seed banks.
6. SCE crews will only stage equipment, vehicle parking, or placement of other heavy equipment on pavement or existing roadway to avoid the root zone of whitebark pines.
7. Maintenance and refueling of vehicles and equipment will only occur on paved areas or existing roadways.
8. When performing any ground disturbance work within 50 feet of known whitebark pine or any five-needle pine, SCE will demarcate a “no work zone” around the pines and their root zones with bright-colored flagging or cones. See Items 3 and 4 above.
9. Ground disturbing activities require additional FERC approval; these activities would be evaluated on a project-by-project basis for impacts to whitebark pine seed banks.
10. Personnel will not collect or walk on whitebark pine cones and will leave all whitebark cones in place.
11. Personnel will not remove or trim five-needle pine trees in or near whitebark pine locations without identifying the tree to species.

4.0 ENVIRONMENTAL BASELINE

4.1. TOPOGRAPHY

The Project lies within the Cascade-Sierra Mountains physiographic province, which has been sculpted by glaciers and is characterized by rounded granite outcrops, U-shaped valleys, glacial lakes within glacial till deposits, and talus slopes (FERC, 1992). Within the Mono Basin, elevations range from over 13,000 feet (3,960 meters) amsl along the Sierra Nevada peaks to approximately 6,400 feet (1,950 meters) amsl at the shoreline of Mono Lake (Millar and Woolfenden, 1999), with the basin floor generally below 7,000 feet (2,130 meters) (Vorster, 1985). See Exhibit 6, Mono Basin Topographic Map.

There are three Project reservoirs including Saddlebag Lake, Tioga Lake, and Ellery Lake. Saddlebag Lake lies within a glacially carved U-shaped valley. Steep, 1,200-foot (365 meter) ridges bound the lake on the east and west sides, and talus slopes form most of the rock shoreline (FERC, 1992). Tioga Lake lies in a valley on glacial till with a scattering of rounded rock outcrops (FERC, 1992). Ellery Lake has a rocky shoreline with several areas of talus slopes entering the lake from the steep terrain along the southern margin.

4.2. VEGETATION TYPES

Five vegetation communities and two other land cover areas were identified in 2022 during the botanical survey conducted for the Project: alpine grasses and forbs, barren, conifer forest, developed, wet meadow, water, and willow scrub. The General Botanical Resources Survey was conducted in 2022 and 2023 (Attachment 2). The mapped vegetation types are shown on Exhibit 7, Vegetation Map.

- **Alpine Grasses and Forbs.** Alpine grasses and forbs occur in relatively xeric, open areas. This vegetation type consists of a variety of native and non-native annual and perennial grasses and forbs, with few scattered shrubs or trees. 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*).
- **Barren.** Barren areas consist of generally unvegetated portions of the study area. This includes areas without soil development (e.g., exposed bedrock, cliff, and scree slopes), areas of bare soil (e.g., fluctuating lakeshore that is periodically inundated and exposed), and graded areas (e.g., dirt roads and turnouts). These areas may contain sparse, scattered vegetation.
- **Conifer Forest.** Conifer forest occurs on slopes and flat areas. This vegetation type consists of a tree canopy containing a variety of conifer species; the species composition varies with some areas containing a single dominant species while other areas contain a mix of species. Tree species primarily include lodgepole pine (*Pinus contorta* ssp. *murrayana*), whitebark pine (*Pinus albicaulis*), and Jeffrey pine (*Pinus jeffreyi*); white fir (*Abies concolor*) occurs in some areas. The understory varies and may include sagebrush sedge (*Carex filifolia* var. *erostrata*), fireweed (*Chamerion angustifolium* ssp. *circumvagum*), western prickly gooseberry (*Ribes montigenum*), northern goldenrod (*Solidago multiradiata*), and Fendler's meadow-rue (*Thalictrum fendleri*).
- **Developed.** Developed areas are unvegetated and consist of buildings, paved roads, and parking lots.

- **Wet Meadow.** Wet meadow occurs in mesic areas. 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*). Co-occurring species vary and may include ranger's button (*Angelica capitellata*), Sierra gentian (*Gentianopsis holopetala*), alpine shooting star (*Primula tetrandra*), and Pacific onion (*Allium validum*). Some areas may contain scattered shrubs or trees.
- **Water.** Open water occurs in the reservoirs, lakes, and ponds in the study area. It is also present in the flowing streams. Where water is clearly visible along the main channel of Lee Vining Creek in aerial imagery, it is mapped. However, most secondary channels are generally too narrow to be mapped separately and are included in the adjacent vegetation type(s). The water level varies both seasonally and annually.
- **Willow Scrub.** Willow scrub occurs along drainages and mesic areas. This vegetation type is dominated by a variety of shrubby willows, including Sierra willow (*Salix eastwoodiae*), Jepson's willow (*Salix jepsonii*), and gray-leaved willow (*Salix orestera*). Willow cover may be quite dense. Co-occurring species vary and may include fireweed (*Chamerion angustifolium* ssp. *circumvagum*), shrubby cinquefoil (*Dasiphora fruticosa*), Wood's rose (*Rosa woodsia*), Pacific onion (*Allium validum*), and willowherb (*Epilobium* spp.).

4.3. LEE VINING CREEK

Lee Vining Creek drains the eastern Sierra Nevada crest, and Glacier Creek is a tributary 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 rim the watershed boundary (Jones & Stokes Associates, 1993). Lee Vining Creek drops precipitously down the eastern Sierra escarpment from Ellery Lake, at elevation 9,500 feet amsl, to Poole Powerhouse, at elevation 7,825 feet amsl (Jones & Stokes Associates, 1993).

The 1992 Final Environmental Assessment (FERC, 1992) for the Project describes Upper Lee Vining Creek as having three distinct stream reaches differentiated by habitat and channel morphology between Saddlebag Dam and Ellery Lake (Exhibit 8, Upper Lee Vining Creek Sections):

- **Upper Lee Vining Creek, Section 1, 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 (~85 percent riffle, ~10 percent cascade). The channel is relatively broad and shallow for its gradient and substrate composition and includes a stretch of rock piles that were historically placed to create a straight ditch-type feature before moving to a microhabitat with a meadow at a lower elevation. Under the current flow regime, the riparian community remains healthy, but drought episodes will likely continue to impact Project operations and riparian health, specifically herbaceous species (Read, 2022).
- **Upper Lee Vining Creek, Section 2, 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.

- **Upper Lee Vining Creek, Section 3, 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.

Of the three sections of Upper Lee Vining Creek, the section below Glacier Creek (Section 3, Glacier Creek to Ellery Lake) does not support habitat or populations of Yosemite toad.

Lower Lee Vining Creek below Poole Powerhouse alternates between areas of shallow pools and short sections of steeper gradients containing riffles. The substrate downstream of Poole Powerhouse is primarily cobble with sand prevalent in areas of reduced gradient (FERC, 1992). This section does not support suitable habitat or populations of Yosemite toad.

4.3.1. AQUATIC HABITAT

The following discussion is summarized from Salamunovich (2021); the Water Quality (FLA Exhibit E, Section 6.4) and Fish and Aquatics (FLA Exhibit E, Section 6.5); and the Aquatic Habitat Mapping and Sediment Characterization (AQ-3) Final Technical Report in Volume III of the FLA.

As part of the conditions of the existing license, aquatic habitat surveys in Upper Lee Vining Creek were conducted seasonally (spring, summer, and fall) from 1999 through 2001, and then only in the fall of every fifth year, including 2006, 2011, and 2016 (Sada, 2003, 2007; Sada and Rosamond, 2011; Salamunovich, 2017). The most recent aquatic habitat survey was conducted by Salamunovich in 2021. The aquatic habitat study area is located downstream of Saddlebag Dam just upstream of Slate Creek. Discharge through this part of Lee Vining Creek is regulated by releases from Saddlebag Dam, which is located about 0.5 miles upstream. Flows are generally stable through the study area and are maintained by controlled dam releases except during infrequent spills from Saddlebag Lake.

The results of the 2021 aquatic habitat survey suggest Upper Lee Vining Creek provides a healthy stream channel that can sustain instream and riparian resources. The survey suggests this small, regulated headwater stream has attributes that can support resident trout, including adequate base flows, ample instream and overhead cover, undercut banks, canopy shading, well-mixed water conditions (as indicated by the turbulence noted throughout all study reaches), and availability of gravels for spawning, as indicated by the high percentages of gravels at most of the monitoring transects.

Recent aquatic habitat surveys in support of the Lee Vining Relicensing (Attachment 2) provide descriptions of Lee Vining Creek and its aquatic habitats. These descriptions are consistent with those from previous studies, demonstrating a consistent aquatic environment along Lee Vining Creek.

Water quality information discussed in this section includes data collected during the 2022 and 2023 water quality assessment (WQ-1 Final Technical Report, provided in Volume III of Exhibit E of the FLA) and other available and relevant historical data (Cohen, 2019; Lund, 1988; California Environmental Data Exchange Network, 2024; Salamunovich, 2017). Various water quality parameters were measured, not all of which are associated with success suitability for Yosemite toad. For instance, mercury and bacteria loads were measured in conjunction with studies relative to public health (i.e., human consumption of fish from these systems). Collectively, the parameters measured include water temperature, dissolved oxygen (DO), conductivity, pH, nutrients, total dissolved solids, and total suspended solids, turbidity, bacteria, and mercury.

Table 4.3-1 summarizes the water quality data collected in 2022 and 2023 that can be associated with Yosemite toad habitat suitability: temperature, DO, conductivity, pH, and turbidity. The locations of importance to this analysis of existing conditions for Yosemite toad are in bold. The other areas are left in the table for context.

Table 4.3-1. 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
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

Location (Site ID)	Waterbody	Temperature (°C)	DO (% sat.)	DO (mg/L)	Specific Conductance (µS/cm)	pH (s.u.)	Turbidity (NTU)
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; DO = Dissolved Oxygen; % sat. = percent saturation; mg/L = milligrams per liter; µS/cm = micro Siemens per centimeter; ID = identification number; s.u. = standard units; NTU = nephelometric turbidity units; LAWDAP = Los Angeles Department of Water and Power.

The reported data in Table 3.5-2 are in agreement with the findings of Salamunovich (2021). The aquatic habitat is a healthy system that has supported healthy populations of Yosemite toads in the past and can continue to support healthy populations of Yosemite toads into the future.

Currently, the ongoing SCE operations, as related to water management, are maintaining the aquatic habitat and adjacent riparian and upland habitat along Lee Vining Creek and the Saddlebag and Tioga lake shores, as they have for the past 100 plus years.

Fluctuations in water levels in Saddlebag Lake and flows in Upper Lee Vining Creek are mandated by the license and by water year. Since 1999, the results of the riparian monitoring have demonstrated that even with the fluctuations in flows, the riparian and creek aquatic habitats have remained relatively constant providing suitable habitat for Yosemite toad.

4.3.2. RIPARIAN HABITAT UPPER LEE VINING CREEK

SCE conducted regular riparian and aquatic monitoring as part of the existing license, beginning with baseline surveys conducted in 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 between Saddlebag Lake and the confluence of Slate Creek for the license-required riparian monitoring. These sites were chosen because they have the least confounding influence of other hydrologic inputs other than Saddlebag Lake. In addition to monitoring riparian vegetation, geomorphology parameters were also 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). Additionally, Read (2022) reported a stable riparian vegetation community; with some variability between years, but based on the data this variability is due to climate-related factors, especially drought, and is not attributed to Project operations.

Although this monitoring did not cover the entirety of Upper Lee Vining Creek, SCE assumes these conclusions can be extended to the remainder of Upper Lee Vining Creek based on observations made during the Yosemite toad surveys. In addition, a Normalized Difference Vegetation Index study conducted for the relicensing compared sites along Upper Lee Vining Creek and found no appreciable differences in vegetation between sites.

4.4. SADDLEBAG LAKE

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 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 runoff. Saddlebag Lake is 297 acres, which has a net storage capacity of 9,765 acre-feet (SCE, 2025). 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, 2025). Saddlebag Dam is in a narrow channel between rock outcrops (FERC, 1992).

Most of the lake shore surrounding Saddlebag Lake consists of a barren rocky shoreline. At the north inlet to Saddlebag Lake, there is a series of wet meadows and willow scrub habitat between Saddlebag Lake and Greenstone Lake that provides suitable habitat for Yosemite toad.

At the southern end of Saddlebag Lake, there is a small complex of wet meadows and willow scrub habitats well known to support a population of Yosemite toad (CDFW, 2020). This area is surrounded by suitable upland habitat.

4.5. TIOGA LAKE

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).

Tioga Lake is fed water by several sources. Perennial water flow enters the lake from the south (draining Tioga Pass) and from the southeast (draining the Dana Lake area). Additional inflow includes runoff from the adjacent slopes to the east and west; however, considerably less water enters the lake from these sources. Potentially suitable breeding habitat along the margins of Tioga Lake was generally concentrated around these inflow areas. The wet meadows associated with the smaller eastern and western inflows supported some temporary, potentially suitable breeding habitat. The water flow originating from Tioga Pass was more channelized and did not create meadow habitat along the Tioga Lake margins; however, topography approximately 131 feet (40 meters) upstream of Tioga Lake supported a meadow with potential breeding habitat. Water flow draining the Dana Lake area was also substantial and mostly channelized; however, the topography along the Tioga Lake margins fans out and supports a wide, shallow meadow area fed by channel overflow and partially supported by peak water levels within Tioga Lake. This area is also a potential breeding habitat.

4.6. ONGOING NON-PROJECT ACTIVITIES: RECREATION

Project activities associated with the existing license have been ongoing for more than 30 years, including O&M activities described in Section 3.5 (Proposed Federal Action)

above. The current Project license does not include recreational facilities or any related recreation resource management plan. The USFS manages recreation facilities and facilitates recreation use and activities in the INF. In 2014, the USFS and USFWS signed a Biological Opinion included measures addressing USFS recreation resources to implement to protect the Yosemite toad (USFWS, 2017). Non-Project recreation facilities and activities, summarized in the following Sections 4.6.1 (Camping and Day-Use Areas) through 4.6.5 (Climbing), are available for public use within the vicinity of and adjacent to the Action Area. No recreational facilities occur within the Action Area.

4.6.1. CAMPING AND DAY-USE AREAS

The Mono Lake Ranger District of the INF operates and maintains recreational facilities and opportunities within Upper Lee Vining Canyon, providing 6 public campgrounds with approximately 79 camping units in the upper canyon, one of which is a group unit accommodating up to 25 guests, as summarized in Table 4.6-1 (USFS, 2020a). Other developed recreation sites include Saddlebag Day Use Area, Tioga Lake Overlook information site, and eight trailheads. 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/or State Route 120 (also called Tioga Pass Road).

Table 4.6-1. 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, 2020a

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. Campgrounds were open for a limited season in the summer of 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.

4.6.2. 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 INF in the Upper Lee Vining Canyon, many of which are adjacent to the existing FERC Project Boundary (USFS, 2018). Many of these trails provide access to lakes, ponds, or river fishing; or access that leads to backpacking opportunities in the Hoover and Ansel Adams Wilderness areas.

Overnight wilderness permits are available for overnight backpacking originating from the INF's Saddlebag Lake and Glacier Canyon Trailheads, which provide access to the Hoover and Ansel Adams Wildernesses, respectively. The INF 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 do not account for the day use certain wilderness trails receive from other hikers and anglers, so the INF 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 INF 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.

A dispersed use recreation assessment was conducted in 2022 at each of the Project reservoirs as part of the Project relicensing effort. Dispersed recreation trails were identified at both Saddlebag and Tioga lakes within proximity of Yosemite toad habitat. A total of 7,047 linear feet of trails were identified on the north and south ends of Saddlebag Lake, and a total of 9,923 linear feet of trails were identified around Tioga Lake.

In 2024, as part of the Project relicensing effort, six trail counters were installed at various recreation facilities in the Upper Lee Vining Canyon. These trail counters recorded the number of recreationists using the trails on an hourly basis; the daily total number of people was calculated from the hourly counts. Three trail counters were placed at the south end of Saddlebag Lake (Trail East 1 & 2, Trail West) with one trail counter placed on the west side of Tioga Lake, between the lake and Highway 120.

The Saddlebag Lake Trail West trail counter identified a total of 14,864 people who used the trail in the June through October 2024 survey period. Peak visitor months were July (4,838 visitors counted), August (4,340 visitors), and September (3,1240), with 1,353 visitors in October and 1,209 visitors in June.

The Saddlebag Lake Trail East trail counter identified a total of 13,774 people who used the trail in the June through October 2024 survey period. Peak visitor months were July (4,535 visitors counted), August (3,717 visitors), and September (2,441), with 1,935 visitors in June and 1,146 visitors in October.

The Saddlebag Lake Trail East 2 trail counter identified a total of 11,730 people who used the trail in the June through October 2024 survey period. Peak visitor months were July (3,702 visitors counted), August (2,832), and September (2,273 visitors), with 1,545 visitors in October and 1,378 visitors in June.

4.6.3. 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, including all three Project reservoirs and the portion of Lee Vining Creek between Saddlebag and Ellery lakes. 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.

4.6.4. BOATING

The only boating resources in the Upper Lee Vining Canyon are operated by the Saddlebag Lake Resort, a concessionaire of the INF, 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.

4.6.5. 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 (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).

4.7. STATUS OF THE SPECIES WITHIN THE ACTION AREA

4.7.1. SIERRA NEVADA BIGHORN SHEEP

Two federally listed wildlife species occur adjacent to the Action Area: Sierra Nevada bighorn sheep and Yosemite toad. The information presented below is a result of literature review, field surveys, and agency consultation.

Sierra Nevada bighorn sheep are not permanent occupants of the Action Area as defined for this BA. As stated earlier, the Action Area is located between the territory of the Mt. Gibbs herd and the Mt. Warren herd. The Action Area appears to be an area used

occasionally when individuals of either herd come down from the higher elevations to utilize the available resources.

4.7.1.1. Survey Methods

No direct surveys for Sierra Nevada bighorn sheep were conducted for relicensing the Project. The Sierra Nevada bighorn sheep were not expected to be a regularly occurring species in the Action Area. However, biologists are aware Sierra Nevada bighorn sheep may be present as transients during terrestrial wildlife survey visits.

The General Wildlife Resources Survey (TERR-2) Study Plan details the study area (inclusive of the Action Area and surroundings), methods, and schedule for the study objectives identified for terrestrial wildlife (Attachment 1). In summary, multiple terrestrial survey visits were performed by Psomas biologists: the survey dates are described in Section 4.7.2.5, Visual Encounter Surveys. Although each survey visit was performed with the purpose of documenting specific target wildlife species identified in the Project's Terrestrial Wildlife Study Plan (e.g., visual encounter surveys for Yosemite toad), all non-target wildlife species or evidence of the species (e.g., Sierra Nevada bighorn sheep) observed during each survey visit were recorded in field notes or onto electronic tablet devices.

4.7.1.2. Literature Review

Psomas reviewed the available literature for information on Sierra Nevada bighorn sheep preferred habitat, life history, and tracked populations in the Action Area and greater vicinity. The primary sources are listed below; however, the References section of this BA includes the additional literature and databases reviewed.

- 2007 Recovery Plan for the Sierra Nevada Bighorn Sheep (USFWS, 2007);
- 2000 (January 3) Final Rule to List the Sierra Nevada Distinct Population Segment of the California Bighorn Sheep as Endangered (USFWS, 2000);
- 2008 (August 5) Designation of Critical Habitat for the Sierra Nevada Bighorn Sheep (*Ovis canadensis sierrae*) and Taxonomic Revision (USFWS, 2008); and
- Most recent bighorn sheep herd location data (CDFW, 2025).

4.7.1.3. Agency Consultation

In addition to coordinating with CDFW and USFWS during the Terrestrial Wildlife TWG meetings for all relevant special status wildlife, Psomas coordinated with CDFW to obtain the most recent data on the localities currently utilized by the herds of Sierra Nevada bighorn sheep monitored by CDFW.

4.7.1.4. Field Survey Results

During the field surveys performed for the Proposed Action, Sierra Nevada bighorn sheep scat was observed incidentally in two locations outside the Action Area during the pedestrian portion of the wildlife surveys: approximately 100 feet east of Tioga Lake and along Saddlebag Lake Road approximately 500 feet northeast of Sawmill Campground.

No surveys were conducted at the higher elevations, where Sierra Nevada bighorn sheep would be expected to occur because these areas are well outside of the Action Area and are also well outside of SCE's area of O&M sphere of influence.

4.7.1.5. Overall Status and Threats

In 2007, the USFWS published a recovery plan for the Sierra Nevada bighorn sheep (USFWS, 2007). CDFW is the lead agency implementing the plan. Four recovery units were established across the species range under the 2007 Sierra Nevada Bighorn Sheep Recovery Plan (USFWS, 2007). The Action Area is outside but adjacent to the Northern Recovery Unit.³ The closest herds to the Action Area (the Mt. Warren and Mt. Gibbs herds) occur within the Northern Recovery Unit.

The latest information available from CDFW's website (<https://wildlife.ca.gov/Conservation/Mammals/Bighorn-Sheep/Sierra-Nevada/Recovery-Program/Progress#current-population-update>) states the Sierra Nevada bighorn sheep herds took heavy mortality during the winters of 2022-2023. CDFW estimated a population decline of 40 percent, due to the bighorn sheep overwintering at high elevations to avoid predation, which were impacted by heavy snowfall that winter. These herds will require continued management intervention to meet their delisting and recovery goals.

Suitable habitat is present on and adjacent to the Action Area, and, because of the generally arid nature of high montane habitats, the presence of wet meadows and lakes would be expected to draw bighorn sheep into the Action Area to take advantage of these water resources. Further, evidence of the species was observed in the vicinity of Project wildlife surveys. No changes to the existing habitat within or adjacent to the Action Area are proposed as part of the Proposed Action. Further, no changes to the species' habitat in the greater vicinity of the Action Area (land owned and managed by the USFS) are anticipated (USFWS, 2016). The Action Area is also adjacent to the federally designated critical habitat for the species; specifically, the Action Area is located between Unit 1 (Mt. Warren) comprised of 36,012 acres of mostly federal lands and Unit 2 (Mt. Gibbs) comprised of 29,702 acres of all federal lands (Exhibit 1b). The local boundaries of the designated critical habitat are similar to that of CDFW's Northern Recovery Unit: adjacent on nearly each side of the Action Area. Special management considerations and protection for Unit 1 have been identified to ameliorate the threats of overgrazing; to reverse the impacts of fire suppression to provide more open habitat and potentially reduce predation; to protect against the impacts of recreation (e.g., Virginia Lakes, Lundy

³ There is a 1-acre parcel within the Mount Warren Critical Habitat Unit near Ellery Lake. This parcel is proposed to be removed from the FERC Project Boundary. See Section 3.1.1.

Lake, Lee Vining Canyon) and development activities (e.g., sections of State Highway 120 are located in this unit); and to protect against catastrophic events in the form of avalanche control (USFWS, 2008).

4.7.1.6. Listing Status

Sierra Nevada bighorn sheep was listed as an endangered species on January 3, 2000. On August 5, 2008, the USFWS published the current Final Rule designating approximately 417,577 acres of land as critical habitat for the Sierra Nevada bighorn sheep in Tuolumne, Mono, Fresno, Inyo, and Tulare counties, California (USFWS, 2008).

4.7.1.7. Description of the Species

The Sierra Nevada bighorn sheep descriptions below are taken from the final species' listing and designated critical habitat listings published in the Federal Register (USFWS, 2000; 2008) and Blood (2024).

The bighorn sheep (*Ovis canadensis*) is a large mammal in the family *Bovidae* described by Shaw in 1804. The Sierra Nevada bighorn sheep is similar in appearance to other associated bighorn sheep. The species' pelage shows a great deal of color variation, ranging from almost white to fairly dark brown, with a white rump. Males and females have permanent horns; the horns are massive and coiled in males and are smaller and not coiled in females. As the animals age, their horns become rough and scarred and will vary in color from yellowish-brown to dark brown. In comparison to many other desert bighorn sheep, the horns of the Sierra Nevada bighorn sheep are generally more divergent as they coil out from the base. Adult male sheep stand up to 3 feet (1 meter) tall at the shoulder; males and females weigh up to 220 pounds (lbs) (99 kilograms [kg] and 140 lbs (63 kg), respectively.

The Sierra Nevada bighorn sheep can run over level ground at 30 miles per hour (mph) and up mountain slopes at 15 mph. It has cloven, sharp-edged hooves that are elastic and convex with a soft, pliable inner pad. These claws allow the bighorn to easily negotiate the rocky, steep terrain of its habitat.

The primary predator of the Sierra Nevada bighorn sheep is the mountain lion.

4.7.1.8. Current Range and Distribution

Sierra Nevada bighorn sheep inhabit portions of the Sierra Nevada located along the eastern boundary of California in Tuolumne, Mono, Fresno, Inyo, and Tulare counties. Habitat occurs from the eastern base of the range as low as 4,790 feet amsl (1,460 meters) to peaks above 14,100 feet (4,300 meters). Based on recent modeling efforts, Sierra Nevada bighorn sheep habitat, as well as areas necessary to provide connectivity between winter and summer ranges, occur as low as 4,000 feet (1,219 meters) in the southern portion of its range.

Sierra Nevada bighorn sheep inhabit open areas where the land is rocky, sparsely vegetated, and characterized by steep slopes and canyons. They prefer open ground to

better detect predators and allow enough time to reach steep, rocky terrain (escape habitat). Forests and thick brush are usually avoided if possible. Most of the bighorn sheep live at higher elevations (10,000–14,000 feet [3,050–4,270 meters]) in subalpine and alpine areas during the summer. During winter, these bighorn sheep occupy high-elevation, windswept ridges and tend to prefer south-facing slopes where snow melts more readily, or they migrate to lower elevations (4,800 feet [1,460 meters]) in sagebrush-steppe areas to avoid deep snow and to find forage.

While distribution of bighorn sheep is naturally fragmented on the landscape, the maintenance of migration corridors (space) is important to allow genetic exchange among Sierra Nevada bighorn sheep herds. The population ecology of bighorn sheep has been described as a metapopulation with geographically distinct herds interacting in a network. The Action Area generally occurs between two herds (the Mt. Gibbs and Mt. Warren herds). Limited potential barriers to movement occur between the two herds other than State Route 120.

4.7.1.9. Habitat and Life History

The distribution of bighorn sheep is determined by topography, visibility, water availability, and forage quality and quantity. Typical Sierra Nevada bighorn terrain is rough, rocky, and steep. It also encompasses alpine meadows, summit plateaus, and meadows fed by springs within escape terrain. In its range, Sierra Nevada bighorn sheep 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 Sierra Nevada bighorn sheep is found in mesic to xeric grasslands of mountains, foothills, or major river canyons and from high alpine habitats to lower elevation foothills. It prefers open areas of low-growing vegetation but stays close to steep, rocky, rugged terrain to escape predators, for lambing, and to bed down for the night. It uses a variety of habitats that can include alpine dwarf-shrub, low sage, sagebrush, subalpine conifer, and montane riparian. It favors open habitats that provide clear views of the surrounding area and avoids areas with dense vegetation.

Browsing is important all year, especially for populations in arid habitats. Mineral licks are also important. The Sierra Nevada bighorn sheep is an herbivore, grazing and eating green succulent grasses, sedges, and forbs but taking some browse when grasses, sedges, and forbs are scarce, such as in the winter. The Sierra Nevada bighorn sheep is usually found in proximity to water, and it uses travel routes between feeding and watering sites.

Sierra Nevada bighorn sheep spend the summer in high-elevation alpine habitats and move down to the lower elevation canyon habitats in the winter where the snow is shallow, and grazing is possible.

The home range of the Sierra Nevada bighorn sheep includes both a summer and winter range. It uses historic travel routes between its ranges. The winter range is generally smaller than the summer range. Groups of ewes stay in distinct ranges, with little

interchange between groups. Rams may travel between groups, particularly during the rut.

The bighorn sheep is diurnal and active year-round. At night, it moves to a bedding location. Its daily activity pattern consists of feeding and then resting and ruminating.

Bighorn sheep have a wide range of social behaviors and are one of the most socially active North American ungulates. They are gregarious and sometimes gather in herds of over 100 individuals, but smaller groups of 8 to 10 are more common. Mature males usually stay in separate bachelor herds for most of the year. The younger females generally stay in their mother's herd. The younger males (2 to 4 years old) eventually leave and join a group of rams. Young sheep of both sexes learn migratory paths and suitable habitats from adults in the group.

Males establish dominance before the rutting season through a series of clashes. The clash is preceded by one or both males turning and walking away from each other a few steps, turning to face each other, and then advancing in a threat jump before lunging into the clash. Immediately following the clash, the males may freeze with heads raised in a "present" posture, thought to be a horn display. The male giving dominance may either rub his horns over the face and chest of the now dominant male or turn and begin to feed. Many rams break off the ends of their horns (called "brooming") during horn clashes for dominance.

Breeding occurs in the winter. The rut generally occurs in November and December. Lambing occurs from mid-April to early June, depending on conditions. Twins are rare. The lifespan of the bighorn ram varies from 10 to 13 years, and the lifespan of the ewe varies from 12 to 20 years.

4.7.2. YOSEMITE TOAD

In the Yosemite toad study area, there are five extant populations of Yosemite toad. The one population at the south end of Saddlebag Lake has been known and well documented by CDFW's California Natural Diversity Database (CNDDB). The remaining locations were previously recorded but have not been consistently documented. As a result of the field surveys from 2022 through 2024 in support of the Project relicensing, five populations were documented.

These five populations include the South Saddlebag pool population, the Eastern Slate Creek Meadow population, the western Tioga Lake Meadow population, the southern margin Tioga population, and the southeastern margin Tioga Lake Meadow population.

Overall, the status of the Yosemite toad in the Action Area could be assessed as healthy and stable.

4.7.2.1. Survey Methods and Study Area Determination

The Yosemite toad study area determination was approached in a stepwise process from literature review to agency consultation, initial field survey, and final area determination.

4.7.2.2. Literature Review

Prior to conducting field surveys, Psomas reviewed the available literature for information on Yosemite toad preferred habitat, life history, and known populations in the Yosemite toad study area and for information on known populations in the Tioga Pass area, as well as other populations in the Sierra Nevada. The literature review identified other potential areas to survey for Yosemite toad and potentially suitable breeding habitat. The primary sources are listed below; however, the References section of this BA includes the additional literature and databases reviewed.

- Aerial and infrared imagery collected in 2021 for vegetation surveys conducted for existing license requirements (Attachment 2);
- Movements and Habitat Use of Yosemite Toads (*Anaxyrus* [formerly *Bufo*] *canorus*) in the Sierra National Forest, California (Liang, 2013);
- Fine-Scale Habitat Characteristics Related to Occupancy of the Yosemite Toad, *Anaxyrus canorus* (Liang et al., 2017);
- Habitat suitability of patch types: A case study of the Yosemite toad (Liang and Stohlgren, 2011);
- Habitat use by Yosemite toads: Life history traits and implications for conservation (Morton and Pereyra, 2010);
- Occurrence data provided by CDFW and USFS biologists;
- CNDDDB (CDFW, 2022b);
- iNaturalist;
- Designation of Critical Habitat for the Sierra Nevada Yellow-Legged Frog, the Northern DPS [distinct population segment] of the Mountain Yellow-Legged Frog, and the Yosemite Toad (USFWS, 2016);
- Decline, Movement, and Habitat Utilization of the Yosemite Toad (*Bufo canorus*): An Endangered Anuran Endemic to the Sierra Nevada of California (Martin, 2008); and
- Yosemite Toad Conservation Assessment (Brown et al., 2015).

4.7.2.3. Agency Consultation

Prior to both the 2022 and 2023 field seasons, the Project team coordinated with the USFWS and CDFW to prioritize the survey locations. Based on coordination with the agencies, the Yosemite toad survey focused on five regions:

- Northern Saddlebag Lake;

- South of Saddlebag Lake;
- Upper Lee Vining Creek;
- Lower Lee Vining Creek; and
- Tioga Lake.

4.7.2.4. 2022 Initial Field Survey

The study area initially consisted of the known Yosemite toad occupied locations adjacent to the Action Area as identified in the CNDDDB (CDFW, 2022b) and other potentially suitable breeding habitat areas, based on a review of aerial imagery. These areas include the following (Exhibit 3, Yosemite Toad Study Area):

- Northern Saddlebag Lake:
 - Northwest end of lake (CNDDDB)
- South of Saddlebag Lake:
 - Wet meadow southeast (CNDDDB)
- Upper Lee Vining Creek
 - No CNDDDB records
- Lower Lee Vining Creek
 - No CNDDDB records
- Tioga Lake:
 - Inlets (CNDDDB)
 - Access roads downstream of Tioga Dam (CNDDDB)

Based on the initial field observations in early 2022, additional areas of potentially suitable breeding habitat along Lee Vining Creek were added to the survey area later in 2022. Exhibit 3 shows the finalized study area based on the literature review, agency consultation, and 2022 initial site survey. Exhibit 3 also shows previously documented occurrences of Yosemite toad near the Action Area as listed in the CNDDDB (CDFW, 2022b).

The final study area (Exhibit 3), which was surveyed in 2023 and 2024, recorded potential breeding habitat characteristics derived from the literature (see Table 4.7-1).

Table 4.7-1. Potential Habitat Characteristics Recorded

Habitat Characteristic	Unit of Measurement
Approximate percentage of the pooled area with emergent vegetation growing from within (such as terrestrial grasses submerged within the pooled water)	None, 25%, 50%, 75%, or greater than 95%
Presence or absence of tree canopy cover within 16.4 feet (5 meters) of the pooled area	Presence or absence
Approximate percentage of vegetative cover of adjacent terrestrial areas (up to 6.6 feet [2 meters] from pool edge) by herbaceous plants or woody plants less than 1 meter tall	Less than 5%, 25%, 50%, 75%, or greater than 95%
Approximate percentage of vegetative cover of adjacent terrestrial areas (up to 6.6 feet [2 meters] from pool edge) by woody plants greater than 3.3 feet (1 meter) tall	Less than 5%, 25%, 50%, 75%, or greater than 95%
Dominant plant species within 6.6 feet (2 meters) of pool edge	Grasses (<i>Poaceae</i> family), shrubby willows (<i>Salix</i> species), and/or pines (<i>Pinus</i> species)
Presence or absence of wildlife burrows within 6.6 feet (2 meters) of pool edge	Presence or absence
Presence or absence of accumulated aquatic detritus within the pooled area	Presence or absence
Water flow into the pooled area	Lentic (still), or Lotic (flowing)
Deepest water depth of the pooled area	Centimeters up to 30
Approximate percentage of pooled area less than 12 inches (30 centimeters) deep	None, 25%, 50%, 75%, or 100%
Life stage of any Sierran tree frog (<i>Pseudacris sierra</i>) observed	None, tadpole, or adult
Life stage of any toad (<i>Anaxyrus</i> sp.) observed	None, tadpole, or adult
Species of any other aquatic or semi-aquatic vertebrate observed	Brook trout (<i>Salvelinus fontinalis</i>), and/or mountain garter snake (<i>Thamnophis elegans elegans</i>)
Approximate surface area of the above ground water observed	Square meters
Median distance from the closest three potential habitats	Meters

- The Northern Saddlebag Lake Region includes the margins of the northern half of Saddlebag Lake, the northern inlets to the lake coming from Greenstone Lake, and some pools along the northern portion of Greenstone Lake.
- The South of Saddlebag Lake Region includes the two pools south of Saddlebag Lake (supporting a well-established Yosemite toad population), a large pool within the Sawmill Campground, a small meadow located south of the trail into the Sawmill Campground, and a small pool located along a southwestern-facing slope approximately 1,345 feet (410 meters) south of Saddlebag Lake and approximately 1,345 feet (410 meters) northeast of Sawmill Campground.

- The Upper Lee Vining Creek Region is composed of a large, elevated meadow complex located downstream from the Slate Creek–Lee Vining Creek intersection.
- The Lower Lee Vining Creek Region is composed of the Lee Vining Creek basin extending downstream from the Upper Lee Vining Creek Region to the intersection of Lee Vining Creek with the Junction Campground.
- The Tioga Lake Region consists of all potential breeding habitat along the margins of Tioga Lake up to 200 feet (60 meters) out from the Action Area, including the major inlets from the south and the minor inlets from the east and west.

4.7.2.5. Visual Encounter Surveys

Focused visual encounter surveys for Yosemite toad were performed within potential breeding habitat in the study area for 3 consecutive years. Two survey years were performed to document previously unknown breeding locations. Further, the 2022 field season had lower-than-average snowfall.⁴ This lack of normal snowfall caused potential breeding ponds to dry out early in the season. The 2023 field season was performed to observe breeding in those ponds and other identified potential breeding areas because 2023 was an above-average precipitation year. A third field season was added, 2024, to confirm breeding in all previously identified Yosemite toad breeding locations.

Surveys were performed during the daytime starting at least 2 hours after sunrise to coincide with warmer air temperatures and peak toad activity periods. The first survey visit in 2022 (June 1) was determined in cooperation with CDFW and per observations of the snow conditions made by SCE Operations staff. All parties agreed that enough snow had melted to potentially allow toad breeding. The first survey in 2023 (July 6) was determined using similar observation data on the remnant snowpack made by SCE Operations staff. Table 4.7-2 lists the survey dates, the biologist(s) performing the survey, and any study area accessibility issues.

Table 4.7-2. Visual Encounter Survey Dates and Study Area Accessibility

Survey Year	Survey Date	Surveying Biologists	Accessibility Notes
2022	June 1–2	Steve Norton, Jonathan Aguayo	Tioga Lake completely thawed. Saddlebag Lake mostly frozen. Northern Saddlebag completely covered in snow. Open water in southern Saddlebag pool was amphibian accessible.
	June 15–16	Steve Norton, Jason Berkley	Saddlebag Lake completely thawed. Northern Saddlebag no longer covered in snow.
	July 26–27	Steve Norton, Jonathan Aguayo	All areas were accessible.

⁴ The average snow depth in Tioga Pass during the April measurements (between 1939 and 2023) is 68 inches. The same measurement in April of 2022 was 13.5 inches (50% of average) and in April of 2023 was 64.5 inches (211% of average) (NRCS, 2023).

Survey Year	Survey Date	Surveying Biologists	Accessibility Notes
	August 9–11	Jason Berkley	Upper Lee Vining Creek area added to survey area.
	August 23–24	Steve Norton, Jason Berkley	All areas accessible.
2023	July 6–7	Steve Norton, Sarah Berryman	Ellery Lake thawed. Tioga Lake mostly frozen. Saddlebag Lake Road closed to vehicles; biologists entered on foot. Southern Saddlebag pool covered by snow and not amphibian accessible. West side of Lee Vining Creek inaccessible to biologists due to high creek flows and snowpack.
	July 13–14	Steve Norton, Sarah Berryman	Saddlebag Lake Road partially plowed. Tioga Lake completely thawed. Saddlebag Lake mostly frozen. Open water amphibian-accessible in southern Saddlebag pool. Lee Vining Creek (both upper and lower portions) remained inaccessible to biologists due to high flows.
	July 21–22	Jason Berkley, Sarah Berryman	All of Lower Lee Vining Creek accessible by biologists.
	July 27–28	Jason Berkley	Upper Lee Vining Creek accessible by biologists.
	August 1–2	Jason Berkley, Jonathan Aguayo	All areas accessible.
	August 9–11	Steve Norton, Sarah Berryman	All areas accessible.
	August 23	Steve Norton	All areas accessible.
	September 20–21	Jason Berkley	All areas accessible.
	October 10–11	Steve Norton	Pool south of Saddlebag Lake frozen over.
	October 31–November 1	Jason Berkley	Toga Lake remains thawed, but Ellery Lake now mostly frozen. Recent snow on ground.
2024	June 12-14	Jason Berkley	All areas accessible.
	July 16-19	Jason Berkley	All areas accessible.
	September 16-19	Jason Berkley	All areas accessible.

The visual encounter surveys consisted of pedestrian, diurnal searches to determine the presence of any species in the *Anaxyrus* genus (hereafter referred to as “toad”). Binoculars were used to directly observe wildlife (amphibian or otherwise) from a distance to minimize potential trampling risk to Yosemite toads. Further, care was taken to not trample sensitive habitat, such as wet meadow areas potentially supporting Yosemite toad tadpoles, subadults, and adults. All wildlife species observed directly or indirectly (including observations of species’ evidence such as scat, footprints, burrows, inactive nests, eggs strings, etc.) were recorded in field notes. Any evidence of significant pedestrian or bicycle traffic observed during the surveys in potential toad breeding habitat

was also noted. All life stages of toad were sought during the surveys, including eggs, tadpoles, subadults, and adults. Lake shorelines, stream banks, and relevant habitats were visually and aurally (listening to diagnostic vocalizations) scanned for signs of breeding activities (including egg masses, larval toads, adults, and adult advertisement calls) and for potentially suitable breeding habitat.

Potentially suitable habitat was assessed using the PCEs for habitat as defined by the USFWS and presented in Section 4.8.2, Yosemite Toad Critical Habitat. Areas matching these criteria were mapped as potentially suitable habitat using GPS-enabled tablets with high resolution aerial photographs. All toad breeding locations observed were documented using the same tablets. Photographs were taken of each site and associated habitat and, where possible, of Yosemite toads at all life stages. For parity with relevant data in the CDFW High Mountain Lakes—Amphibian and Reptile Visual Encounter Sheet (CDFW, 2024) and per the potentially relevant habitat elements identified during our literature review, a data dictionary loaded onto a tablet device was utilized to collect observed habitat parameters on each of the potential toad breeding locations during the surveys. A list of the habitat parameters identified was submitted to both CDFW and USFWS for review prior to 2023 (the second survey year). The subsequent potential habitat characteristics recorded during the surveys are shown in Table 4.7-2. Note that two characteristics (approximate surface area of above ground water observed and median distance from the closest three potential habitats) were calculated after the field season using Geographic Information System (GIS) software.

For consistency in data collection, surveys were conducted by the same four qualified biologists: Steve Norton, Jason Berkley, Jonathan Aguayo, and Sarah Berryman. To further standardize data collection, field surveys were scheduled so that the biologists would rotate and pair with the previous week's surveyor.

Upland habitat was assessed during the 2024 survey season by walking an additional buffer of 500 feet out from the established study area. The upland areas surrounding were assessed for those PCEs required to sustain Yosemite toad over the remainder of the year when not breeding, specifically:

- Sufficient cover (including rodent burrows, logs, rocks, and other surface objects) to provide summer refugia;
- Foraging habitat;
- Adequate prey resources;
- Physical structure for predator avoidance;
- Overwintering refugia for juvenile and adult Yosemite toads;
- Dispersal corridors between aquatic breeding habitats;

- Dispersal corridors between breeding habitats and areas of suitable summer and winter refugia and foraging habitat; and/or
- The natural hydrologic regime of aquatic habitats.

4.7.2.6. Acoustic Recording Surveys

Six acoustic recording devices were deployed in potential toad breeding habitat across the study area during the 2023 survey season (July through October). The devices were Song Meter Micro units manufactured by Wildlife Acoustics and were programed to record 5 consecutive minutes every hour. The devices were deployed as access became available (snow melted and water began pooling) and, where possible, deployment at each location was staggered to record during the peak breeding period anticipated at that location. Ten locations were ultimately sampled. The devices were affixed to vegetation adjacent to either known or high-potential toad breeding locations: four of the locations were along Lee Vining Creek, three of the locations were around Tioga Lake, two of the locations were around Saddlebag Lake, and one of the locations was in a meadow south of Saddlebag Lake between approximately 1,410 to 1,475 feet amsl (430 to 450 meters). Memory card status and battery life were checked and maintained throughout the 2023 field season. The deployment and collection dates are shown in Table 4.7-3, and the number of hours recorded at each location appears in the Yosemite Toad Final Technical Report (Attachment 1, TERR-2 General Wildlife Technical Report). Locations of the acoustic detectors are shown in Exhibits 9a to 9d, Survey Results.

Table 4.7-3. 2023 Acoustic Detector Deployment Dates

2023 Survey Dates	Deployment/ Collection Location	Accessibility Notes
July 6–7	Deployed acoustic detectors at Tioga Lake 3, Tioga Lake 2, Tioga Lake 1, and Lower Lee Vining Creek 2.	Ellery Lake thawed. Tioga Lake mostly frozen. Saddlebag Lake Road closed to vehicles; biologists entered on foot. Southern Saddlebag pool covered by snow and not amphibian accessible. West side of Lee Vining Creek inaccessible to biologists due to high creek flows and snowpack.
July 13–14	Relocated acoustic detectors from Tioga Lake 1 and Lower Lee Vining Creek 2 to South of Saddlebag 1 and 2. Deployed additional detector to Lower Lee Vining Creek 1.	Saddlebag Lake Road partially plowed. Tioga Lake completely thawed. Saddlebag Lake mostly frozen. Open water amphibian-accessible in southern Saddlebag pool. Western Lee Vining Creek (both upper and lower portions) remained inaccessible to biologists due to high flows.
July 27–28	Relocated acoustic detectors from Tioga Lake 3 and Tioga Lake 2 to Upper Lee	Upper Lee Vining Creek now accessible by biologists.

2023 Survey Dates	Deployment/ Collection Location	Accessibility Notes
	Vining Creek 1 and Upper Lee Vining Creek 2.	
August 9–11	Collected acoustic detector from Upper Lee Vining Creek 1 and deployed at Northern Saddlebag Lake.	All areas accessible.
September 20–21	Collected acoustic detectors from Lower Lee Vining Creek 1, South of Saddlebag 1 and 2, and Northern Saddlebag Lake.	All areas accessible.
October 10–11	Collected acoustic detector from Upper Lee Vining Creek 2.	Pool south of Saddlebag Lake frozen over.

The recordings collected were downloaded at the end of the season and processed to isolate and identify any Yosemite toad breeding calls recorded. A sample of 270 recordings known to have contain multiple Yosemite toad breeding calls were manually vetted by Biologist Steve Norton, which included visually inspecting sonograms of the recordings and listening to relevant portions of the recordings. Mr. Norton then adjusted the settings in the cluster analysis tool part of Wildlife Acoustic's Kaleidoscope software to isolate potential Yosemite toad breeding calls. After a detailed refinement of the settings to sufficiently isolate calls within the vetted 270 recordings, the remaining 8,800 recordings were run through the cluster analysis tool. The isolated files were then manually vetted, and the number of verified Yosemite toad calls were tabulated. A total of 399 recordings were identified as containing Yosemite toad breeding calls.

4.7.2.7. DNA Sampling

In collaboration with the National Park Service, samples suitable for DNA analysis were obtained from two populations of toad within the study area. These samples were collected on August 8, 2023. The two populations sampled were located at the pool south of Saddlebag Lake (approximately 295.3 feet [90 meters] east of Saddlebag Campground) and at the meadow complex immediately below the intersection of Slate Creek and Lee Vining Creek in the Upper Lee Vining Creek Region. Table 4.7-4 shows the location and type of sample collected by Yosemite National Park.

Table 4.7-4. Genetic Sampling of Toad Within Study Area

General Sampling Region	Latitude	Longitude	Elevation	No. of Individuals Observed During Sampling	No. of Samples Collected
South of Saddlebag Lake	37.96511	-119.26891	10,079 feet amsl	200–300 tadpoles	10 tadpoles
Upper Lee Vining Creek	37.95694	-119.27389	9,850 feet amsl	200–250 tadpoles	10 tadpoles

amsl = above mean sea level

The samples collected will ultimately be compared against a hybrid genetic panel of Yosemite toad and western toad (*Anaxyrus boreas*) currently being developed by the Eldorado National Forest.

4.7.2.8. Results

Table 4.7-5 lists the collective survey results for Yosemite toad for each survey year (2022-2024) for each survey region. The survey region and location number reference the respective potential breeding habitat surveyed as shown in Exhibit 9. The results include the results of the visual encounter surveys and the acoustic surveys.

Table 4.7-5. Yosemite Toad Survey Results

Survey Region	Location No. ¹	Evidence of Breeding Yosemite Toad Observed			Notes
		2022	2023	2024	
Northern Saddlebag Lake	1-9	a	a	a	Near Greenstone Lake inlet to Saddlebag Lake.
South of Saddlebag Lake	11	P	P	P	Known breeding pool; all life stages observed every year.
	12	a	a	a	Approximately 50 feet east of known breeding pool (Location 11).
	13	n/c	a	a	Remote pool approximately 1,000 feet south of Saddlebag Lake. Not surveyed in 2022.
Upper Lee Vining Creek	14, 21	a	a	a	Sawmill Campground
	15, 20, 22	a	a	a	Meadow along Slate Creek. Not surveyed until August 9, 2022.
	16, 18, 19	a	P	P	Meadow along Slate Creek. Not surveyed until August 9, 2022. Tadpoles observed.
Lower Lee Vining Creek	23-30, 32-43, 60-62	a	a	a	Potential habitat within the lower Lee Vining Creek floodplain.
	31, 63	n/c	a	a	Two adjacent pools within the lower Lee Vining Creek floodplain. Recently hatched, unidentified tadpoles (possibly toad) were observed during one visit of 2022. Tadpoles were potentially toad tadpoles; however, they were too small to identify without capture. The pools had dried completely during subsequent visits and no confirmation could be made. No other evidence of toad breeding was observed throughout the lower Lee Vining Creek floodplain was observed at any other time.

Survey Region	Location No. ¹	Evidence of Breeding Yosemite Toad Observed			Notes
		2022	2023	2024	
Tioga Lake	44, 45, 47, 49	a	a	a	Potential habitat along the north and south-eastern margins of Tioga Lake.
	48	P	P	a	Small portion of the meadow along the southeastern margin of Tioga Lake at Dana Lake inlet. Calling adults, eggs, and tadpoles observed.
	46	a	a	P	Meadow located along the western margin of Tioga Lake. Breeding adult heard calling in 2024.
	50	a	P	n/c	Meadow located south of Tioga Lake. Breeding calls recorded acoustically 2023; not surveyed in 2024.

Legend

¹ – Location numbers are not sequential nor continuous.

“P” = present: evidence of Yosemite toad breeding observed;

“a” = absent: no evidence of Yosemite toad breeding observed;

“n/c” = not conclusive: survey results not conclusive for that year.

2022 SURVEY RESULTS

In 2022, all life forms of Yosemite toad (eggs, tadpoles, subadults, and adults) were observed in the pool south of Saddlebag Lake (Exhibit 9b, Location 11), which is a well-established breeding area for the species. There was no evidence of Yosemite toad breeding observed in the large meadow complex associated with Slate Creek (Exhibit 9b, Upper Lee Vining Creek region); however, this area was not surveyed until August 9 after toad breeding activity had likely dispersed. In the Lower Lee Vining Creek region (Exhibit 9c), multiple potential breeding pools were inspected. Recently hatched, unidentified tadpoles (possibly toad) were observed in two adjacent pools within the lower Lee Vining Creek floodplain (Exhibit 9c, Locations 31 and 63). Tadpoles were potentially toad (*Anaxyrus* sp.); however, they were too small to identify without capture. The pools had dried completely during subsequent visits, and no genus confirmation could be made. No other evidence of toad breeding was observed throughout the lower Lee Vining Creek floodplain. In the Tioga Lake region, a portion of the overflow meadow associated with the larger inflow from the Dana Lake area was observed by CDFW to contain Yosemite toad tadpoles (Exhibit 9d, Location 48).

2023 SURVEY RESULTS

In 2023, all life forms of Yosemite toad (eggs, tadpoles, subadults, and adults) were again observed in the pool south of Saddlebag Lake (Exhibit 9b, Location 11). Toad tadpoles were observed in the Upper Lee Vining Creek region (Exhibit 9b, Locations 16, 18, 19). In the Lower Lee Vining Creek region (Exhibit 9c), no evidence of Yosemite toad or toad breeding was observed. In the Tioga Lake region, calling adults and tadpoles were observed at the Dana Lake inflow area along Tioga Lake (Exhibit 9d, Location 48). Additionally, calling adults were recorded on the audio recorders in a pool above Tioga Lake to the south (Exhibit 9d, Location 50).

2024 SURVEY RESULTS

In 2024, all life forms of Yosemite toad (eggs, tadpoles, subadults, and adults) were again observed in the pool south of Saddlebag Lake (Exhibit 9b, Location 11). Toad tadpoles were observed in the Upper Lee Vining Creek region (Exhibit 9b, Locations 16, 18, 19). In the Lower Lee Vining Creek region (Exhibit 9c), no evidence of Yosemite toad or toad breeding was observed. In the Tioga Lake region, no evidence of breeding at the Dana Lake inflow area was observed (Exhibit 9d, Location 48); however, a breeding adult was heard calling in the meadow near the western side of Tioga Lake (Exhibit 9d, Location 46). The pool south of Tioga Lake was not surveyed (Exhibit 9d, Location 50).

ACOUSTIC SURVEYS

Acoustic recording devices were deployed in potential toad breeding habitat in the 2023 survey season (July through October). Of the 10 locations deployed, only 2 audio recorder locations detected Yosemite toad breeding calls. Exhibit 10 below shows the number of separate call events recorded throughout the period sampled daily at the two separate locations. Note, the number of separate call events shown on Exhibit 10 includes instances of overlapping calls by different males simultaneously listed as one separate call.

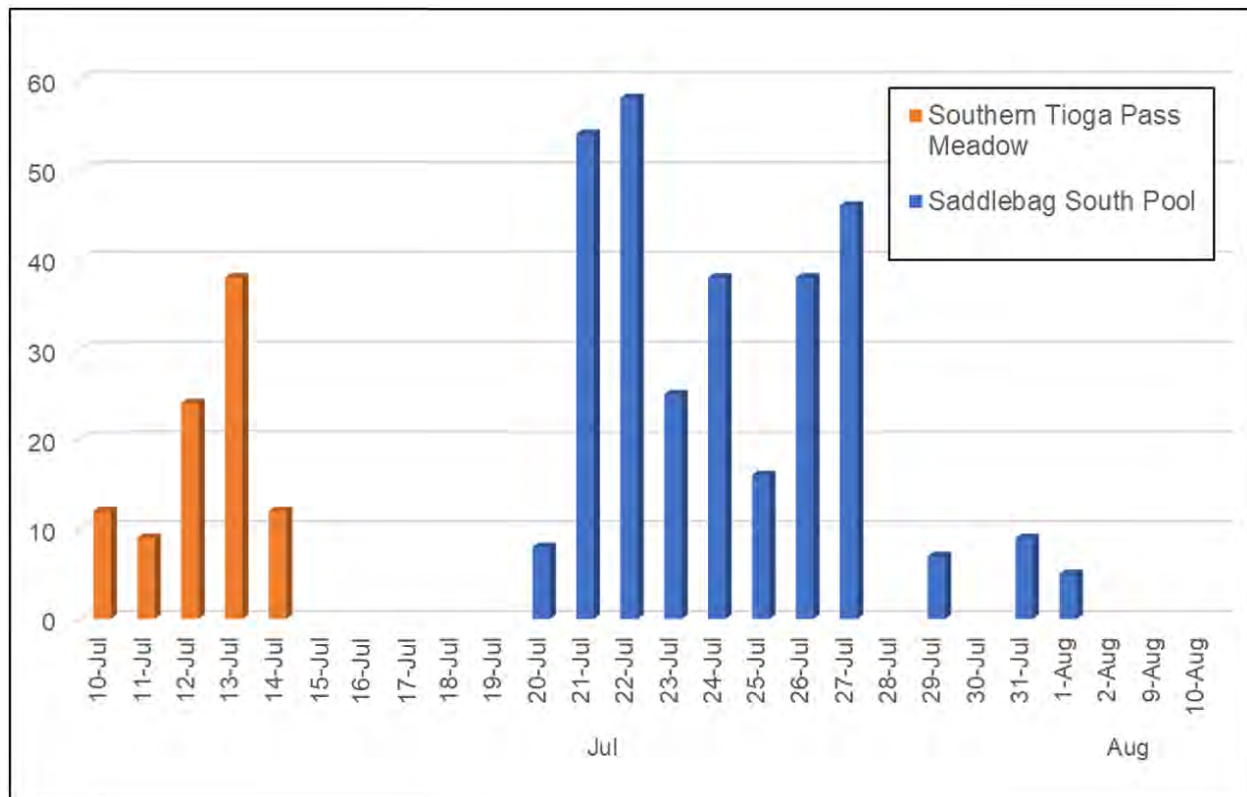


Exhibit 10. Yosemite Toad Breeding Calls Recorded Daily

The audio recorders were determined to have a recordable range between approximately 50 to 100 feet (15 to 30 meters). This range was not systematically tested, but all calls at

or greater than 100 feet (30 meters) away were subsequently determined to be out of range of the recorders. Exhibits 9a to 9d show the location of the audio recorders in relation to the potential breeding habitat observed.

AVAILABLE OTHER BREEDING HABITATS

Based on observations made during the three field seasons, 49 other potential breeding locations within the study area were identified. The field parameters assessed are described in detail in Section 4.7.2, Yosemite Toad. No consistent patterns between occupied and unoccupied habitat were observed or recorded.

UPLAND HABITAT

The vast majority of the study area contains upland habitat elements known to support Yosemite toads, as identified in the PCEs for the species by the USFWS (2016). Specifically, suitable upland habitat is considered areas up to 0.78 miles (1.26 kilometers) away from breeding habitat (not separated by dispersal barriers, such as heavily used roadways).

Exhibit 11, Yosemite Toad Upland Dispersal Potential, demonstrates that all the Yosemite toad populations have access to upland habitats without significant barriers. The upland habitats available evince the necessary characteristics to support Yosemite toads throughout the nonbreeding season, including complex undergrowth such as dense scrubby willow tangles, meadow habitats with ground squirrel burrows, and gopher burrows for refugia. These areas also support small streams with aquatic habitat and prey beside the terrestrial insect prey base available.

Exhibit 11 also demonstrates that Hwy 120 presents a dispersal barrier to Yosemite toad movement between the Tioga Lake populations and the populations at Saddlebag Lake and Lee Vining Creek. However, the Tioga Lake populations have no barrier to disperse between themselves and, based on the literature, should be able to have interaction with populations in the Tioga Meadows area closer to the entrance to Yosemite National Park.

The Saddlebag Lake and Lee Vining populations have the developed campground and Saddlebag Road between them. However, both populations have free access to excellent upland habitat without barriers.

STATUS AND THREATS OVERALL

The species historically inhabited elevations ranging from 4,790 to 11,910 feet (1,460 to 3,630 meters) (Stebbins, 2003) and was most abundant above 8,000 feet (2,438 meters) below permanent snow and ice. Occupancy studies indicate a decline of greater than 50 percent of former sites range-wide (Stebbins and Cohen, 1995; Drost and Fellers, 1996). Current populations are thought to be very small (fewer than 20 adult males). The only long-term, site-specific population study of the Yosemite toad at Tioga Pass Meadow from 1971 to 1991 found a dramatic decline from 258 males entering breeding pools, down to 28 in the early 1980s, with only one found in 1991 (Kagarise Sherman and Morton, 1993). Within its current range on National Forest lands, breeding is currently found in only 22

percent of watersheds (Brown et al., 2012). The Yosemite toad is imperiled by a variety of factors, especially damage and loss of habitat, livestock grazing, chytrid fungus, and global climate change (Lannoo, 2005; Davidson and Fellers, 2005; Martin, 2008; Green et al., 2014). High meadow habitat quality in the western United States, and specifically the Sierra Nevada, has been degraded by a variety of stressors over the last century (Ratliff, 1985; Vale, 1987).

Because Yosemite toads rely on shallow, ephemeral water, they may be particularly sensitive to even minor impacts on their habitat. Drying of meadow systems is one of the more significant changes, primarily because of widespread historic livestock overgrazing (Ratliff, 1985; Menke et al., 1996; Lind et al., 2011; Weixelman et al., 2011; McIlroy et al., 2013). Timber harvest, road construction, and an altered fire regime has introduced additional disturbance pressures to meadows, including tree encroachment. Approximately 33 percent of the toad's current range is within active USFS grazing allotments. Besides degradation of meadow habitat, livestock and recreation (including hikers, pack animals, and vehicles) can directly impact individual toads through trampling, collapse of rodent burrows, and harassment. Breeding toads and metamorphs are particularly vulnerable to such trampling (Martin, 2008).

Although effects of road and trail fragmentation on Yosemite toad populations is unknown, there is evidence that roads and trails reduce Yosemite toad connectivity (Maier, 2018). Diseases, especially chytrid fungus, also play an important role in Yosemite toad population dynamics. Although Yosemite toad individuals appear less prone to epidemic outbreaks than mountain yellow-legged frogs (*Rana sierra/mucosa*) (Green and Kagarise Sherman, 2001; Brown et al., 2015), pathogen prevalence appeared to coincide with recent declines (Fellers et al., 2007; USFWS, 2013). From 2006 to 2011, Dodge and Vredenburg (2012, as cited in USFWS, 2013) found infection intensities between 17 and 26 percent, and that juvenile toads were more likely to be infected.

In an experimental study, 100 percent of juvenile toads exposed to chytrid fungus became infected and died within 25 days (Lindauer, 2018). Yosemite toads are expected to be vulnerable to a warming climate, but recent genetic research illustrated that the genetic diversity of Yosemite toads in Yosemite National Park may allow for local adaptation to climate change. Maier (2018) identified four main lineages of Yosemite toad in Yosemite National Park and patterns of tadpole development differed between lineages. For example, tadpoles developed faster in one lineage, which may prove advantageous if meadows dry at a faster rate in a warming climate. As the majority of remaining populations are likely small and isolated, they are vulnerable to stochastic environmental events and loss of genetic diversity (USFWS, 2014). Additionally, the Yosemite toad's high fidelity to breeding and non-breeding sites can increase the vulnerability of small populations when individuals return to habitats that are no longer suitable.

4.7.2.9. Listing Status

The Yosemite toad was listed as a threatened species on April 29, 2014, under the ESA of 1973 (USFWS, 2014). A total of 16 critical habitat units encompassing 50,926 acres was designated for this species on August 26, 2016. These units are located in Alpine,

Fresno, Inyo, Madera, Mariposa, Mono, and Tuolumne counties (USFWS, 2016). The entire extent of the FERC Project Boundary, including and upstream from Rhinedollar Dam, is located within Critical Habitat Unit 5, which is the second largest unit of designated critical habitat.

4.7.2.10. Description of the Species

Most of the species description below was taken from the March 3, 2020 Biological Opinion issued by the USFWS to Yosemite National Park for Wilderness Pack Stock Use (USFWS, 2020). Portions of this description have been updated with more recent findings on the species.

The Yosemite toad was originally described as *Bufo canorus* by Camp (1916). Frost et al. (2006) divided the paraphyletic⁵ genus *Bufo* into three genera, assigning the North American toads, including the Yosemite toad, to the genus *Anaxyrus*.

The Yosemite toad is a moderately sized amphibian ranging in size from 1.2 to 2.8 inches (30.5 to 71.1 mm) (Lannoo, 2005; Dodd, 2013). Juveniles have a thin mid-dorsal stripe that disappears or is reduced with age, a process that occurs more quickly in males (Lannoo, 2005; Dodd, 2013). The toad's iris is dark brown with gold iridophores⁶ (Dodd, 2013), and it has large parotid glands that are rounded to slightly oval in shape, situated at a distance less than one gland-width apart. Male Yosemite toads are smaller than females, with less conspicuous warts (Stebbins, 1951; Stebbins, 2003; Lannoo, 2005; Stebbins and McGinnis, 2012; Dodd, 2013; Green et al., 2014). Males have a nearly uniform dorsal coloration of yellow green, olive drab, or darker greenish brown, whereas females have black spots or blotches edged with white or cream set against a gray, tan, or brown background color (Jennings and Hayes, 1994; Lannoo, 2005; Dodd, 2013; Green et al., 2014).

Yosemite toad tadpoles exhibit a uniform black coloration, concealing their coiled intestines from view. The snout, when viewed in profile, appears blunt and rounded from above (Karlstrom and Livezey, 1955; Stebbins, 1951, 2003). The dorsal fin of Yosemite toad tadpoles is transparent and marked with a few relatively large branched melanophores, with the tail reaching its greatest depth about midway along its length (Karlstrom and Livezey, 1955). Tadpoles measure between 0.39 to 1.46 inches (10 to 37 millimeters) in length and develop two upper and three lower rows of labial teeth (or denticles), with a gap in the first upper row (Stebbins, 1951; 2003; Karlstrom and Livezey, 1955).

Yosemite toad eggs are laid in two strings (one from each ovary), appearing as individual strands, a double strand, or variously folded to form a radiating network or a cluster of four to five eggs deep (Karlstrom and Livezey, 1955; Kagarise Sherman, 1980). Each strand is enveloped by two jelly layers, with an outer thinner envelope creating a scalloped

⁵ A group of animals including a common ancestor and some, but not all, of the descendants.

⁶ Iridophores are the cells that are made up of stacks of thin protein plates that function as multilayer reflectors.

casing due to the way the jelly constricts around each egg, and a thicker inner envelope individually surrounding each egg (Karlstrom and Livezey, 1955).

4.7.2.11. Current Range and Distribution

The Yosemite toad is endemic to the high-elevation Sierra Nevada in California, ranging from the Blue Lakes Region north of Ebbetts Pass in Alpine County to just south of Kaiser Pass in the Evolution Lake / Darwin Canyon area in Fresno County (Jennings and Hayes, 1994; Lannoo, 2005; Liang, 2010; Liang and Stohlgren, 2011; Stebbins and McGinnis, 2012; Dodd, 2013; Green et al., 2014). Most of the Yosemite toad's range occurs on lands managed by the USFS (72 percent; USFS, 2014) or National Park Service.

4.7.2.12. Habitat and Life History

Yosemite toads typically inhabit high-elevation wet meadows and lakeshores surrounded by forests or shrublands (Camp, 1916; Lannoo, 2005; Stebbins and McGinnis, 2012; Wang, 2012; Dodd, 2013). The toad is capable of successfully utilizing both large and small patches of potential habitat but prefers sites with less variation in mean annual temperature (Liang, 2010). Breeding and rearing take place at the time of snowmelt (Psomas field observation) and after snowmelt (generally May to June) in shallow warm waters of primarily wet meadows, but also small permanent and ephemeral ponds, lake edges, and slow-moving streams (Karlstrom and Livezey, 1955; Kagarise Sherman and Morton, 1993; Martin, 2008). Liang's (2010) study in the Sierra National Forest highlighted that breeding sites were likely to be in seasonal waters with warmer water temperatures, facing a southwesterly direction. Knapp (2005) in Yosemite National Park associated breeding occurrence with high elevations and meadow shorelines, while Roche et al. (2012) found positive correlations between annual occupancy and annual precipitation. In a comprehensive 8-year study across 14 watersheds (2002 to 2009), Brown et al. (2012) discovered that only 30 percent of 61 breeding sites were consistently occupied, and most watersheds had 1 to 2 consistently occupied sites, with others occupied intermittently. These unoccupied sites remain important because they are often reoccupied in later years. The reasons for these patterns, whether due to small population sizes or variations in habitat and environmental conditions, remain unclear (Brown et al., 2012).

Males emerge first from overwintering sites and form breeding choruses (Kagarise Sherman, 1980; Kagarise Sherman and Morton, 1984). Breeding occurs over a few days to a few weeks between May and July, with females leaving breeding sites before males (Kagarise Sherman, 1980; Brown et al., 2012). Females lay a large clutch, sometimes 1,000 to 2,000 eggs in a single season, and may either split their clutches or lay them communally with other toads (Kagarise Sherman, 1980; Brown et al., 2015). Clutches are laid in shallow water (1.5 to 3 inches), along the edges of small pools or flooded meadows (Kagarise Sherman, 1980; Roche et al., 2012). Eggs hatch in 4 to 15 days; tadpoles metamorphose in 40 to 50 days and do not overwinter (Jennings and Hayes, 1994; Brown et al., 2014). The Yosemite toad is a late-maturing and long-lived species, known to live up to 18 years (Kagarise Sherman and Morton, 1984). Females first breed when they are 4 to 6 years of age (Kagarise Sherman, 1980). Most adult males appear to breed annually,

whereas females may skip years between breeding (Kagarise Sherman, 1980; Brown et al., 2012).

Adults are difficult to find outside of the breeding season, so less is known about non-breeding habitat, where they spend the majority of their lives. One study conducted in subalpine forest in the Stanislaus National Forest found that toads dispersed upslope, generally along ephemeral streams, seeps, or springs with lush vegetation (Martin, 2008). Another study conducted in a drier habitat in the Sierra National Forest demonstrated that toads extensively used upland habitats and were found most often in burrows, both shallow and underground, but also under logs, rocks, and tree stumps (Liang, 2010). Martin (2008) reported the mean total home range for the Yosemite toad in the Stanislaus National Forest study area was 2.09 acres (8,457.93 square meters). In the Sierra National Forest, Yosemite toads moved up to 3,780 feet (1,260 meters) from their breeding pools, with a mean distance of 810 feet (270 meters) (Liang, 2013). Morton (1981) reported several female Yosemite toads 2,250 feet (750 meters) from the nearest breeding pools. On the Stanislaus National Forest, Martin (2008) reported maximum dispersal distances for Yosemite toads at 1,973 feet (657.44 meters) from breeding pools to upland foraging habitat; however, most Yosemite toads observed traveled less than 750 feet (250 meters).

Martin (2008) found that this species conducts much of its post reproductive activity at night and that many of the long-range migrations took place nocturnally. Most of the longer-distance movements occur in the 2 months after the breeding season. Additionally, there appear to be some sex-specific differences in nonbreeding habitat use and movement: females tend to range further than males (Martin, 2008; Liang, 2010; Morton and Pereyra, 2010). Morton and Pereyra (2010) found that during late July and August at Tioga Pass, females were more likely to move farther upland to rocky hillside habitats and males stayed in lowland meadow habitats near breeding ponds. Adult females appear to spend much of the active season in upland habitats except for the few days spent breeding every 2 to 3 years (Kagarise Sherman, 1980).

To overwinter, toads may use rodent burrows, crevices under rocks and stumps, and root tangles at the base of willows (Davidson and Fellers, 2005; Kagarise Sherman, 1980; Martin, 2008). Some metamorphs appear to overwinter their first year in the terrestrial meadow habitat adjacent to their rearing site but move to more distant terrestrial habitat during mid-summer of their second year (Kagarise Sherman and Morton, 1993; Morton and Pereyra, 2010). Individual Yosemite toads show high fidelity to both breeding meadows and terrestrial habitats (Brown et al., 2012; Kagarise Sherman and Morton, 1984; Liang, 2010).

Detecting Yosemite toads is difficult because of short suitable survey periods for each life stage. Adult males are most easily detected during the short breeding window at snowmelt (1 to 2 weeks). As tadpoles are present for a longer period of time (6 to 8 weeks), they could be easier to find, but again, surveys must be carefully timed. Furthermore, even the breeding meadows and breeding areas within the meadows can be highly variable according to snowpack and management activities. Toads are rarely

seen once they disperse into their upland habitats, and thus determining presence or absence is challenging (Brown et al., 2012).

Diet has not been well-characterized, but the toads are thought to be largely ambush predators and consume primarily terrestrial invertebrates during the non-breeding active season (Mullally, 1953). Martin (2008) observed that much of the foraging activity in terrestrial habitats for this species appears to occur at night. Grinnell and Storer (1924) reported stomach contents, including tenebrionid beetles, weevils, large ants, a centipede, and fir needles.

In 1991, Martin analyzed stomach contents of Yosemite toads at various life stages, revealing a diverse range of prey items from six insect orders and two arachnid groups. The data suggested a shift in prey size with body size. Newly metamorphosed toads primarily consumed spider mites and owl flies, while 2-month-old metamorphs shifted to small spiders and chalcid wasps. One-year-olds predominantly consumed ants, and adult toads exhibited varied diets. Tadpoles are grazers and highly opportunistic (Grinnell and Storer, 1924). Opportunistic feeding behavior, such as swarming on a dead ground squirrel, has been documented in tadpoles (Martin, 1991). Instances of Yosemite toads feeding on the tadpoles of chorus frogs (*Pseudacris regilla/sierrae*) and predaceous diving beetle (family *Dytiscidae*) larvae have been observed, though the opportunistic nature of these interactions remains unclear (Brown et al., 2015).

It has been noted for some years that Yosemite toad and western toad (*Anaxyrus boreas*) hybridize (Maier and Mabe, 2024). Maier and Mabe (2024) have confirmed the presence of Yosemite toad-western toad hybrid individuals in the Blue Lakes region of the El Dorado National Forest, which is approximately 50 miles north of the Action Area. A review of museum records available from VertNet, IDigBio, and other databases for Mono County and the surrounding area shows that both western toad and Yosemite toad were collected by Robert Stebbins near the entrance to Yosemite National Park in the mid-1950s. There are also occurrences of Yosemite toad and western toad at Frog Lake just north of the Action Area, with one anecdotal putative hybrid (Exhibit 12, Historic Regional Yosemite Toad and Western Toad Locations, Yosemite Toad and Western Toad Map). These occurrences are interesting because they are all over 8,000 feet in elevation. The results of the surveys conducted for relicensing of the Lee Vining Hydroelectric Project found a variety of phenotypes, which when compared to the variety of phenotypes seen in western toads are remarkably similar. However, phenotypic expression does mean genetic relatedness. Maier and Mabe (2024) suggested there is potential for hybrids to occur in other areas south of the El Dorado National Forest. The preliminary sampling of toad DNA in the Action Area will add data to the hybrid distribution discussion, but additional studies and samples are likely needed.

4.7.3. WHITEBARK PINE

One federally listed plant species occurs in the Action Area: whitebark pine. The information presented below is a result of literature review, field surveys, and agency consultation.

4.7.3.1. Survey Methods

Special-status plant surveys were floristic in nature and consistent with the Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities (CDFW, 2018). Surveys were performed at appropriate times of year to maximize the probability of detecting special-status plant species, as determined by the literature review and in consultation with the relevant stakeholders. Two rounds of surveys were conducted each year (2022 and 2023) to encompass the blooming/fruitlet period for multiple special-status plant species. Two years of surveys were performed to maximize the chance of detecting special-status plant species.

Surveys were conducted by Psomas Senior Botanist Allison Rudalevige and Consulting Senior Botanist Sandra Leatherman. In 2022, surveys were performed on July 18, 19, 20, 21, and 22 and August 15, 16, 17, 18, and 19. In 2023, surveys were performed on July 24, 25, 26, and 27 and August 18, 19, 20, and 22. The total number of person hours spent surveying was approximately 110 hours in 2022 and 85 hours in 2023. A systematic, pedestrian survey was conducted throughout the botanical resources study area in all areas of suitable plant habitat. Inaccessible areas were viewed via binoculars. A field map with the botanical resources study area overlaid on aerial imagery (USGS, 2020) was prepared at a scale of 1 inch equal to 150 feet (1"=150').

Plant species were identified in the field or collected for future identification. At the time of this technical report, voucher specimens are in the process of being deposited in an approved herbarium that is a member of the Consortium of California Herbaria (i.e., at the University of California, Riverside, and the California Botanic Garden). Individuals were collected under the conditions of CDFW and USFS permits.

Plants were identified to the taxonomic level necessary to determine whether they were a special-status species. Identification was made using taxonomic keys, descriptions, and illustrations in Jepson Flora Project (2022), Wilson et al. (2014), Hurd et al. (1998), Wiese (2013), and Breckling and Breckling (2020). Nomenclature of plant taxa conform to the Special Vascular Plants, Bryophytes, and Lichens List (CDFW, 2022b) for special-status species and the Jepson eFlora (Jepson Flora Project, 2022) for all other taxa.

The location of any special-status plant species population observed in the botanical resources study area was recorded with either a handheld Garmin GPS unit or on an iPad loaded with Avenza Maps software displaying the field map. Horizontal mapping accuracy ranged from approximately 10 to 30 feet. The number of individuals was collected for non-clonal species (estimated for large populations), and the area and percentage of cover were mapped for clonal species. Data were collected on the phenology of individuals and microsite characteristics (e.g., slope, aspect, soil texture, surrounding habitat, and associated species). At the request of the resource agencies, locations of black cottonwood (*Populus trichocarpa*) were also recorded.

4.7.3.2. Literature Review

A literature review was conducted to identify special-status plant species reported to occur (or that historically occurred) in the vicinity of the botanical resources study area. This literature review also verified the protective status of any of the previously identified special-status plants and reviewed any new literature on the ecology and life history of these resources. The literature review was used to define potentially suitable habitat for special-status plant species and determine which species have potential to occur in the botanical resources study area based on the presence of suitable habitat.

A list of special-status plant species was compiled from several sources by searching the following U.S. Geological Survey (USGS) 7.5-minute topographic quadrangles: Tioga Pass, Mount Dana, Lee Vining, Falls Ridge, Lundy, Dunderberg Peak, Vogelsang Peak, Koip Peak, Matterhorn Peak, and Tenaya Lake.

The sources queried included:

- CNDDDB (CDFW, 2020)
- California Native Plant Society (CNPS) Inventory of Rare and Endangered Plants (CNPS, 2020)
- Persistence Analysis for Species of Conservation Concern (INF, 2019); species known to be present in the Mono Ranger District are included
- USFS records of botany at-risk species (Natural Resources Manager, 2018)
- Whitebark pine range geospatial data (USFS, 2020b)

4.7.3.3. Agency Consultation

See Section 2.0, Consultation History, of this BA. No additional consultation was undertaken for whitebark pine.

4.7.3.4. Overall Status and Threats

The USFWS (2022) has determined the whitebark pine is a threatened species based on five factors:

- A. The present or threatened destruction, modification, or curtailment of its habitat or range;
- B. overutilization for commercial, recreational, scientific, or educational purposes;
- C. disease or predation;
- D. the inadequacy of existing regulatory mechanisms; or

E. other natural or manmade factors affecting its continued existence.

The USFWS has determined that the primary stressor driving the status of the whitebark pine is white pine blister rust, a fungal disease caused by the nonnative pathogen *Cronartium ribicola* (Factor C). Whitebark pine is also impacted by the mountain pine beetle (*Dendroctonus ponderosae*) (Factor C), altered fire regimes (Factor E), and the effects of climate change (Factor E).

4.7.3.5. Listing Status

Whitebark pine is listed as Threatened under the federal ESA and is designated as a Species of Conservation Concern by the INF. Federal listing was finalized on December 15, 2022, effective January 17, 2023 (USFWS, 2022). The USFWS did not designate critical habitat for the species as part of the listing because 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, while the mountain pine beetle (*Dendroctonus ponderosae*), altered fire regimes, and climate change are additional threats (USFWS, 2022).

4.7.3.6. Description of the Species

This evergreen tree is monoecious (i.e., containing both male and female cones) (USFWS, 2021). Whitebark pine is the only stone pine (named for their stone-like seeds) in North America. Seeds are not wind disseminated, and primary seed dispersal occurs almost exclusively by Clark's nutcrackers (*Nucifraga columbiana*). Seeds may take between 2 and 11 years to germinate. They may persist for multiple years as seedlings, then saplings, depending on growing conditions. Mature individuals produce cones and may live hundreds of years. They typically grow from 16 to 66 feet tall with a rounded or irregularly spreading crown. Above the tree line, they grow in a krummholz form (i.e., stunted and shrub-like).

4.7.3.7. Current Range and Distribution

Whitebark pine has occurred in western North America for the past 8,000 years, ranging in latitude from 36 degrees north in California to 55 degrees north in British Columbia, Canada, and ranging in longitude from 128 degrees in British Columbia to 108 degrees west in Wyoming (USFWS, 2021). 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 (Jepson Flora Project, 2020). It occurs at high-elevation or high-latitude sites; the upper elevational limits decrease with increasing latitude throughout its range. The elevational limits range from approximately 2,950 feet amsl at northern latitudes to 12,000 feet amsl in the Sierra Nevada (USFWS, 2021). In California, it occurs between approximately 6,500 and 12,100 feet amsl (Jepson Flora Project, 2020).

4.7.3.1. 2022 Results

Twenty-four populations of whitebark pine totaling approximately 1,069 individuals were observed in the botanical resources study area. Populations were observed in the Rhinedollar Dam and Penstock Trail, Saddlebag Dam and Campgrounds, Ellery Lake Campground, Sawmill Campground, Tioga Dam and Auxiliary Dam, and Tioga Lake Campground portions of the study area. Populations 1 through 17 were documented in 2022.

4.7.3.2. 2023 Results

Results of the 2023 field surveys are reported in Table 4.7-6. Populations 1 through 17, initially documented in 2022, were confirmed in 2023. Populations 18 through 24 were documented in 2023.

Table 4.7-6. Population Counts and Phenology of Whitebark Pine in 2022 and 2023 Combined

Botanical Resources Study Area	Population	Number of Individuals	Percent Vegetative	Percent Flowering/ Fruiting	Notes
Rhinedollar Dam/Penstock Trail Exhibit 14e ^a	1	2	50	50	Populations 1 and 2 are inside the FERC Boundary. Population 3 is outside the FERC Boundary, and Population 4 is mainly within the FERC Boundary.
	2	1	100	0	
	3	2	100	0	
	4	300	75	25	
Penstock Trail Exhibit 14e	5	12	33	67	Populations 5 and 6 are within the FERC Boundary.
	6	300	75	25	
Saddlebag Dam and Campground Exhibit 14a	7	30	85	15	Populations 7 and 8 are primarily located in the campground and adjacent concessionaire parking area.
	8	200	75	25	
Ellery Lake Campground Exhibit 14d	9	2	0	100	Populations 9 and 10 are adjacent to the campground and outside the FERC Boundary.
	10	3	33	67	
Upper Lee Vining Creek/west of Sawmill Campground Exhibit 14b	11	17	41	59	Populations 11 and 12 are west and adjacent to the campground but outside the FERC Boundary.
	12	23	78	22	

Botanical Resources Study Area	Population	Number of Individuals	Percent Vegetative	Percent Flowering/ Fruiting	Notes
Tioga Dam/Auxiliary Dam Exhibit 14f	13	10	60	40	Population 13 is adjacent to the FERC Boundary, and Population 14 is inside and outside the FERC Boundary.
	14	74	69	31	
Tioga Lake Campground Exhibit 14f	15	6	17	83	Population 17 is within the campground and outside the FERC Boundary. Populations 15 and 16 are adjacent to the campground and within the FERC Boundary.
	16	9	55	45	
	17	13	85	15	
Saddlebag Dam and Campground Exhibit 14a	18	16	80	20	Populations 18 to 20 are outside the FERC Boundary. Populations 21 to 23 are within the FERC Boundary.
	19	1	100	0	
	20	30	80	20	
	21	14	80	20	
	22	1	100	0	
	23	1	100	0	
West of Junction Campground Exhibit 14c	24	2	100	0	Population 24 is adjacent to Junction Campground and outside the FERC Boundary.

^a On Exhibits 14a-f, the triangles denote individual trees or a small group of trees very close together.

4.7.3.3. Habitat and Life History

Whitebark pine occurs in upper red-fir forest to the timberline, especially in subalpine forests (Jepson Flora Project, 2020). It grows with other conifers such as lodgepole pine (*Pinus contorta*), Engelmann spruce (*Picea engelmannii*), subalpine fir (*Abies lasiocarpa*), and mountain hemlock (*Tsuga mertensiana*) (USFWS, 2021). It grows under a wide range of annual precipitation amounts and is considered relatively drought tolerant. A variety of soil types support whitebark pine; soils are generally well-drained, poorly developed, coarse, rocky, and shallow over bedrock. It requires a variety of ectomycorrhizal fungi in the soil. The species tolerates poor soils, steep slopes, and windy exposures.

There are four stages in the life cycle of the whitebark pine: seed, seedling, sapling, and mature trees, also referred to as reproductive adults. Seeds are produced in female cones and, once on the ground, may take 2 years or more, up to 11 years in some cases, to germinate. Germinated seeds become seedlings that are between 3 to 4 inches tall (8 and 10 centimeters) with a taproot that can measure between 5 to 7 inches (13 to 18 centimeters), with 7 to 9 cotyledons, also known as the embryonic first leaves, as documented by Arno and Hoff (1989). Whitebark pine seedlings may persist for multiple years, depending on growing conditions, until reaching the sapling stage of the life cycle.

Whitebark pine saplings persist for few to many years, depending on growing conditions, until they produce male and female cones. Mature reproductive whitebark pines contain both female and male cones, which is known as monoecious reproduction, and can survive on the landscape for hundreds of years. This slow-growing long-lived tree has a life span between 500 years and 1,000 years (Arno and Hoff, 1989; Perkins and Swetnam, 1996), provided it is located in an area with lower competition, such as a more open canopy with low litter depth and high rock cover. Therefore, in addition to the four general needs for all life stages, mature whitebark pine trees require a more open canopy, dispersal of seeds by Clark's nutcracker, two summers of suitable temperatures and precipitation for pollinated cones to mature, and levels of nitrogen and phosphorus that are adequate to restore values after being depleted in masting year (USFWS, 2021).

4.8. STATUS OF CRITICAL HABITAT WITHIN THE ACTION AREA

4.8.1. SIERRA NEVADA BIGHORN SHEEP CRITICAL HABITAT

As part of the species listing under the ESA, USFWS identified PCEs for Sierra Nevada bighorn sheep critical habitat (USFWS, 2008). The USFWS designated a total of 417,577 acres of critical habitat from Mount Warren (Unit 1), just north of the Project Area to Olancha Peak (Unit 12), approximately 135 miles south of the Project Area. Two designated critical habitat units occur in close proximity to the Project. The Mount Warren Unit (Unit 1) occurs to the north of the Project and is comprised of 36,012 acres. Unit 2, the Mount Gibb Unit, is located just to the south of the Project and is comprised of 29,702 acres. These two units are separated by less than a mile along their closest boundary (Exhibit 1b).

Per the USFWS documentation, the PCEs specific to the bighorn sheep physical or biological features and habitat characteristics required to sustain the species' life history processes include, but are not limited to, the following (USFWS, 2008, p. 45557):

- Non-forested habitats or forest openings within the Sierra Nevada from 4,000 feet (1,219 meters) to 14,500 feet (4,420 m) in elevation with steep (greater than or equal to 60 percent slope), rocky slopes that provide for foraging, mating, lambing, predator avoidance, and bedding and that allow for seasonal elevational movements between these areas.
- Presence of a variety of forage plants as indicated by the presence of grasses (e.g., *Achnanthera* spp.; *Elymus* spp.) and browse (e.g., *Ribes* spp.; *Artemisia* spp., *Purshia* spp.) in winter, and grasses, browse, sedges (e.g., *Carex* spp.), and forbs (e.g., *Eriogonum* spp.) in summer.
- Presence of granite outcroppings containing minerals such as sodium, calcium, iron, and phosphorus that could be used as mineral licks to meet nutritional needs.

The following is paraphrased from the Federal Register (USFWS, 2008):

The first PCE provides for the general biotic communities that are known to support Sierra Nevada bighorn sheep habitat in the Sierra Nevada of California. Sierra Nevada bighorn sheep are not known to occur outside of the communities and elevations described in this PCE. This PCE further provides the components necessary for foraging (summer and winter), breeding, lambing, predator avoidance, and bedding, and allows for seasonal elevational movements among these areas.

The second PCE describes the types of food necessary to meet the biological needs of the Sierra Nevada bighorn sheep related to seasonal range movements. Altitudinal migration by Sierra Nevada bighorn sheep allows them to maximize nutrient consumption during the year.

The third PCE provides for additional nutritional needs. Mineral licks provide necessary nutrients, which are important in meeting dietary requirements.

A very small portion of the 1997 FERC Project Boundary (less than 1 acre) is within an area mapped as designated Critical Habitat for Sierra Nevada bighorn sheep. This small parcel lies with the Mount Warren Critical Habitat Unit 1. This parcel of land is proposed to be removed from the FERC Project Boundary.

4.8.2. YOSEMITE TOAD CRITICAL HABITAT

The Action Area falls within Yosemite toad Critical Habitat Unit 5 (USFWS, 2016): Tuolumne Meadows/Cathedral. This unit consists of approximately 56,530 hectares (139,688 acres) and is located within Tuolumne, Mono, Mariposa, and Madera counties, California, both north and south of Highway 120. Land ownership within this unit consists of approximately 56,477 hectares (139,557 acres) of federal land and 53 hectares (131 acres) of private land. The Tuolumne Meadows/Cathedral unit is predominantly within the INF, with area within the Hoover Wilderness and Yosemite National Park. This unit is currently occupied and contains the physical or biological features essential to the conservation of the species. This unit contains a high concentration of Yosemite toad breeding locations, represents a variety of habitat types utilized by the species, has high genetic variability, and, due to the long-term occupancy of this unit, is considered an essential locality for Yosemite toad populations. The Tuolumne Meadows/Cathedral unit is an essential component of the entirety of this critical habitat designation because it provides continuity of habitat between adjacent units, as well as providing for a variety of habitat types necessary to sustain Yosemite toad populations under various climate regimes. The physical or biological features essential to the conservation of the Yosemite toad in the Tuolumne Meadows/Cathedral unit may require special management considerations or protection due to recreational activities. This unit also has threats due to disease, predation, and climate change. Climate change is not considered a manageable threat. The need for special management considerations or protection due to disease and predation is currently undefined due to uncertainty regarding the extent and magnitude of these particular stressors.

As part of the species listing under the ESA, USFWS identified PCEs for Yosemite toad habitat (USFWS, 2016). Per the USFWS documentation, the PCEs specific for the

Yosemite toad's physical or biological features and habitat characteristics required to sustain the species' life history processes are composed of the following:

- **Aquatic breeding habitat.** This habitat consists of bodies of fresh water, including wet meadows, slow-moving streams, shallow ponds, spring systems, and shallow areas of lakes that:
 - o Are typically (or become) inundated during snowmelt;
 - o Hold water for a minimum of 5 weeks, but more typically 7 to 8 weeks; and
 - o Contain sufficient food for tadpole development.

During periods of drought or less-than-average rainfall, these breeding sites may not hold surface water long enough for individual Yosemite toads to complete metamorphosis, but they are still considered essential breeding habitat because they provide habitat in most years.

- **Upland areas.** This habitat consists of areas adjacent to or surrounding breeding habitat up to 0.78 miles (1.26 kilometers) in most cases (that is, depending on surrounding landscape and dispersal barriers), including seeps, springheads, talus and boulders, and areas that provide:
 - o Sufficient cover (including rodent burrows, logs, rocks, and other surface objects) to provide summer refugia;
 - o Foraging habitat;
 - o Adequate prey resources;
 - o Physical structure for predator avoidance;
 - o Overwintering refugia for juvenile and adult Yosemite toads;
 - o Dispersal corridors between aquatic breeding habitats;
 - o Dispersal corridors between breeding habitats and areas of suitable summer and winter refugia and foraging habitat; and/or
 - o The natural hydrologic regime of aquatic habitats (the catchment).

These upland areas should also maintain sufficient water quality to provide for the various life stages of the Yosemite toad and its prey base.

As evinced by the presence of the five populations of Yosemite toads and as demonstrated by the field surveys, the designated critical habitat in the Action Area meets the above criteria. The critical habitat in the Action Area supports the physical and biological features required to sustain the Yosemite toad's life history processes.

4.8.3. WHITEBARK PINE CRITICAL HABITAT

There is no whitebark pine critical habitat in the Project area. Per the USFWS's listing in 2022 (USFWS, 2022):

Habitat is not a limiting factor for this species, and there are no significant habitat-based threats that are now or would in the future limit habitat for the whitebark pine. In light of the particular circumstances of the whitebark pine, we have determined that designation of critical habitat is not prudent.

No critical habitat has been designated for the whitebark pine.

5.0 EFFECTS OF THE ACTION

Effects of the Action refer to the direct and indirect effects on the species or their designated critical habitat by the Proposed Action. The Proposed Action is the issuance of a new license with the following operational modifications:

1. Modification to the existing FERC Project Boundary (Section 3.1.1, FERC Project Boundary Modifications);
2. New proposed MIFs (Section 3.5.2, Water Management); and
3. New or modified environmental measures and plans to protect, maintain, avoid, or minimize adverse effects or enhance environmental resources during routine O&M activities (Section 3.1.2, Project Facilities, and Section 3.5.3, Inspections and Maintenance).

The following text evaluates the effects of the Proposed Action components (outlined above) on the Yosemite toad and Sierra Nevada bighorn sheep and their respective critical habitats.

5.1. EFFECTS ON SPECIES

5.1.1. FERC PROJECT BOUNDARY

The proposed modifications to the FERC Project Boundary involve removing 13.86 acres from the existing FERC Project Boundary that are not currently used for any Project O&M activities. This Proposed Action will not result in any adverse effects to listed species. The proposed modified boundary would remove all portions of the FERC Project Boundary that currently overlap (1 acre) designated critical habitat for Sierra Nevada bighorn sheep.

The proposed modification of the existing FERC Project Boundary will have no direct or indirect effect on either species, Sierra Nevada bighorn sheep or Yosemite toad, or their designated critical habitat. Removal of the 1 acre of Sierra Nevada bighorn sheep designated critical habitat from the FERC boundary would have no direct or indirect effect on the species because the population of Sierra Nevada bighorn sheep in the area has free access to over 66,000 acres of designated critical habitat in Units 1 and 2 at their

disposal; plus, this acre is now no longer subject to occasional SCE vehicle staging. There would be no physical change to the land. The 1 acre currently designated as critical habitat is unmodified and undisturbed, and therefore its value as critical habitat has remained unchanged, and it will return to critical habitat as natural habitat.

The proposed changes to the FERC boundary involve a mapping exercise to better delineate management of lands and incorporate project features into the FERC boundary. The proposed boundary changes would not have a direct or indirect effect on whitebark pine. The Saddlebag Lakes Road boundary change would add whitebark pine populations 18, 19, and 20 to be within the new FERC boundary. The Tioga Lake Roads addition would add more of population 14 to the FERC boundary. There are no whitebark pines in the proposed Ellery Lake Roads changes.

5.1.2. PROPOSED WATER MANAGEMENT

The proposed water management and MIFs were developed to benefit sediment transport and ecological health for fish and aquatic invertebrates. The MIFs allow for increased flows above Ellery Lake (downstream of Saddlebag and Tioga dams) during the spring (refer to Section 3.5.2, Water Management, for details). No changes are proposed for downstream of Poole Powerhouse.

Project operations under the Proposed Action would change managed lake levels and water releases at Tioga and Saddlebag lakes, but managed lake levels and water release rates at Ellery Lake would remain consistent with existing conditions. No suitable habitat for Yosemite toad or Sierra Nevada bighorn sheep occurs at or downstream of Ellery Lake, but areas adjacent to Lee Vining Creek downstream of Saddlebag Reservoir contain habitat suitable for both species.

As compared to the current baseline conditions, the minor flow increases for 3 weeks during wet years and normal years and minor flow decrease proposed during dry years are not likely to impact the Yosemite toad or Sierra Nevada bighorn sheep. Although flow in Lee Vining Creek is fed from Saddlebag Lake; unregulated flow from Slate Creek and other watershed runoff also has substantial influence on flows in Lee Vining Creek. However, based on observations made during field studies (Attachment 2) Yosemite toad occupied ponds off Lee Vining Creek (Locations 16, 18, 19 on Exhibit 9b) are not hydrologically connected to flows from Saddlebag Lake, but are hydrologically reactive to the amount of precipitation in the form of snow and snowmelt from the surrounding meadow. Therefore, there would be no effects to Yosemite toad or Sierra Nevada bighorn sheep anticipated from continued operations at Saddlebag Lake.

The proposed water management changes are of short duration and temporary, occurring just once in the water-year. Changes in the water management early in the growing season would not be expected to have an effect on whitebark pine as a slow growing tree, especially as it is a drought-tolerant, high-elevation adapted species (USFWS, 2022).

5.1.3. ENVIRONMENTAL MEASURES

SCE has identified new or modified environmental measures and plans to protect, maintain, avoid, or minimize adverse effects or enhance environmental resources during routine O&M activities. The majority of these measures are specific to the Yosemite toad. Bighorn sheep are more mobile and not typically observed in the Action Area during O&M activities, thus the Proposed Action is unlikely to impact the species or their critical habitat.

These proposed environmental measures identify education and training measures for SCE staff to avoid and minimize potential adverse effects to Sierra Nevada bighorn sheep, Yosemite toad, and whitebark pine when implementing routine O&M activities in the Action Area. Additional protective measures include modifying some materials used for erosion control near breeding locations. Details of the measures are outlined in Section 3.5.6 (Proposed Avoidance, Minimization, Mitigation, and Conservation Measures) in this BA.

The proposed environmental measures indirectly have a positive impact on Sierra Nevada bighorn sheep, Yosemite toad, and their critical habitat, and whitebark pine within the Action Area. Education, outreach, and new protocols supporting routine O&M activities create additional awareness and knowledge of the resources in the area to protect. These measures indirectly support the existing physical and biological features required to sustain Sierra Nevada bighorn sheep, Yosemite toad, and whitebark pine life history processes. The Action Area provides suitable critical habitat for the Yosemite toad. The Proposed Action will have no adverse effect on the Yosemite toad designated critical habitat.

5.1.4. MAINTENANCE

Maintenance of Project facilities occurs on SCE property within previously disturbed and maintained areas, such as the areas surrounding valve houses and gaging stations. Table 5.1-1 provides a list of Project facilities/structures where routine maintenance is undertaken and closest known Yosemite toad population.

Table 5.1-1. Lee Vining Routine Maintenance Locations: Yosemite Toad

General Location	Facility/Structure	Nearest Yosemite Toad Population
Saddlebag Lake	Saddlebag Dam and concrete spillway	South Pond population Saddlebag Lake: No suitable habitat corridor between dam facilities and Yosemite toad population. See Exhibit 13a, Routine Maintenance Locations.
	Saddlebag valve house	
	Saddlebag gate valve and steel pipe	
	Access roads at Saddlebag Dam	
Tioga Lake	Tioga Dam and spillway	Population T-3, which is located in the western Tioga Lake Meadow along the west side of the lake between the FERC Boundary and Hwy 120. Tioga Lake
	Tioga Auxiliary Dam	
	Tioga valve house	

General Location	Facility/Structure	Nearest Yosemite Toad Population
	Tioga gate valve, steel pipe, trash racks	Campground is situated between this population and the Tioga Auxiliary Dam. See Exhibit 13b.
	Access road at Tioga Dam and Auxiliary Dam	
No Yosemite Toads or Habitat at the Below Facilities.		
Ellery Lake / Rhinedollar Dam	Rhinedollar Dam and spillway with radial gates	--
	Rhinedollar valve house	--
	Tunnel intake with trash racks	--
	Rhinedollar gate valve, Pelton butterfly valve, trash racks	--
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	--

As shown in Table 5.1-1 and Exhibits 13a and 13b, routine maintenance activities are undertaken at areas well away from Yosemite toad breeding locations. These maintenance locations are in areas that have all been previously disturbed by past routine maintenance and inspections. The activities associated with the Proposed Action are not anticipated to have any direct or indirect effect on the Yosemite toad or its designated critical habitats. However, some routine maintenance areas occur in potential dispersal routes for Yosemite toad. See Section 3.5.6.2 for avoidance measures to protect Yosemite toad.

Sierra Nevada bighorn sheep are mobile and not typically observed in the Action Area during maintenance activities, thus the Proposed Action is unlikely to impact the species. Further, no maintenance activities would occur within designated critical habitat for Sierra

Nevada bighorn sheep. The activities associated with the Proposed Action are not anticipated to have any direct or indirect effect on Sierra Nevada bighorn sheep or their designated critical habitat. The removal of the 1 acre of designated critical habitat as stated above in Section 5.1.1 removes designated critical habitat from the FERC boundary and from SCE's maintenance area of responsibility.

Table 5.1-2 provides a list of Project facilities/structures where routine maintenance is undertaken and where whitebark pine populations occur in the vicinity. Exhibits 14a to 14f, Whitebark Pine Locations, illustrate the locations of whitebark pine populations and trees relative to the locations where SCE performs routine maintenance.

Table 5.1-2. Lee Vining Routine Maintenance Locations: Whitebark Pine

General Location	Facility/Structure	Nearest Whitebark Pine Population
Saddlebag Lake	Saddlebag Dam and concrete spillway	Whitebark pine populations and trees identified near access paths below spillway and toe of dam.
	Saddlebag valve house	
	Saddlebag gate valve and steel pipe	Near concessioner and throughout campground and walking paths to values house and steel pipe.
	Access roads at Saddlebag Dam	
Tioga Lake	Tioga Dam and spillway	Whitebark pine populations are located near the Auxiliary Dam and around the Tioga Campground.
	Tioga Auxiliary Dam	
	Tioga valve house	
	Tioga gate valve, steel pipe, trash racks	
	Access road at Tioga Dam and Auxiliary Dam	
Ellery Lake / Rhinedollar Dam	Rhinedollar Dam and spillway with radial gates	Whitebark pine populations and trees known from downstream side of Rhinedollar Dam and from Ellery Lake Campground.
	Rhinedollar valve house	
	Tunnel intake with trash racks	
	Rhinedollar gate valve, Pelton butterfly valve, trash racks	
Poole Powerhouse	Poole Powerhouse	No whitebark pine are known from Poole Powerhouse.
	Turbine	
	Motor-operated gate valve and bypass	
	Tailrace	
	Switchyard	
	Historic housing apartment complex	
	Equipment garage	
	Shop/storage garage	

General Location	Facility/Structure	Nearest Whitebark Pine Population
Other Project Works	Flowline (pipeline and penstock)	Whitebark pine populations are located along Penstock Trail. ^a
	Seven SCE/USGS Gaging stations	No whitebark pine
	<i>Non-Project Transmission Facilities—None, transmission line was removed from license in 2001</i>	No whitebark pine.
	Fiber-optic line to Poole Powerhouse for remote operation	No whitebark pine.

^a O&M activities that occur along Penstock Trail include weed whipping and general vegetation maintenance. See the Lee Vining Resource Management Plan (Attachment 3) for more information about vegetation management.

These maintenance locations are in areas that have all been previously disturbed by past routine maintenance and inspections, and no trimming or removal of whitebark pine is anticipated as part of the Proposed Action. The Project maintenance as part of the Proposed Action is unlikely to directly impact the whitebark pine. See Section 3.5.6.3 for avoidance measures to protect whitebark pine trees, cones, seedlings, and seed banks.

5.1.5. DISPERSED RECREATION

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 Action Area and vicinity. 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). Interactions with Yosemite toads and associated breeding habitat may occur as a result of these activities.

There are four locations of concern where dispersed recreationalists may interact with Yosemite toad habitat or individual toads and dispersed recreation (Exhibit 9b):

- 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 (Exhibit 9b, Locations 11 and 12). However, recreationalists can stray from the trail into the wet meadow, potentially harming individual Yosemite toads interacting with habitat or individuals.
- The second Yosemite toad location along Lee Vining Creek is in an area that shows evidence of frequent use by dispersed recreationalists (Exhibit 9b, Locations 16, 18, and 19).
- The third Yosemite toad location is along the southeast shoreline of Tioga Lake where it intersects a trail regularly used by dispersed recreationalists. Recreationalists using this trail may have the potential to harm individual Yosemite toads (Exhibit 9d, Locations 47 and 48).

- The fourth Yosemite toad location is on the west side of Tioga Lake just South of Tioga Campground (Exhibit 9d, Location 46).

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.

The effects of dispersed recreation on Yosemite toads in the Action Area is unknown. As stated above, recreation is under the purview of the USFS, and effects to the Yosemite toad resulting from recreation would fall under that agency. In 2014, the USFS and USFWS signed a BO that included measures to implement for recreational infrastructure to protect the Yosemite toad (USFWS, 2017).

5.2. EXPOSURE AND RISK ASSESSMENT TO CRITICAL HABITAT

5.2.1. EFFECTS ON SIERRA NEVADA BIGHORN SHEEP CRITICAL HABITAT

There are over 66,000 acres of designated critical habitat in the vicinity of the Action Area. Critical Habitat Unit 1 to the north (surrounding Saddlebag Lake on Exhibit 1b) is comprised of greater than 36,000 acres, and Critical Habitat Unit 2 to the south (south of Ellery Lake on Exhibit 1b) is comprised of greater than 29,000 acres. Exhibit 15, Sierra Nevada Bighorn Sheep Herd Areas, shows the territories currently utilized by Sierra Nevada bighorn sheep in the vicinity of the Action Area. The data for these polygons were provided by CDFW (2025) and are based on GPS collared animals. The Sierra Nevada bighorn sheep herding areas are both located within designated critical habitat. The data indicate that Sierra Nevada bighorn sheep do not utilize the Action Area under routine conditions but occasionally traverse the Action Area. There is currently no data suggesting the Action Area is used as a corridor.

A portion of the existing FERC Project Boundary (less than 1 acre) currently occurs within designated critical habitat for Sierra Nevada bighorn sheep (Exhibit 1b). Under the Proposed Action, that 1 acre of designated critical habitat will be removed from the FERC Project Boundary (see Section 5.1.1). Once accomplished, no Sierra Nevada bighorn sheep critical habitat would remain within the FERC boundary. The proposed changes to the FERC boundary involve a mapping exercise to better delineate land use management and incorporate project features into the FERC boundary. There would be no physical change to the land. The 1 acre currently designated as critical habitat within the FERC boundary is unmodified and undisturbed, and therefore its value as critical habitat will remain unchanged. The designated critical habitat will return as undisturbed, natural land. The Proposed Action would have no effect on the Sierra Nevada bighorn sheep critical habitat or the other habitats utilized by the Sierra Nevada bighorn sheep as illustrated in Exhibit 15. SCE's O&M does not physically have a presence at the higher elevations inhabited by the bighorn sheep, which are typically well above 10,000 feet in elevation during the months when SCE can conduct maintenance (generally June to November). As demonstrated in Table 5.1-1 and Table 5.1-2, SCE's maintenance activities are focused in very narrow and specific areas of the Action Area, especially at facilities that

have designated access routes and parking areas. None of these facilities are located on natural lands that would require ground disturbance.

Based on the analysis in this BA, see Sections 3.5.2 (Water Management) and 3.5.6 (Proposed Avoidance, Minimization, Mitigation, and Conservation Measures), there are no immediate or future effects to the Sierra Nevada bighorn sheep or their designated critical habitat from the Proposed Action.

5.2.2. EFFECTS ON YOSEMITE TOAD CRITICAL HABITAT

The Action Area will consist of a total of 542.25 acres following the completion of the relicensing process (See Section 3.1.1 and Table 3.1-3). The Project sits within designated Critical Habitat Unit 5, which is comprised of 139,000 acres, leaving 138,457.75 acres of designated critical habitat outside of the Action Area.

SCE's Proposed Action (described in Sections 3.5.2 and 3.5.6) would have no effect on Yosemite toad or their designated critical habitat. SCE's maintenance activities occur on previously developed/disturbed land where elements of critical habitat are not supported or present. Operations will be determined by water type year.

Based on the analysis above, the Proposed Action would have no effect on the totality of critical habitat and the Proposed Action would have no effect on Yosemite toad PCEs within designated critical habitat.

Therefore, there would be no immediate or future effects to Yosemite toad designated critical habitat anticipated from the Proposed Action.

5.2.3. EFFECTS ON WHITEBARK PINE CRITICAL HABITAT

The USFWS has not designated critical habitat for whitebark pine; therefore, no effect would occur to whitebark pine critical habitat.

5.3. EFFECTS ON RECOVERY

5.3.1. SIERRA NEVADA BIGHORN SHEEP

The recovery plan for the Sierra Nevada bighorn sheep was prepared by the USFWS and published in 2007 (USFWS, 2007). The recovery plan provides an outline of recovery actions that are intended to lead to the delisting of the species and is now managed by CDFW. The Proposed Action would have no effect on the recovery of the Sierra Nevada bighorn sheep because the Action Area provides a corridor for transient movement between herd territories and does provide critical habitat (Exhibits 1b and 15). In addition, the Proposed Action would have no effect on the surrounding landscape as discussed above in Sections 3.5.2 (Water Management) and 3.5.6 (Proposed Avoidance, Minimization, Mitigation, and Conservation Measures). As SCE's O&M activities do not extend to high elevation habitats and lands utilized by Sierra Nevada bighorn sheep, the activities resulting from the Action would have no effect on the recovery of the Sierra

Nevada bighorn sheep or their critical habitat, nor would it interfere with resource agency goals and objectives to achieve recovery of the species.

5.3.2. YOSEMITE TOAD

There is no Yosemite Toad Recovery Plan published by the USFWS available. However, a Yosemite toad Conservation Assessment (Conservation Assessment) was published as an interagency collaboration by USFS, CDFW, National Park Service, and USFWS in 2015 (Brown et al., 2015). Because the Project is situated on lands managed by the USFS, this section primarily addresses the conservation goals of the USFS and USFWS. The conservation strategy aims to promote and conserve important ecological functions to maintain and expand populations of Yosemite toad including, but not limited to, maintaining and improving water quality, aquatic and riparian habitat, species diversity, habitat and watershed connectivity, and many others.

The Proposed Action as described in this BA is consistent with the Conservation Assessment and would not interfere or prevent the recovery of the Yosemite toad.

5.3.3. WHITEBARK PINE

There is no recovery plan published for the whitebark pine by the USFWS. However, the CNPS (2019) prepared a conservation assessment with management considerations for the whitebark pine.

Research needs and recommendations provided in that report include the following:

- Continued research on evaluating the risk of higher and lower elevation stands of whitebark pine to pests and pathogens
- Revisit previously sampled stands to evaluate if white pine blister rust has spread
- Develop forestry best practices to reduce interspecific competition
- Understand general patterns in regional population genetics across the state
- Study patterns of genetic resistance to white pine blister rust
- Map patterns of vulnerability and resistance to mountain pine beetle
- Understand degree and distribution of resistance to white pine blister rust within populations of whitebark pine in the Sierra Nevada.

The Proposed Action would not affect or interfere with these recommendations, nor would the Proposed Action interfere with or affect management decisions needed to conserve the whitebark pine. Although no management recommendations are made for the INF in general, management efforts to conserve the whitebark pine will need to combine the efforts and strategies from multiple disciplines and sciences, including range science,

genetics, vegetation and forest management, disease control, climate science, public education, and public policy (CNPS, 2019).

6.0 DETERMINATION

Table 5.3-1 indicates the species and critical habitat effects determinations.

Table 5.3-1. Species and Critical Habitat Determinations

Species	Effects Determination
Yosemite toad	Species: No Effect Critical Habitat: No Effect
Sierra Nevada bighorn sheep	Species: No Effect Critical Habitat: No Effect
Whitebark pine	Species: May Affect, But Not Likely to Adversely Affect Critical Habitat: No Critical Habitat designated

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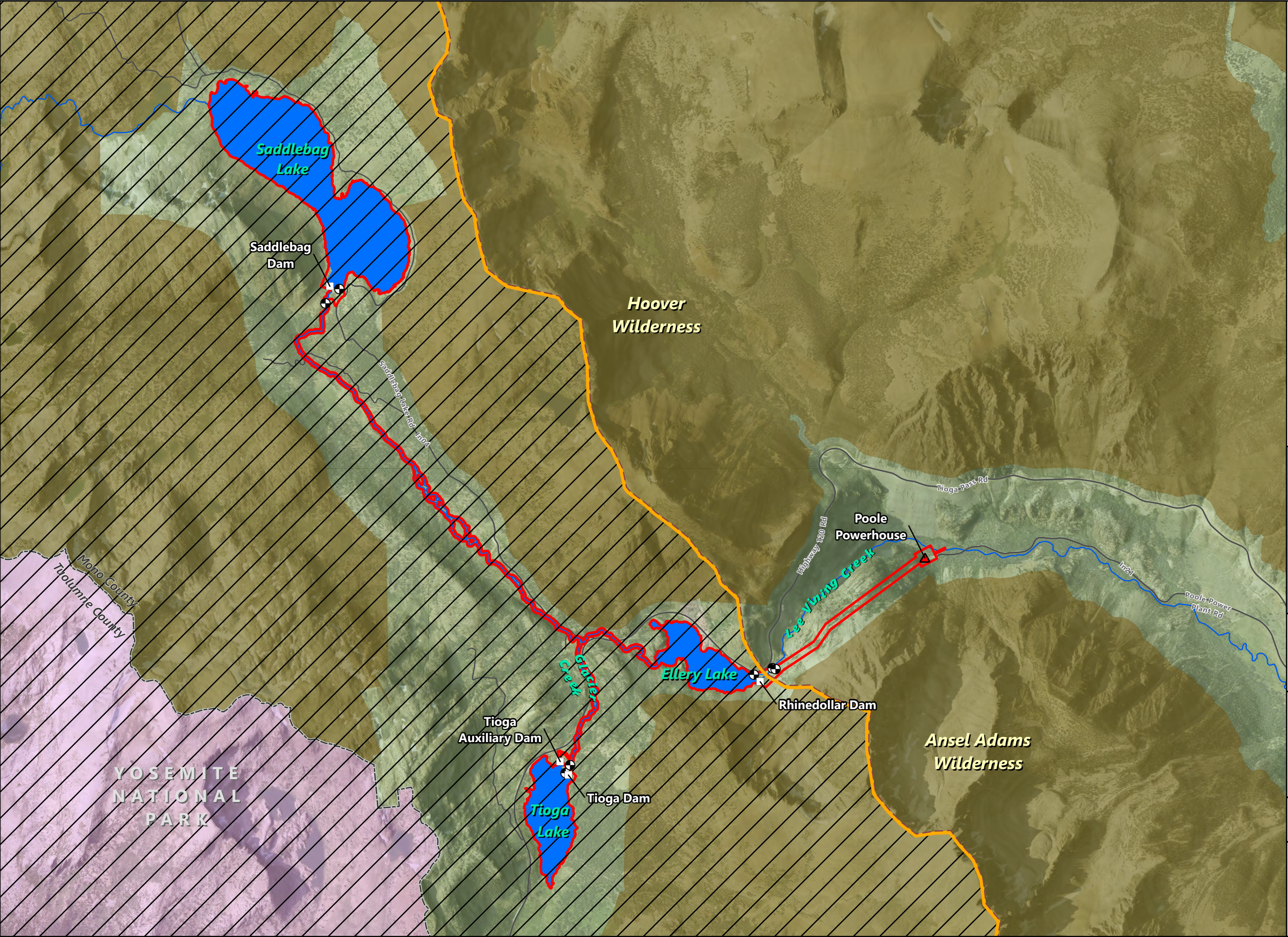
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EXHIBITS 1 – 9d, 11 – 15

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Exhibit 1b	Critical Habitat Sierra Nevada Bighorn Sheep
Exhibit 1c	Whitebark Pine Distribution
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Exhibit 3	Yosemite Toad Study Area
Exhibit 4	Project Features
Exhibit 5a	Proposed FERC Project Boundary Changes at Saddlebag Lake
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Exhibit 15	Sierra Nevada Bighorn Sheep Herd Areas



Dam

Powerhouse

Project Gages

Road

FERC Project Boundary

Inyo National Forest

Wilderness Area (Inyo NF)

Yosemite National Park

County Line

Critical Habitat

Yosemite toad

California

Nevada

Utah

Arizona

SOUTHERN CALIFORNIA

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Exhibit 1a

Critical Habitat

Yosemite Toad

LEE VINING

HYDROELECTRIC PROJECT

FERC PROJECT NO. 1388

N

Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet

Projection: Lambert Conformal Conic

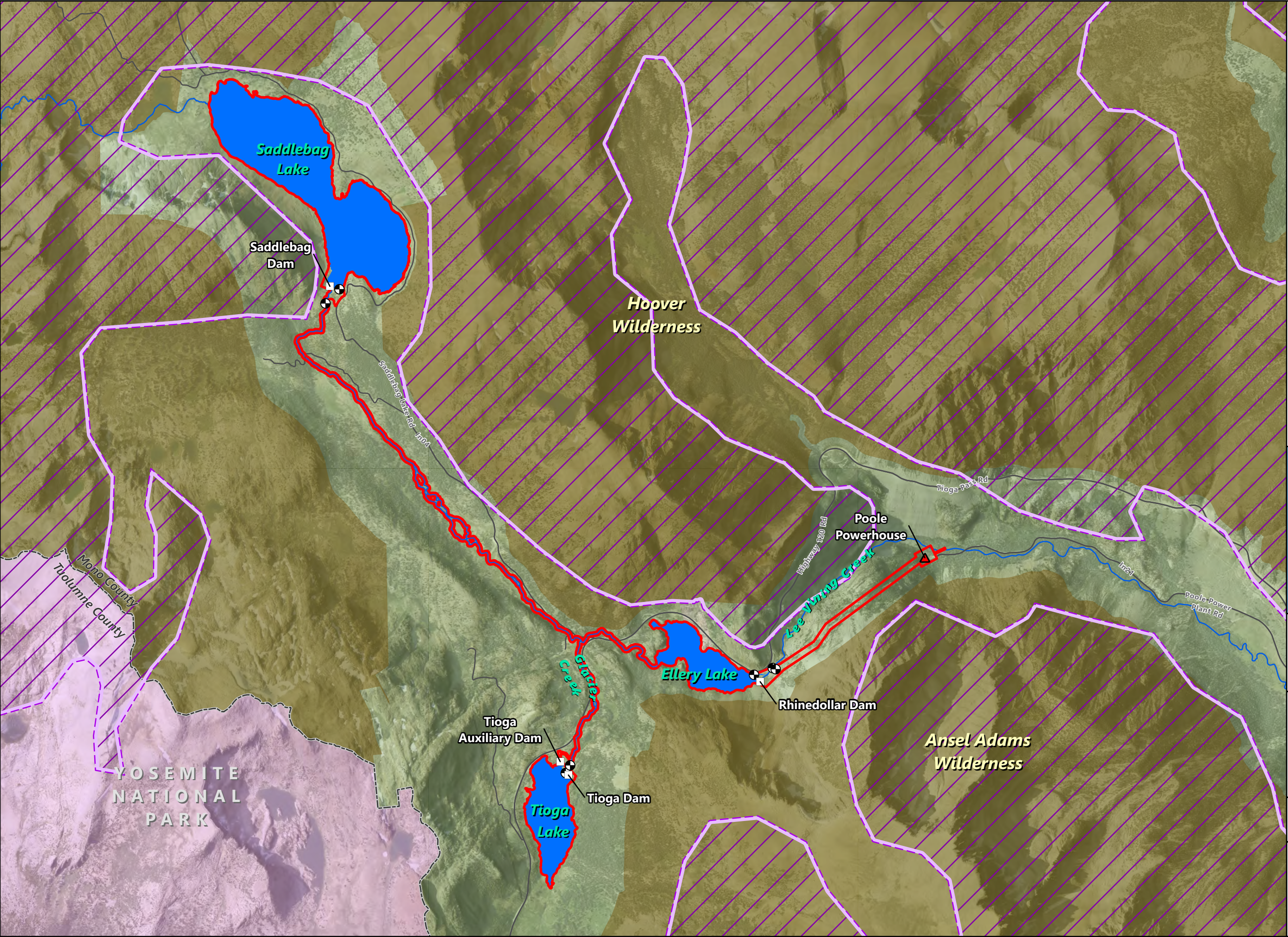
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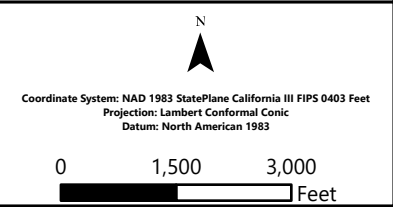


- Dam
- ▲ Powerhouse
- ⊙ Project Gages
- Road
- ▭ FERC Project Boundary
- Wilderness Area (Inyo NF)
- Yosemite National Park
- Inyo National Forest
- ▭ County Line
- Critical Habitat**
 - ▨ Sierra Nevada bighorn sheep



Exhibit 1b
Critical Habitat
Sierra Nevada
Bighorn Sheep

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HYDROELECTRIC PROJECT
FERC PROJECT NO. 1388



Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983



Dam

Powerhouse

Road

FERC Project Boundary

Inyo National Forest

Wilderness Area (Inyo NF)

Yosemite National Park

County Line

Special Status Plant Species Populations 2022

whitebark pine (*Pinus albicaulis*)

Special Status Plant Species Populations 2023

whitebark pine (*Pinus albicaulis*)

Nevada
Utah
California
Arizona

SOUTHERN CALIFORNIA
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Exhibit 1c
Whitebark Pine
Distribution

LEE VINING
HYDROELECTRIC PROJECT
FERC PROJECT NO. 1388

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Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983

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Feet

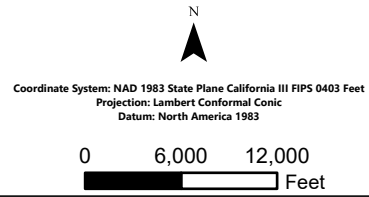


- FERC Project Boundary (P-1388)
- Wilderness Area
- Yosemite National Park
- National Forest Park
- Road
- Inyo NF Trail
- County Line

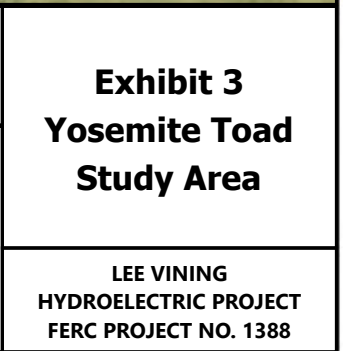
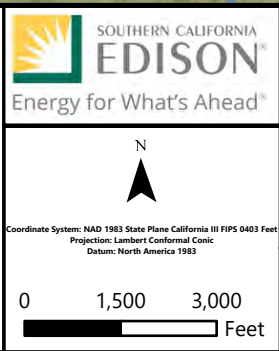
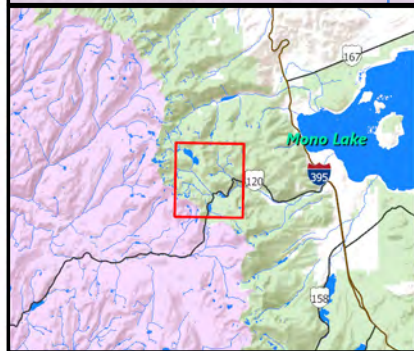
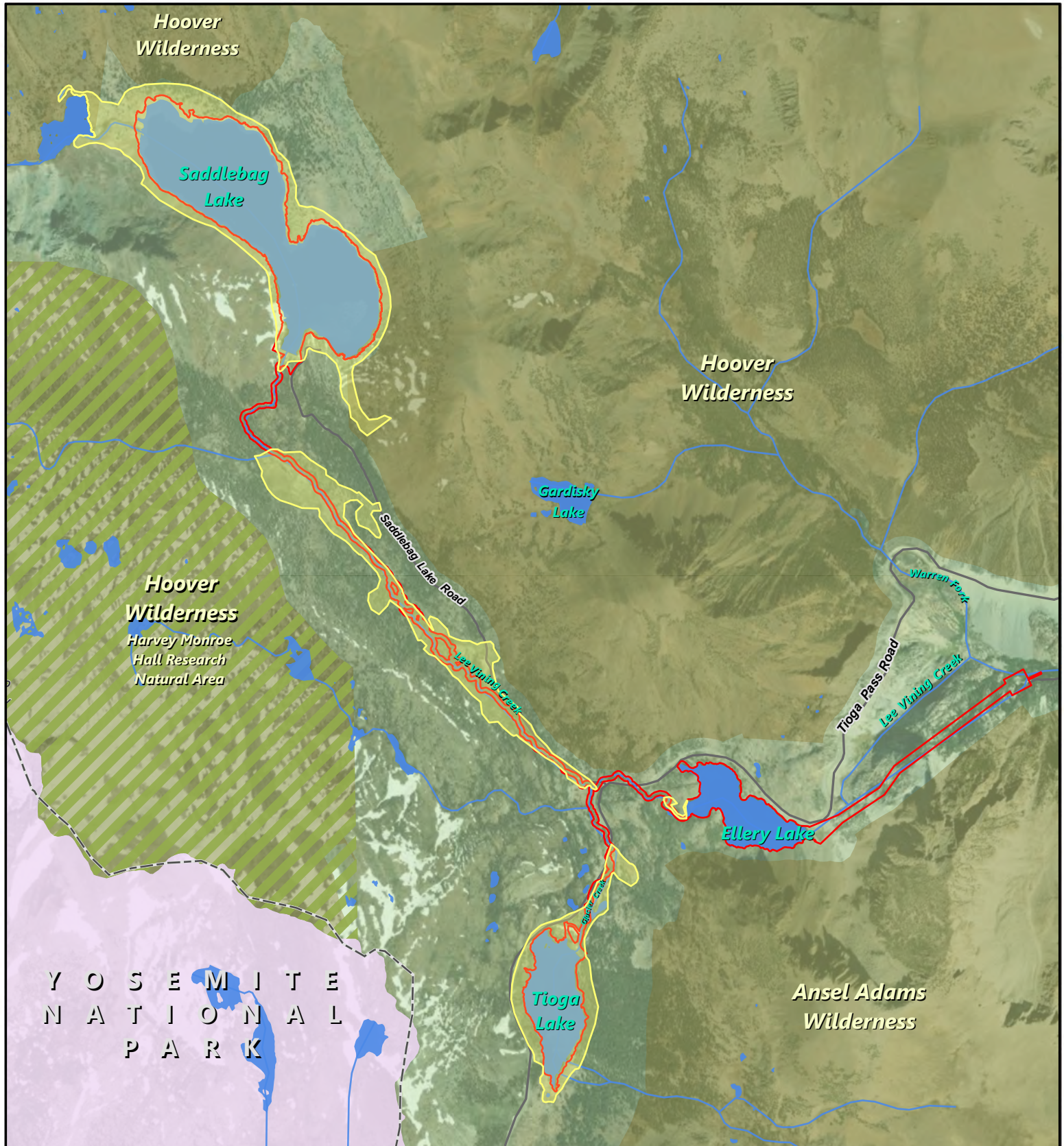


Exhibit 2
Project Location

LEE VINING
HYDROELECTRIC
RELICENSING PROJECT



Coordinate System: NAD 1983 State Plane California III FIPS 0403 Feet
Projection: Lambert Conformal Conic
Datum: North America 1983





- Dam
- Powerhouse
- Project Gages
- Road
- FERC Project Boundary
- Wilderness Area (Inyo NF)
- Yosemite National Park
- Inyo National Forest
- County Line



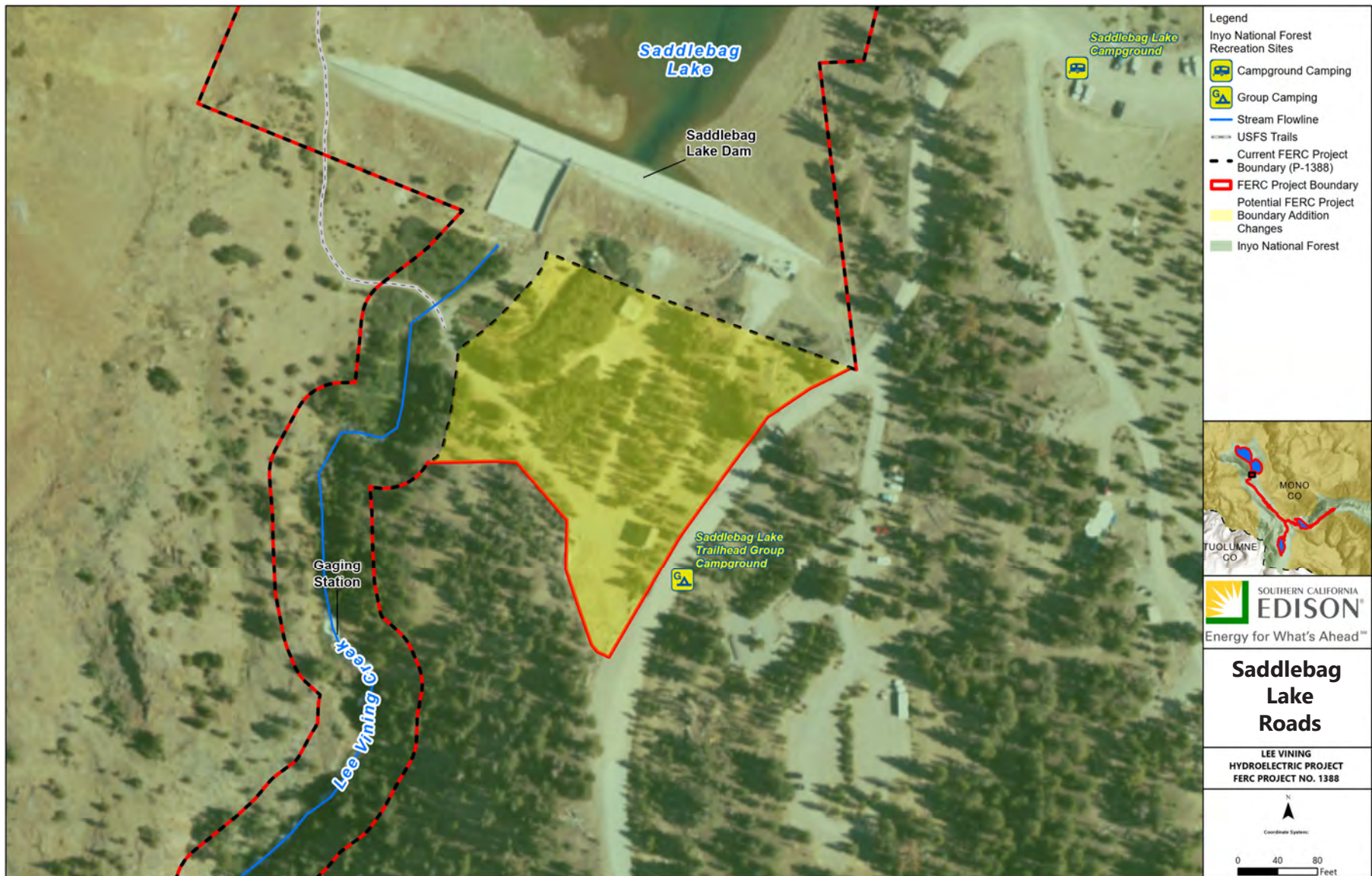
Exhibit 4
Project Features

LEE VINING
HYDROELECTRIC PROJECT
FERC PROJECT NO. 1388

N

Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983

0 1,500 3,000 Feet



Source: Kleinschmidt, 2024

Proposed FERC Project Boundary Changes at Saddlebag Lake

Exhibit 5a

Yosemite Toad Biological Assessment



Map not to scale





Source: Kleinschmidt, 2024

Proposed FERC Project Boundary Changes at Tioga Lake

Exhibit 5b

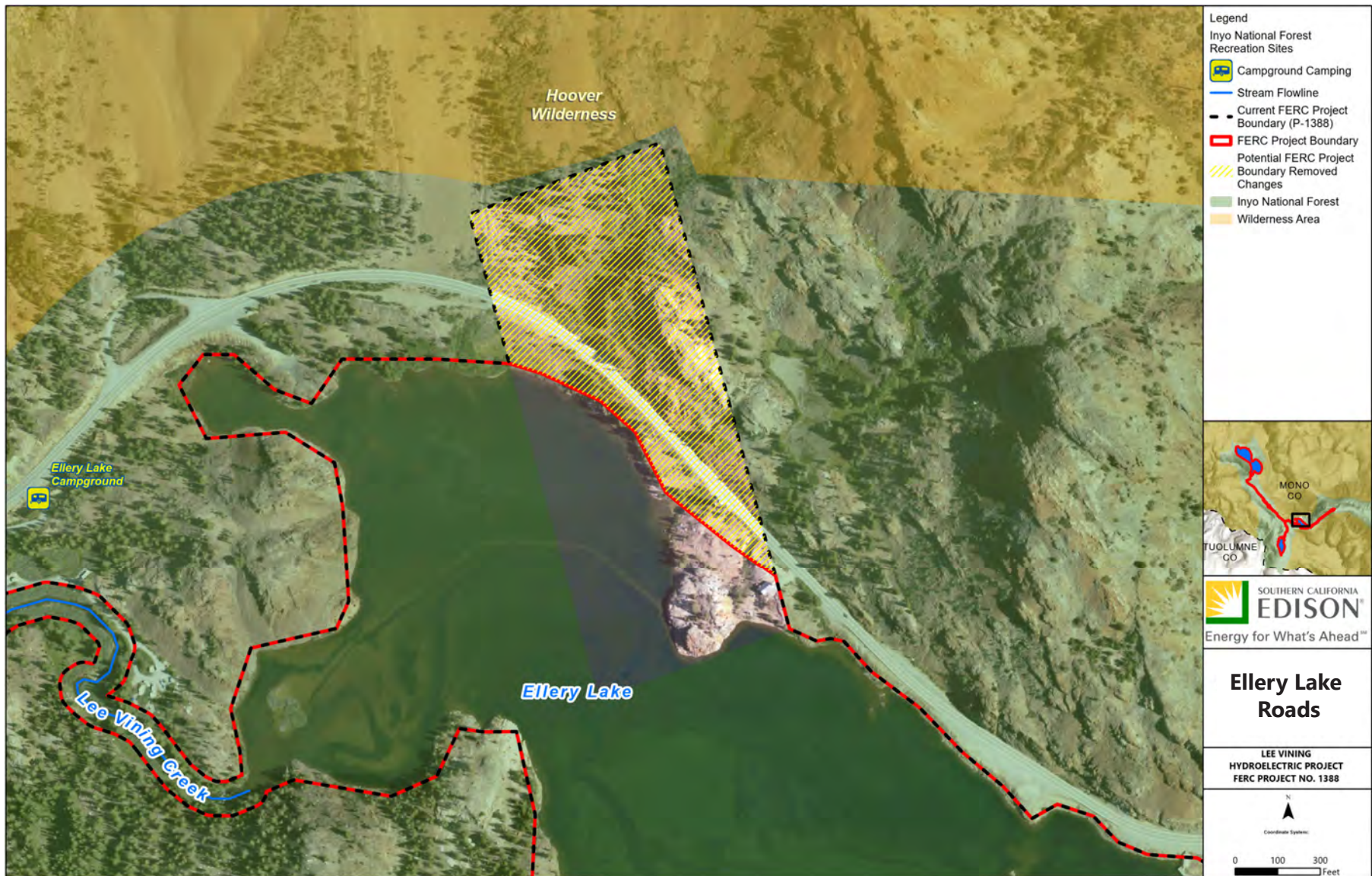
Yosemite Toad Biological Assessment



Map not to scale



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Source: Kleinschmidt, 2024

Proposed FERC Project Boundary Changes at Ellery Lake

Exhibit 5c

Yosemite Toad Biological Assessment



Map not to scale



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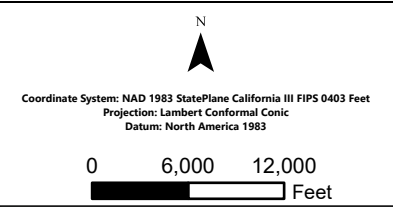


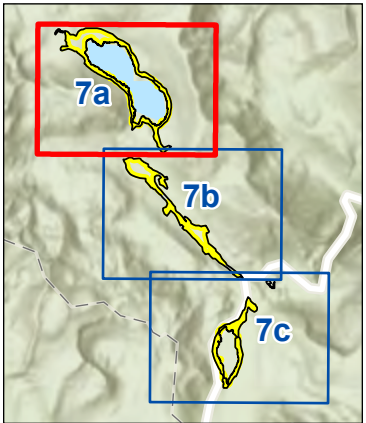
- FERC Project Boundary (P-1388)
- Road
- Inyo NF Trail
- Topo Line
- County Line



Exhibit 6
Mono Basin
Topographic Map

LEE VINING
HYDROELECTRIC
RELICENSING PROJECT





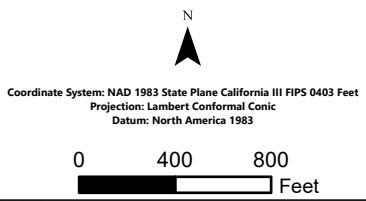
- Study Area
- County Line
- Vegetation Types and Other Areas**
- Alpine Grasses and Forbs
 - Barren
 - Conifer Forest
 - Developed
 - Water
 - Wet Meadow
 - Willow Scrub

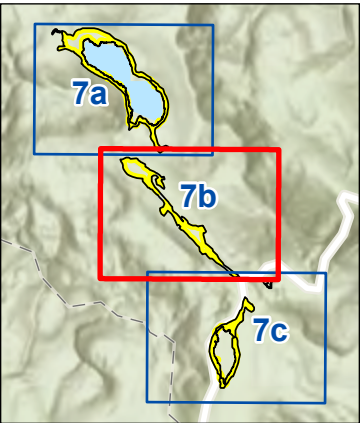
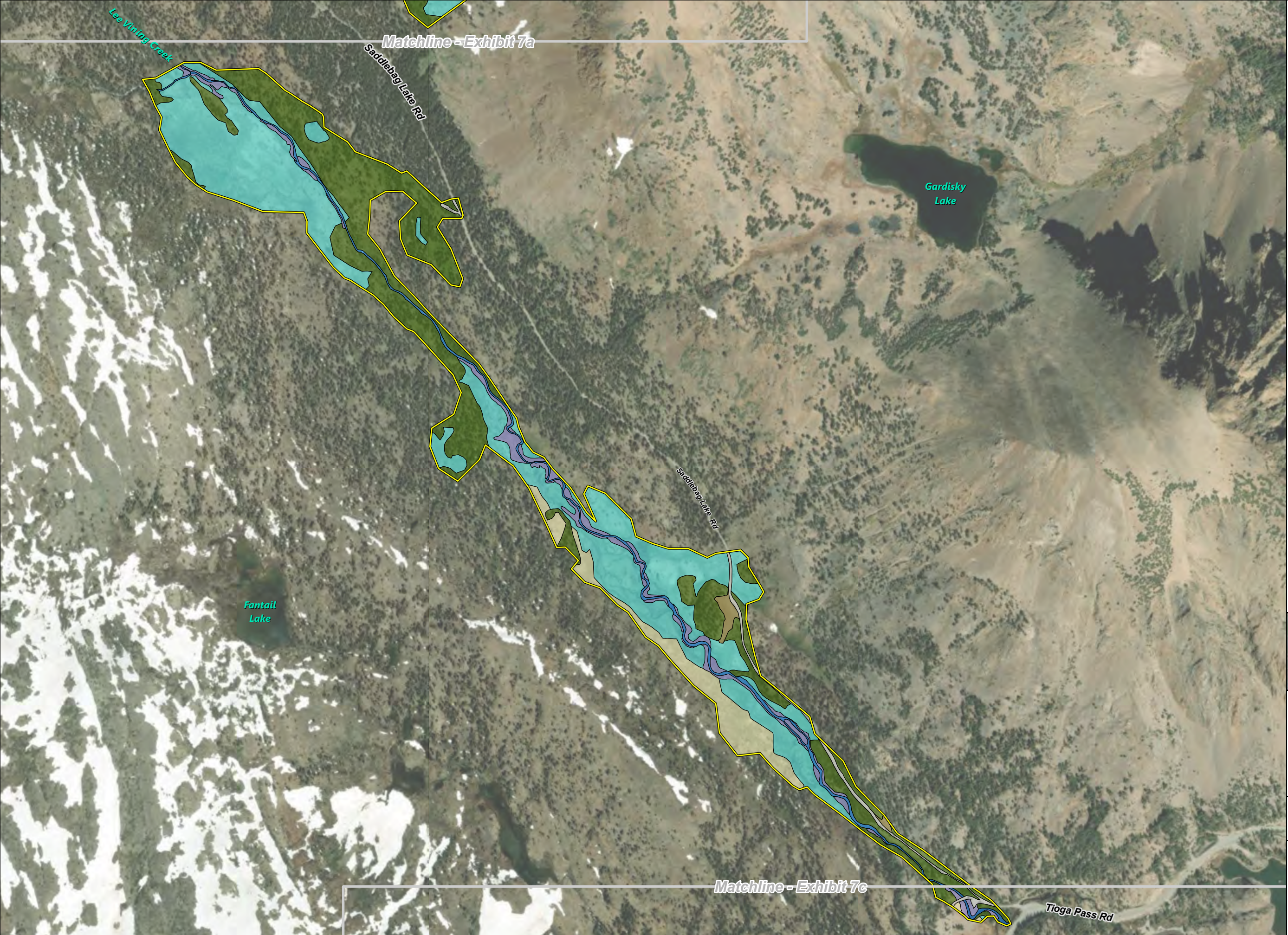


Exhibit 7
Vegetation Map

Page 1 of 3

**LEE VINING
HYDROELECTRIC
RELICENSING PROJECT**





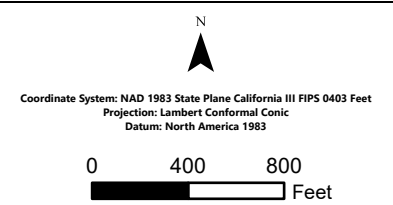
- Study Area
- County Line
- Vegetation Types and Other Areas**
- Alpine Grasses and Forbs
 - Barren
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 - Developed
 - Water
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 - Willow Scrub



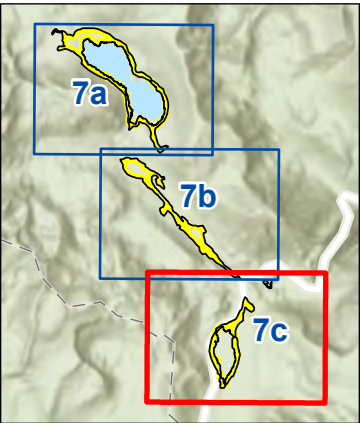
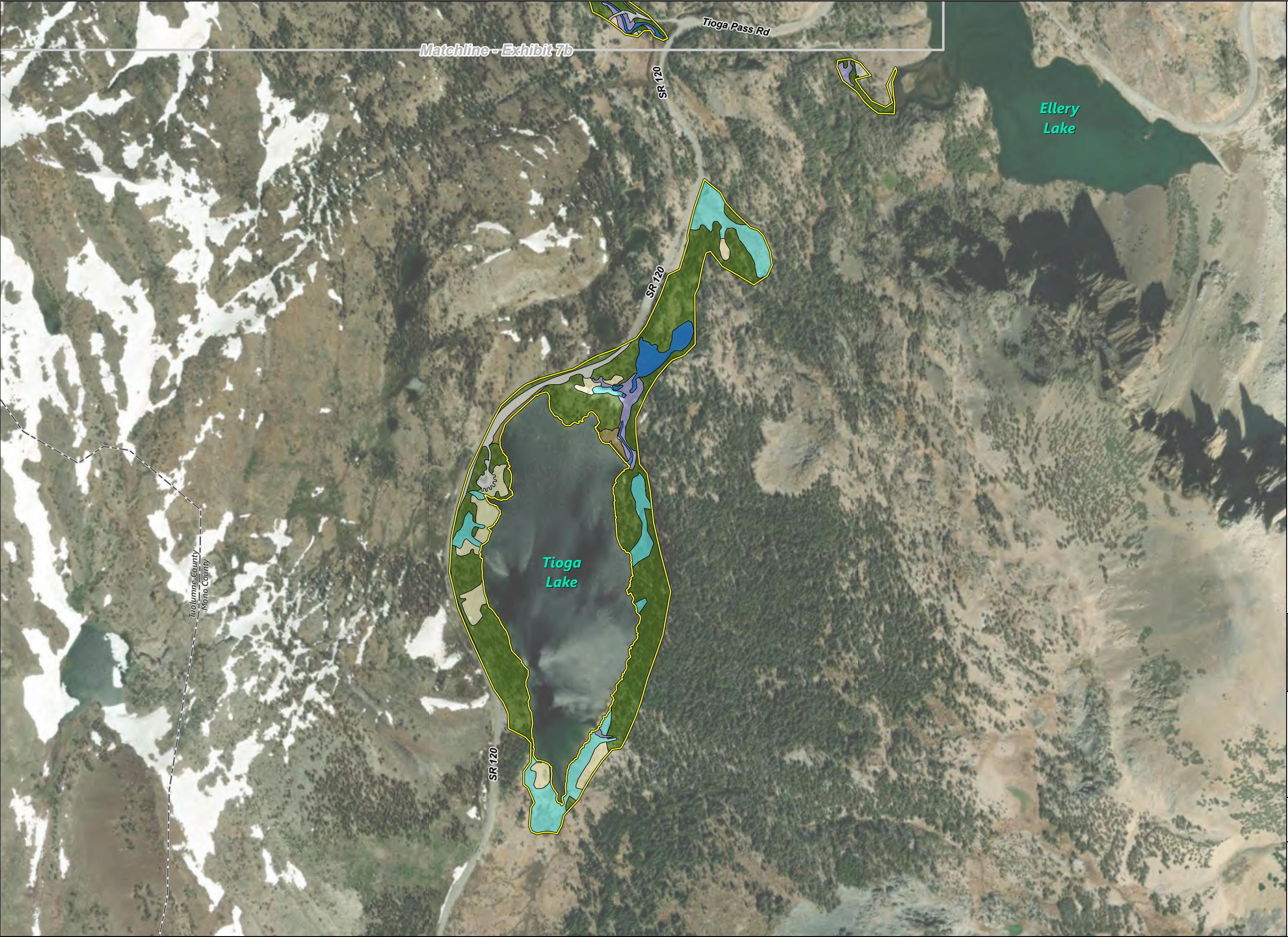
Exhibit 7
Vegetation Map

Page 2 of 3

**LEE VINING
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RELICENSING PROJECT**



Coordinate System: NAD 1983 State Plane California III FIPS 0403 Feet
Projection: Lambert Conformal Conic
Datum: North America 1983



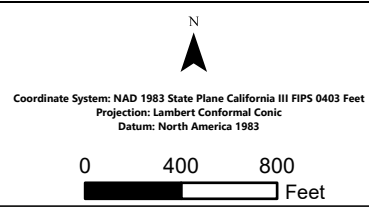
- Study Area
- County Line
- Vegetation Types and Other Areas**
 - Alpine Grasses and Forbs
 - Barren
 - Conifer Forest
 - Developed
 - Water
 - Wet Meadow
 - Willow Scrub



Exhibit 7
Vegetation Map

Page 3 of 3

**LEE VINING
HYDROELECTRIC
RELICENSING PROJECT**



Coordinate System: NAD 1983 State Plane California III FIPS 0403 Feet
Projection: Lambert Conformal Conic
Datum: North America 1983

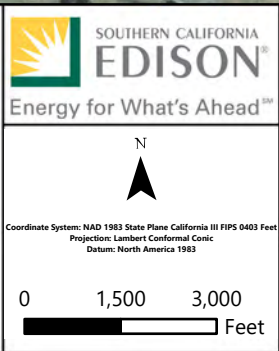
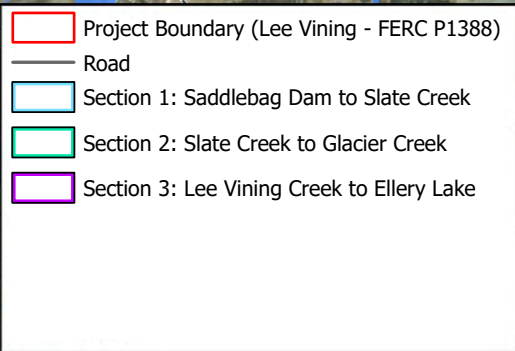
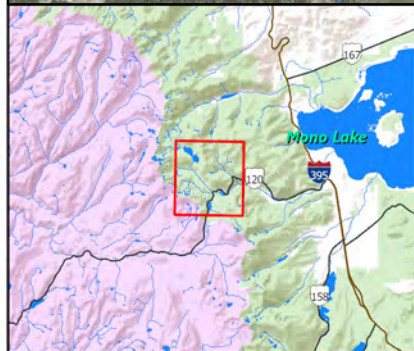
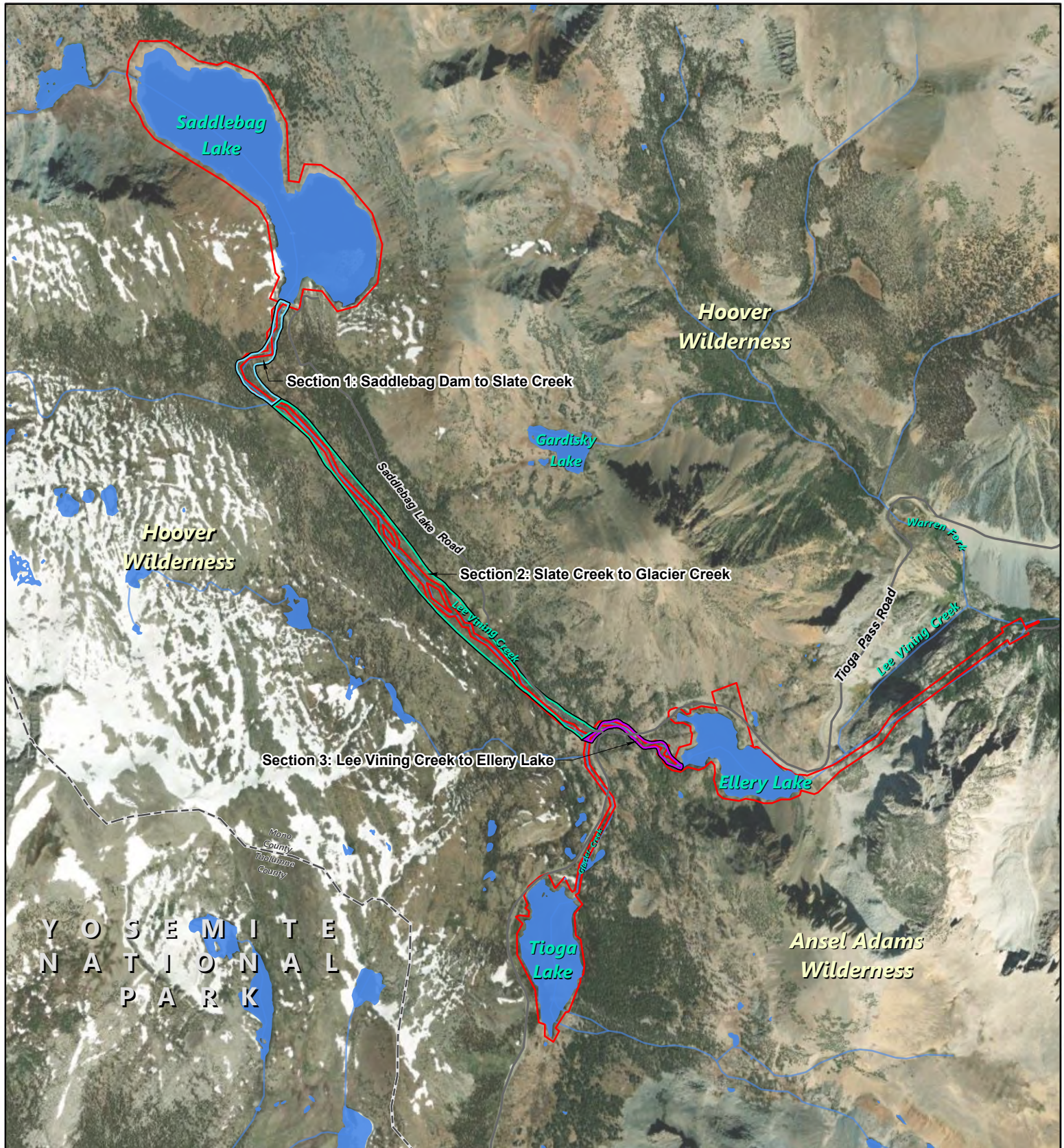
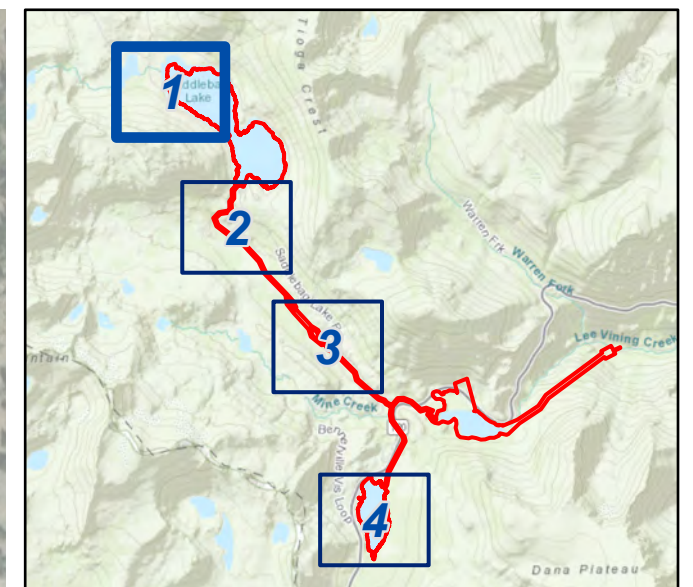
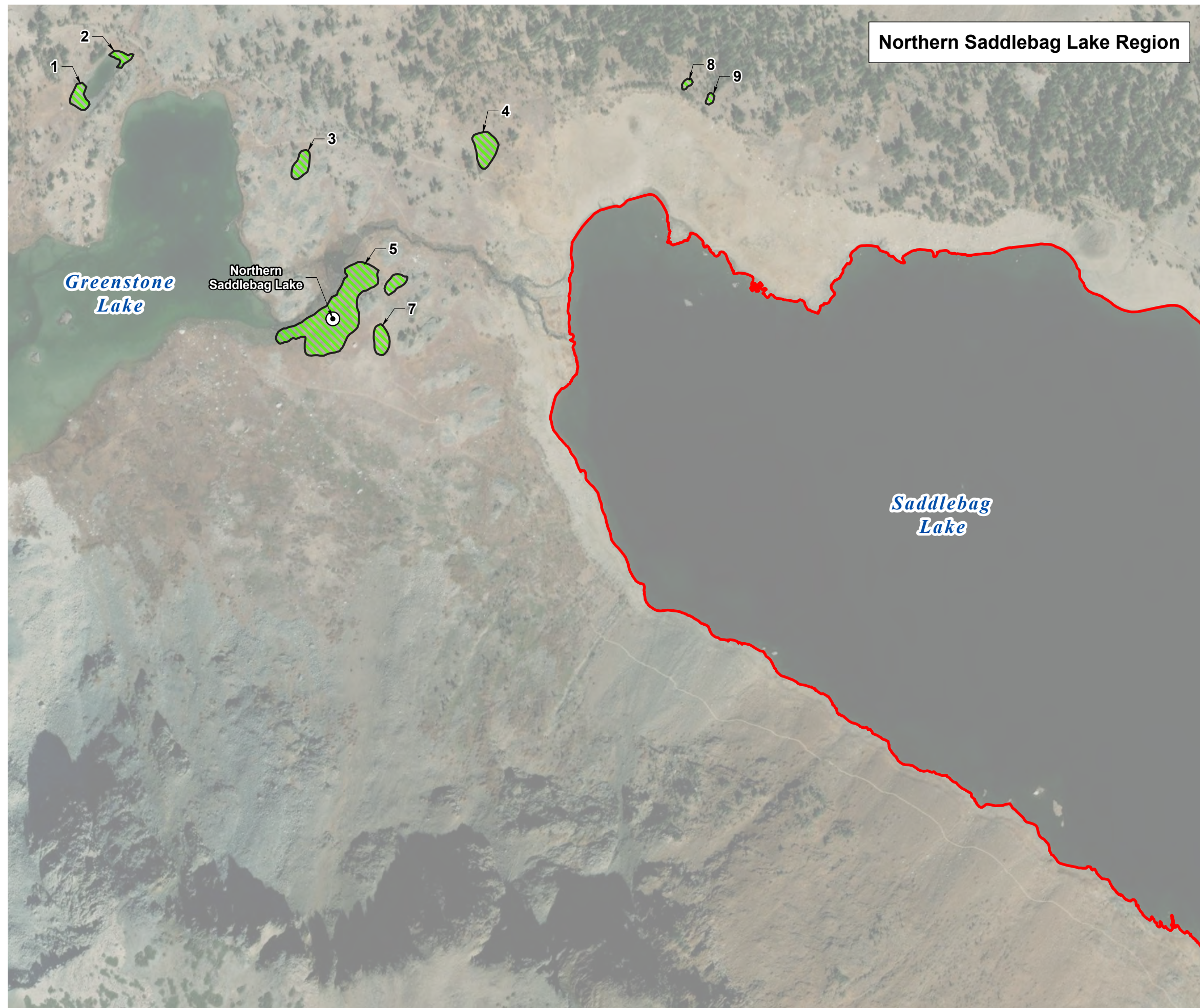


Exhibit 8

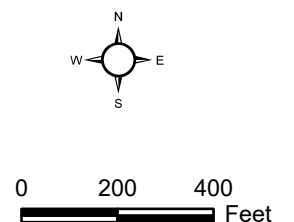
Upper Lee Vining Creek Sections

LEE VINING
HYDROELECTRIC PROJECT
FERC PROJECT NO. 1388

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- FERC Project Boundary
- Acoustic Detector
- YOTO Occupied Potential Habitat**
- Potential Breeding Habitat Observed
- Occupied, Toad Breeding Observed



Aerial Source: ESRI, Maxar 2022

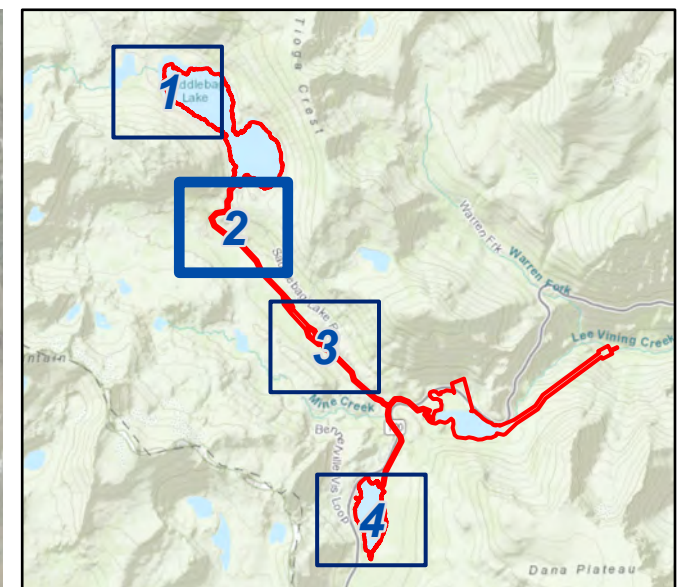
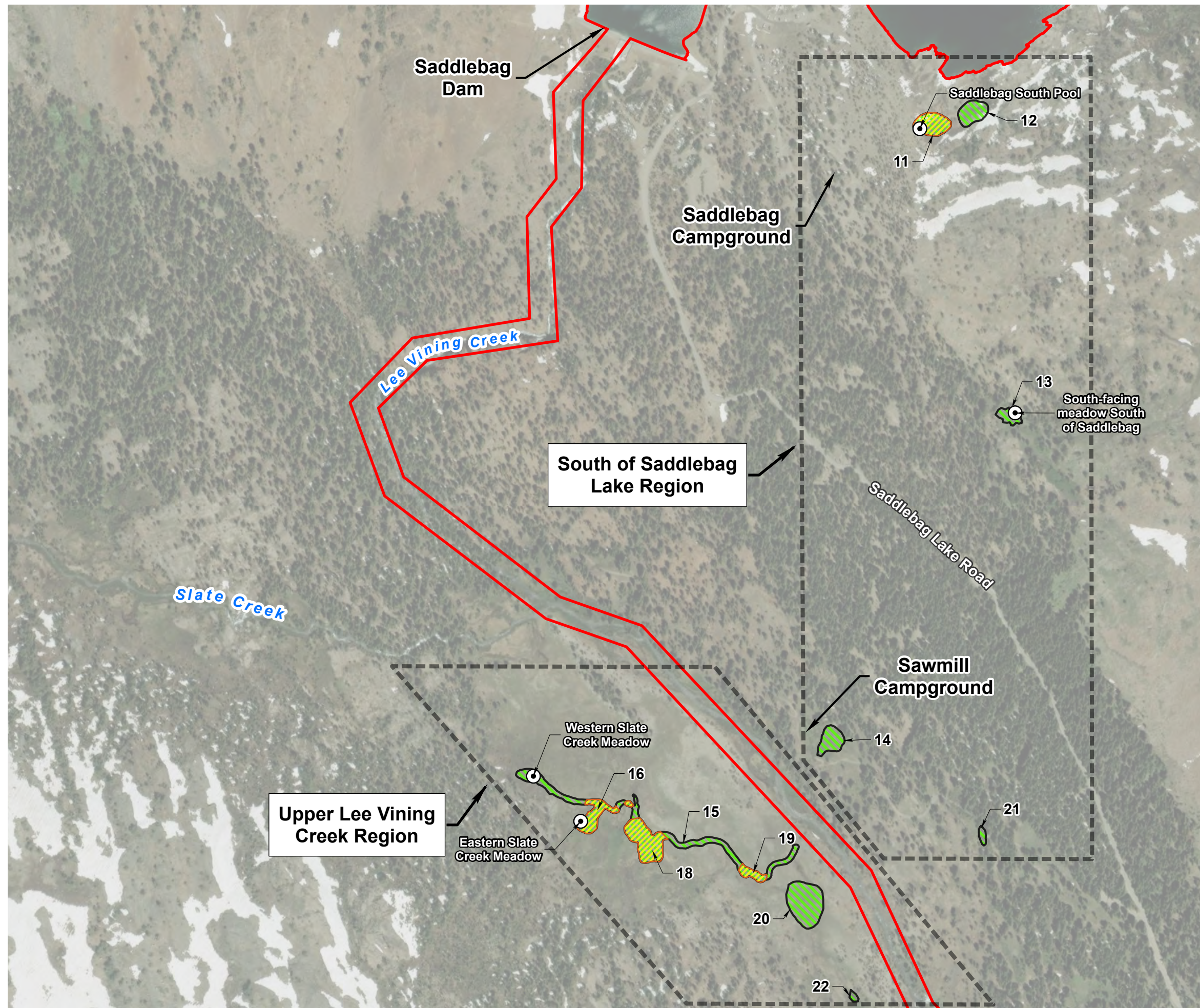
Survey Results
*Lee Vining Hydroelectric
Relicensing Project*

Exhibit 9a

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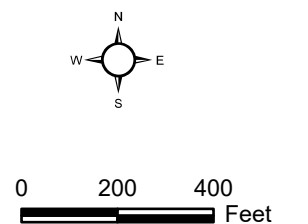
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- FERC Project Boundary
- C

 Acoustic Detector
- YOTO Occupied Potential Habitat**
- Potential Breeding Habitat Observed
- Occupied, Toad Breeding Observed



Aerial Source: ESRI, Maxar 2022

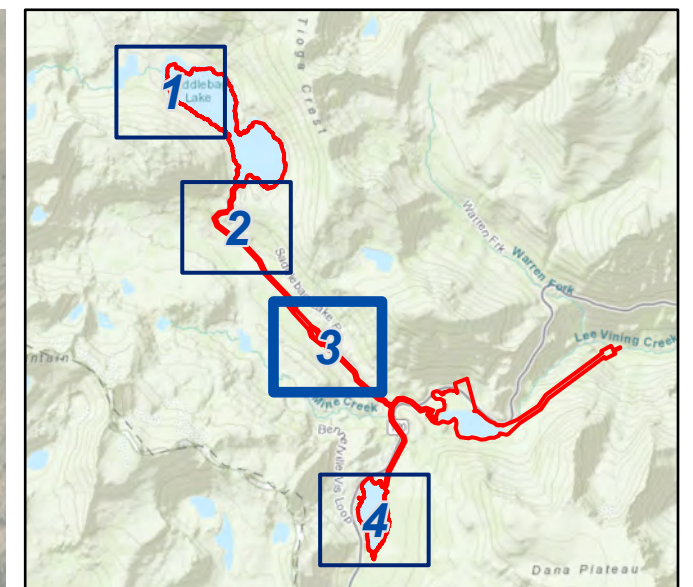
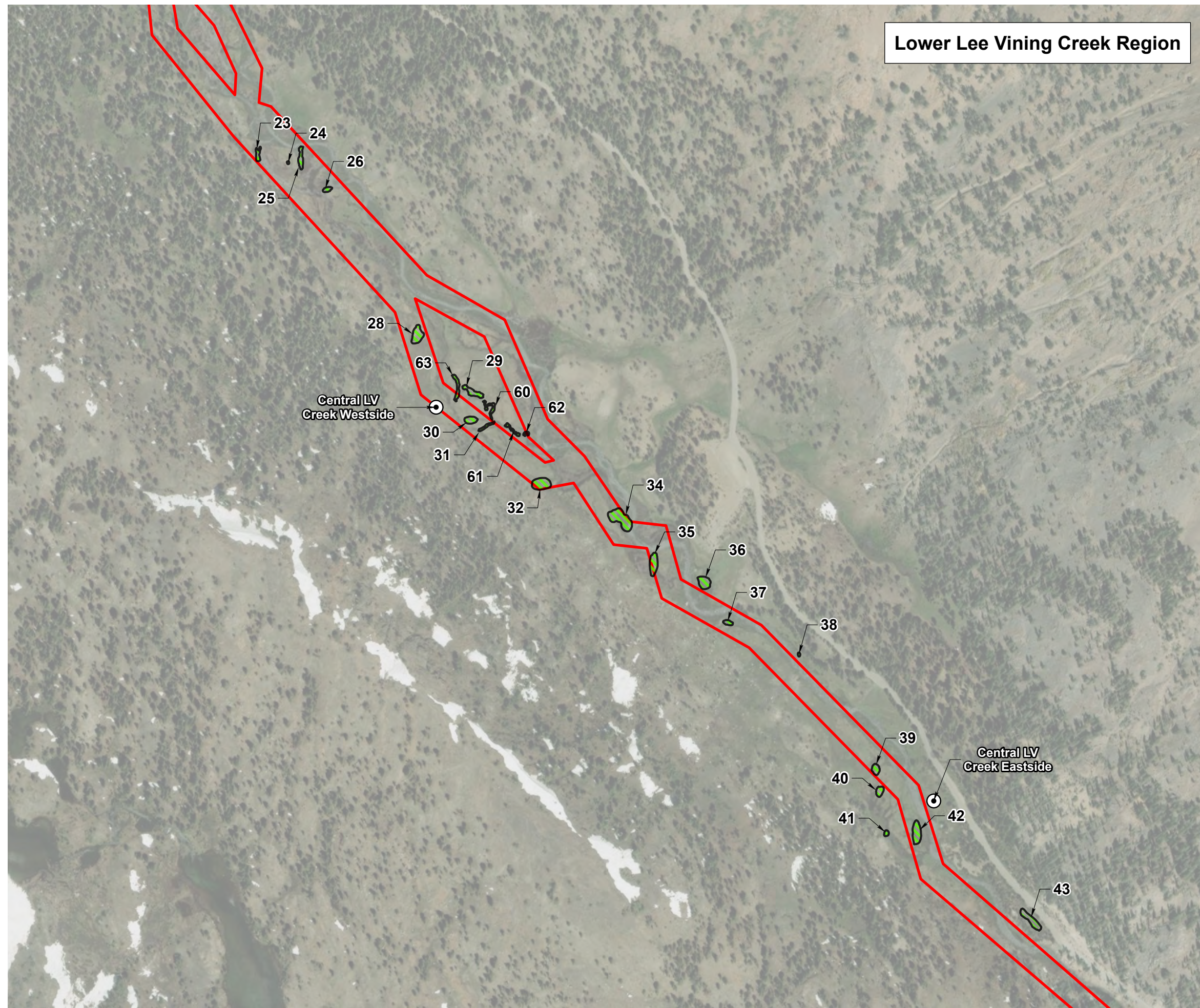
Survey Results
*Lee Vining Hydroelectric
Relicensing Project*

Exhibit 9b

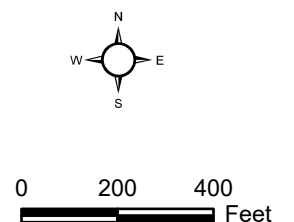
Energy for What's Ahead®

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- FERC Project Boundary
- Acoustic Detector
- YOTO Occupied Potential Habitat**
- Potential Breeding Habitat Observed
- Occupied, Toad Breeding Observed



Aerial Source: ESRI, Maxar 2022

Survey Results

Lee Vining Hydroelectric Relicensing Project

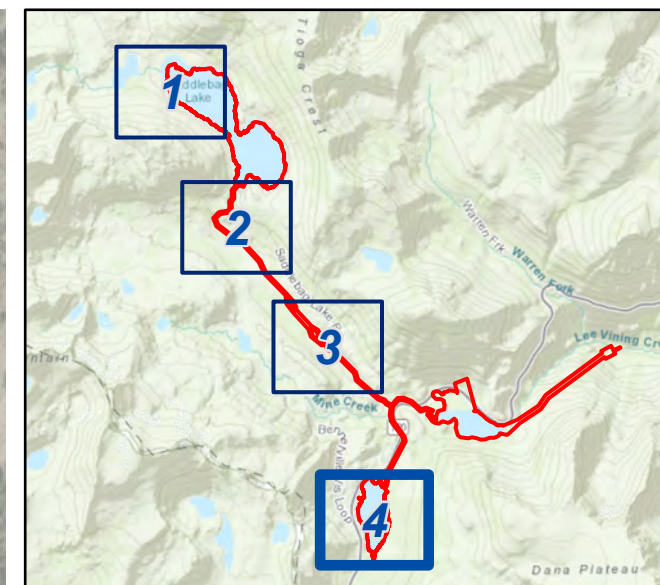
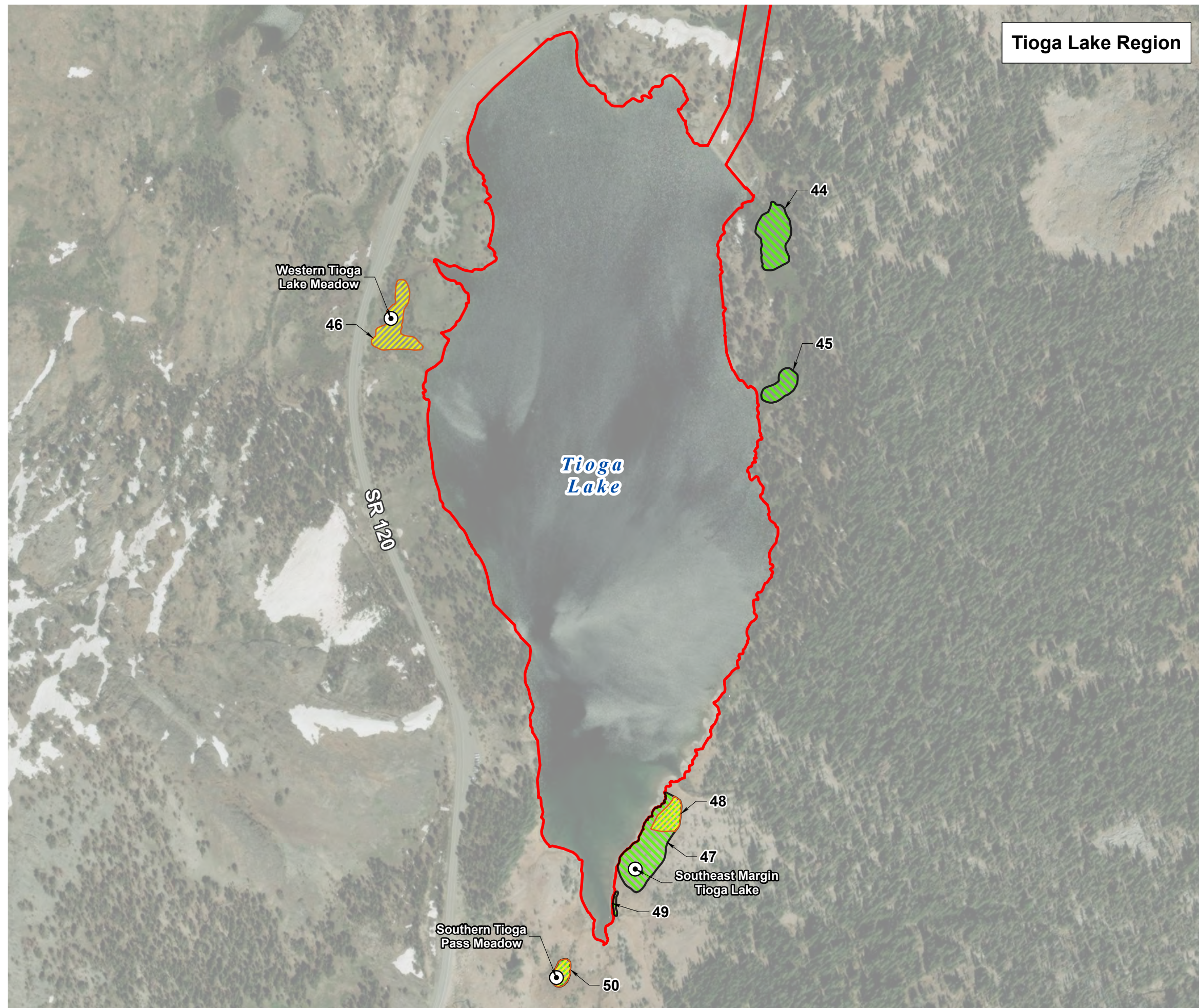
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Exhibit 9c

SOUTHERN CALIFORNIA EDISON®

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FERC Project Boundary

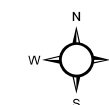
Acoustic Detector

YOTO Occupied Potential Habitat

Potential Breeding Habitat Observed

Occupied, Toad Breeding Observed

** The FERC Boundary shown on this figure is based on existing Exhibit G data on file with FERC. Due to improvements in GIS system technology, the FERC Project Boundary has been updated as shown in Exhibit G of this DLA. This proposed Project Boundary more closely follows the Tioga Lake shoreline. The breeding habitat data collected in the field is outside the proposed FERC Project Boundary. This refined (proposed) FERC Boundary will be more accurately depicted in the FLA and future documents.*



0 200 400
Feet

Aerial Source: ESRI, Maxar 2022

Survey Results

Lee Vining Hydroelectric
Relicensing Project

Exhibit 9d



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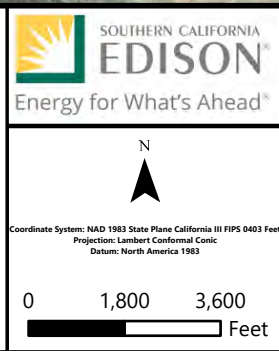
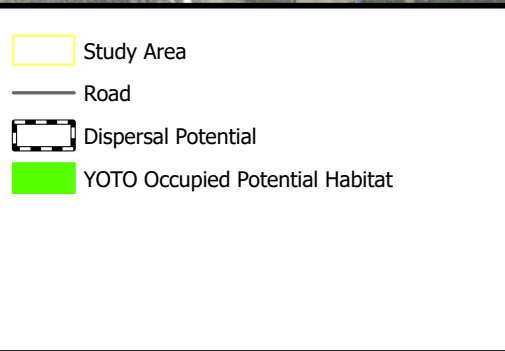
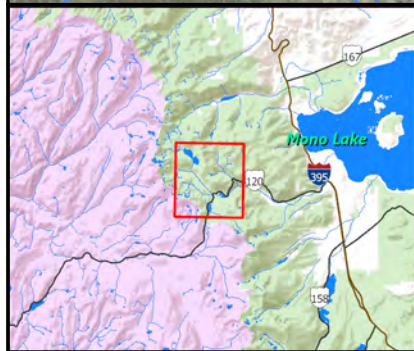
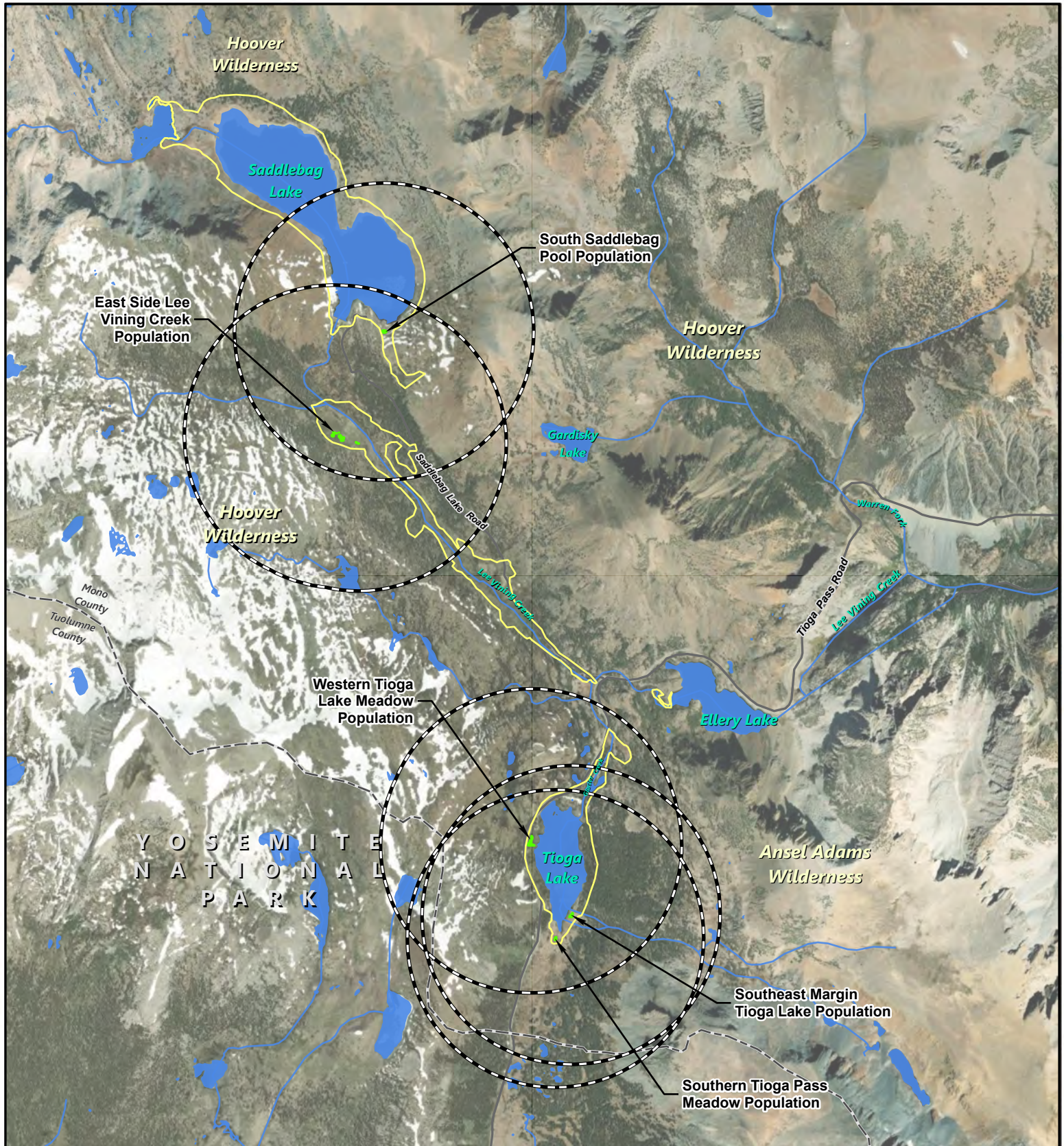
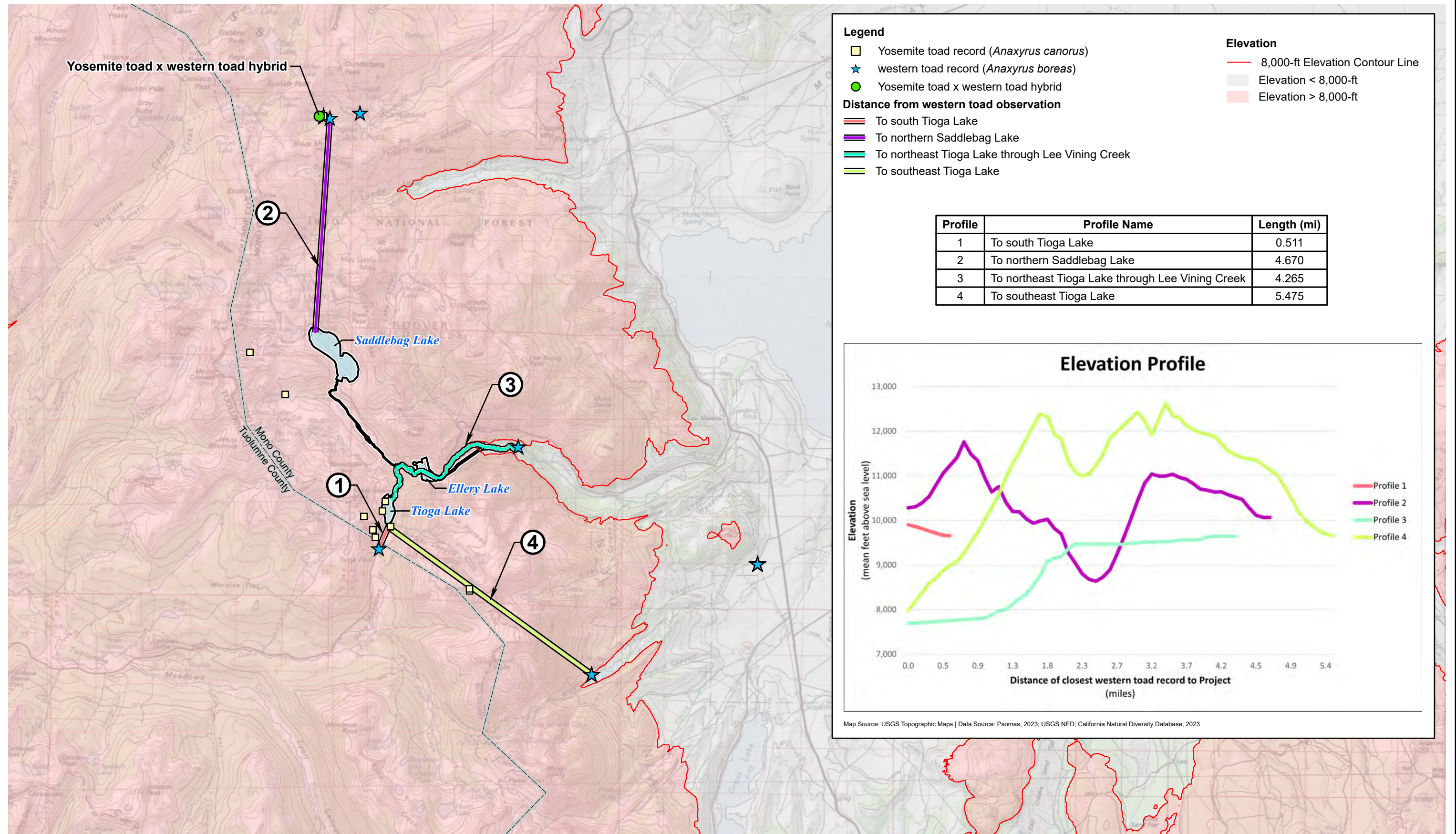


Exhibit 11

Yosemite Toad Upland Dispersal Potential

LEE VINING
HYDROELECTRIC PROJECT
FERC PROJECT NO. 1388

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Historic Regional Yosemite Toad and Western Toad Locations

Lee Vining Hydroelectric Relicensing Project

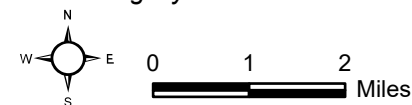
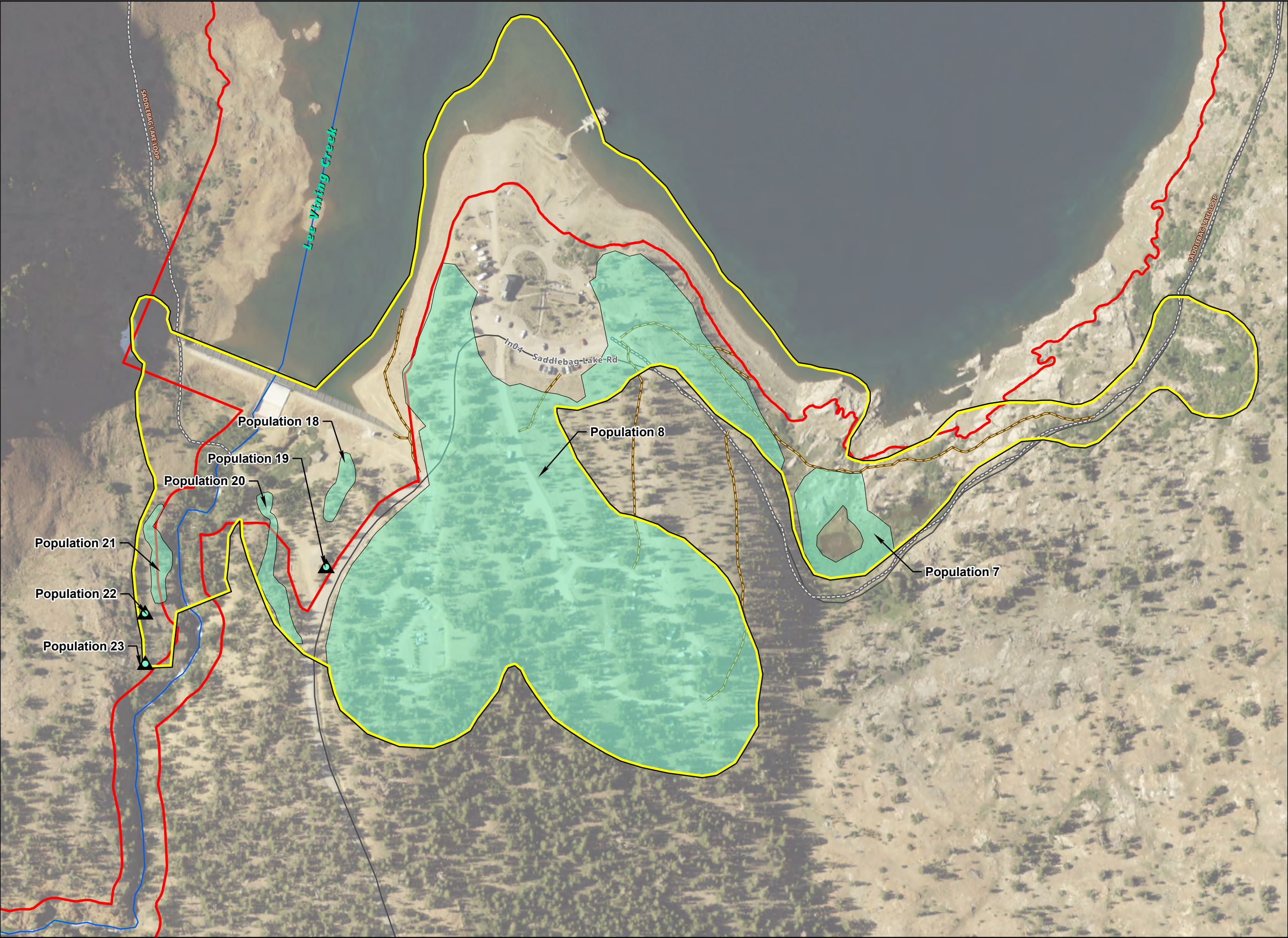


Exhibit 12





- Study Area
- FERC Project Boundary (P-1388)
- Road
- Inyo NF Trail
- Trails
- whitebark pine (*Pinus albicaulis*)
- whitebark pine (*Pinus albicaulis*) individual

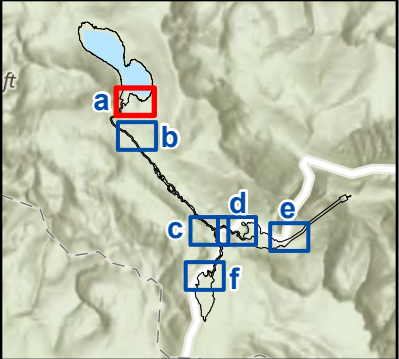
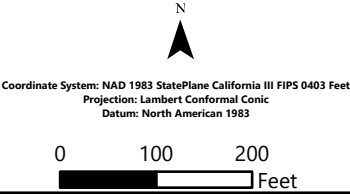
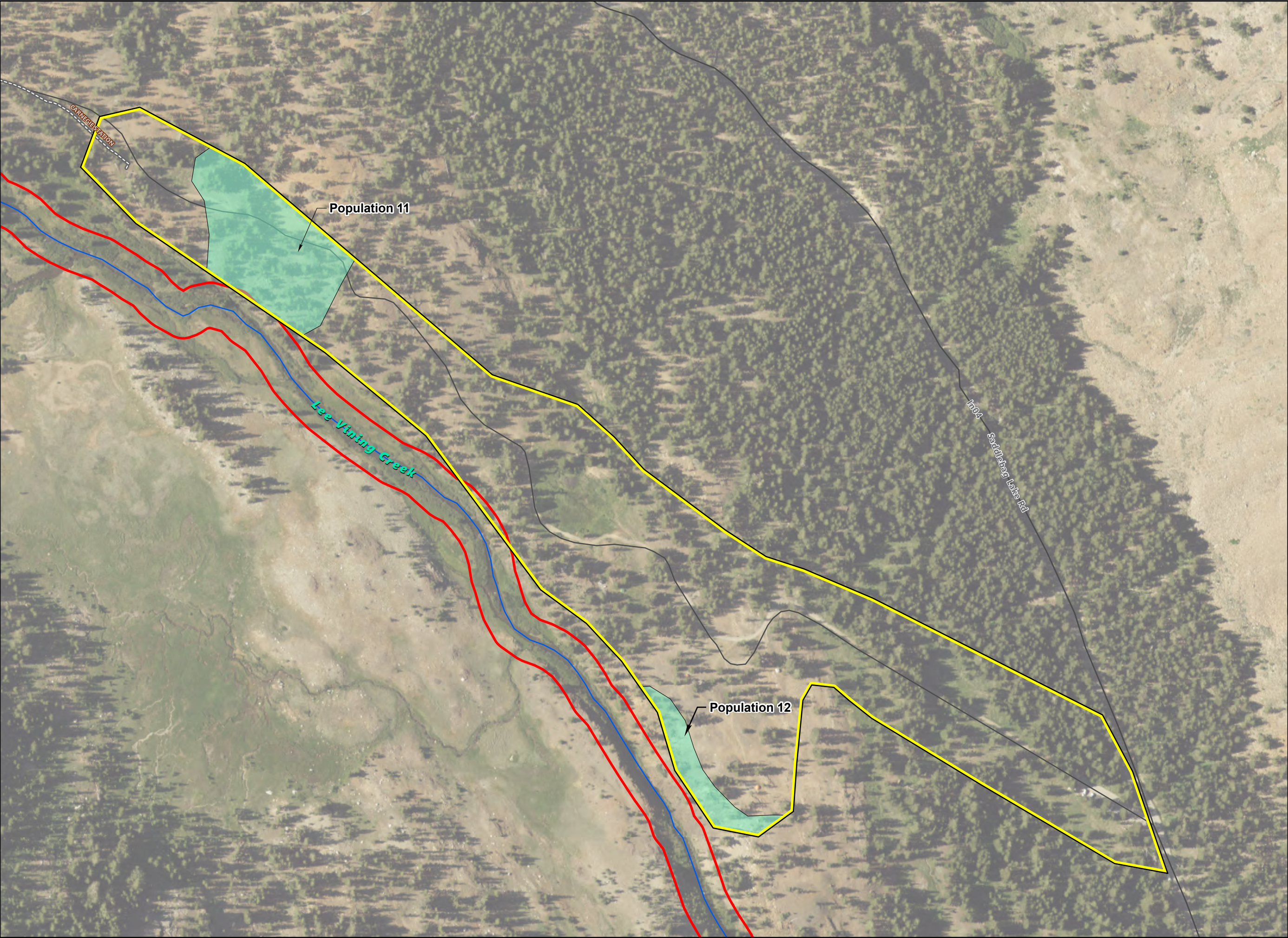


Exhibit 14a
Whitebark Pine
Population Locations

LEE VINING
HYDROELECTRIC PROJECT
FERC PROJECT NO. 1388





-  Study Area
-  FERC Project Boundary (P-1388)
-  Road
-  Inyo NF Trail
-  whitebark pine (*Pinus albicaulis*)

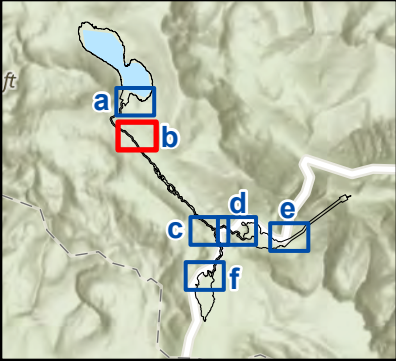
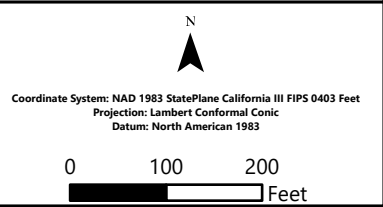
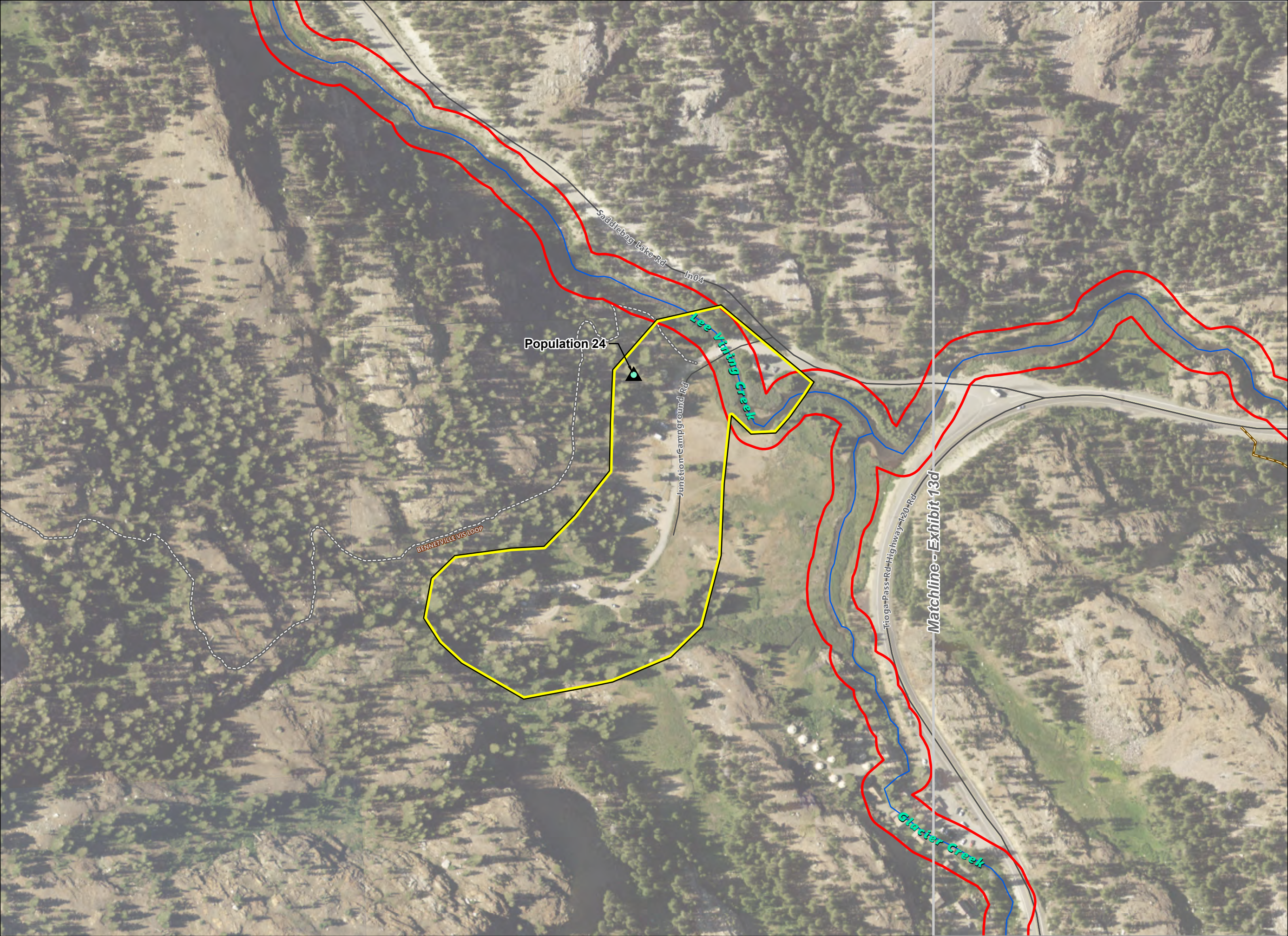


Exhibit 14b
Whitebark Pine
Population Locations

LEE VINING
HYDROELECTRIC PROJECT
FERC PROJECT NO. 1388





-  Study Area
-  FERC Project Boundary (P-1388)
-  Road
-  Inyo NF Trail
-  Trails
-  whitebark pine (*Pinus albicaulis*) individual

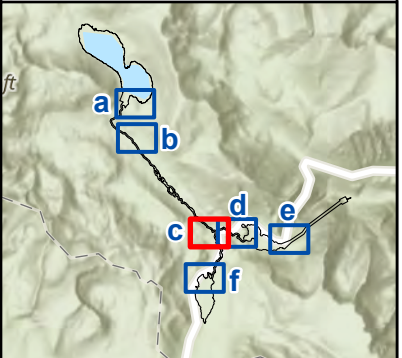
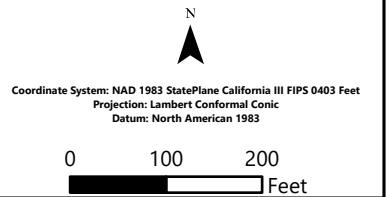
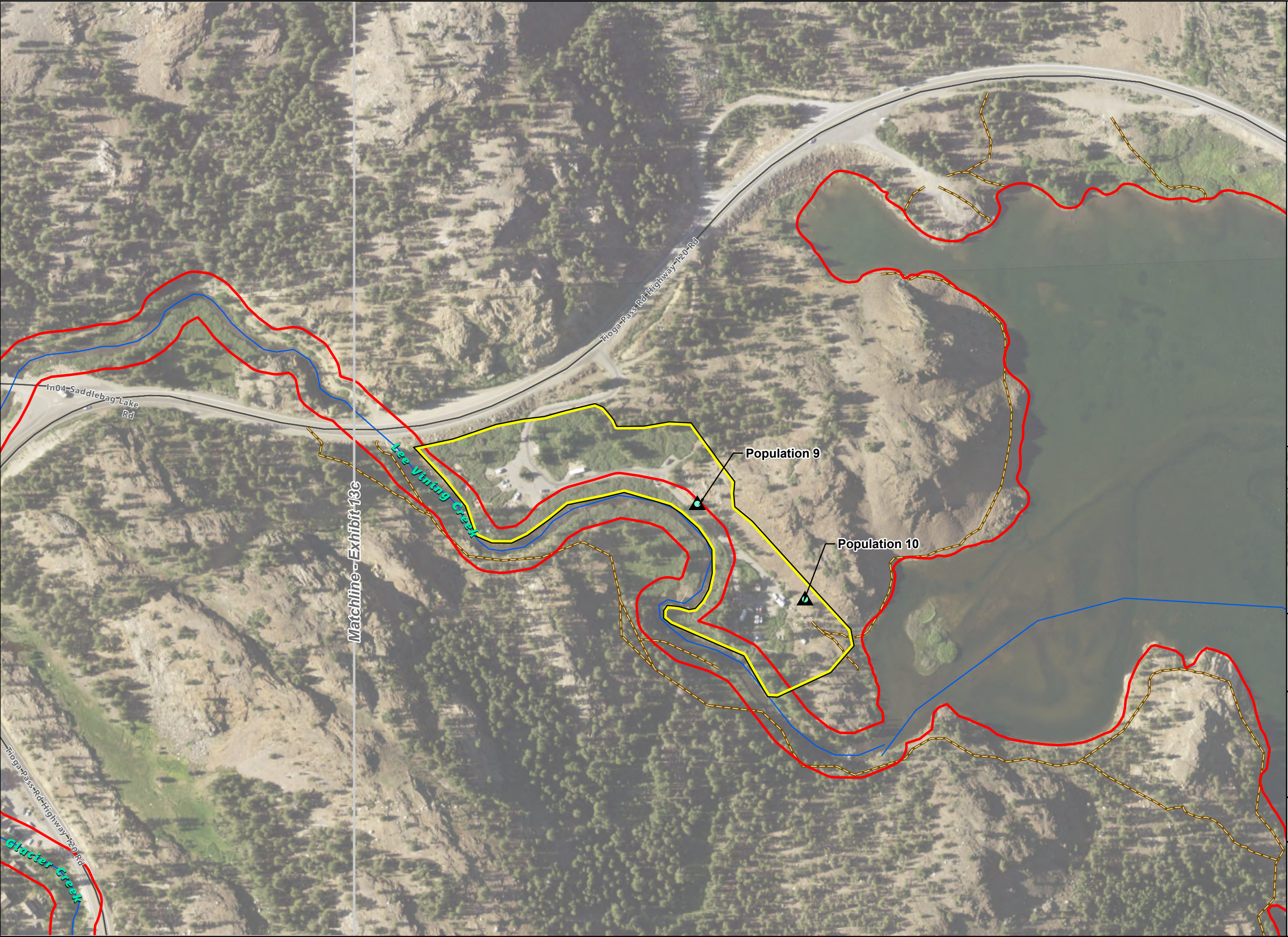


Exhibit 14c Whitebark Pine Population Locations

LEE VINING
HYDROELECTRIC PROJECT
FERC PROJECT NO. 1388





Study Area

FERC Project Boundary (P-1388)

Road

Trails

whitebark pine (*Pinus albicaulis*) individual

Exhibit 14d
Whitebark Pine
Population Locations

LEE VINING
HYDROELECTRIC PROJECT
FERC PROJECT NO. 1388

N

Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet

Projection: Lambert Conformal Conic

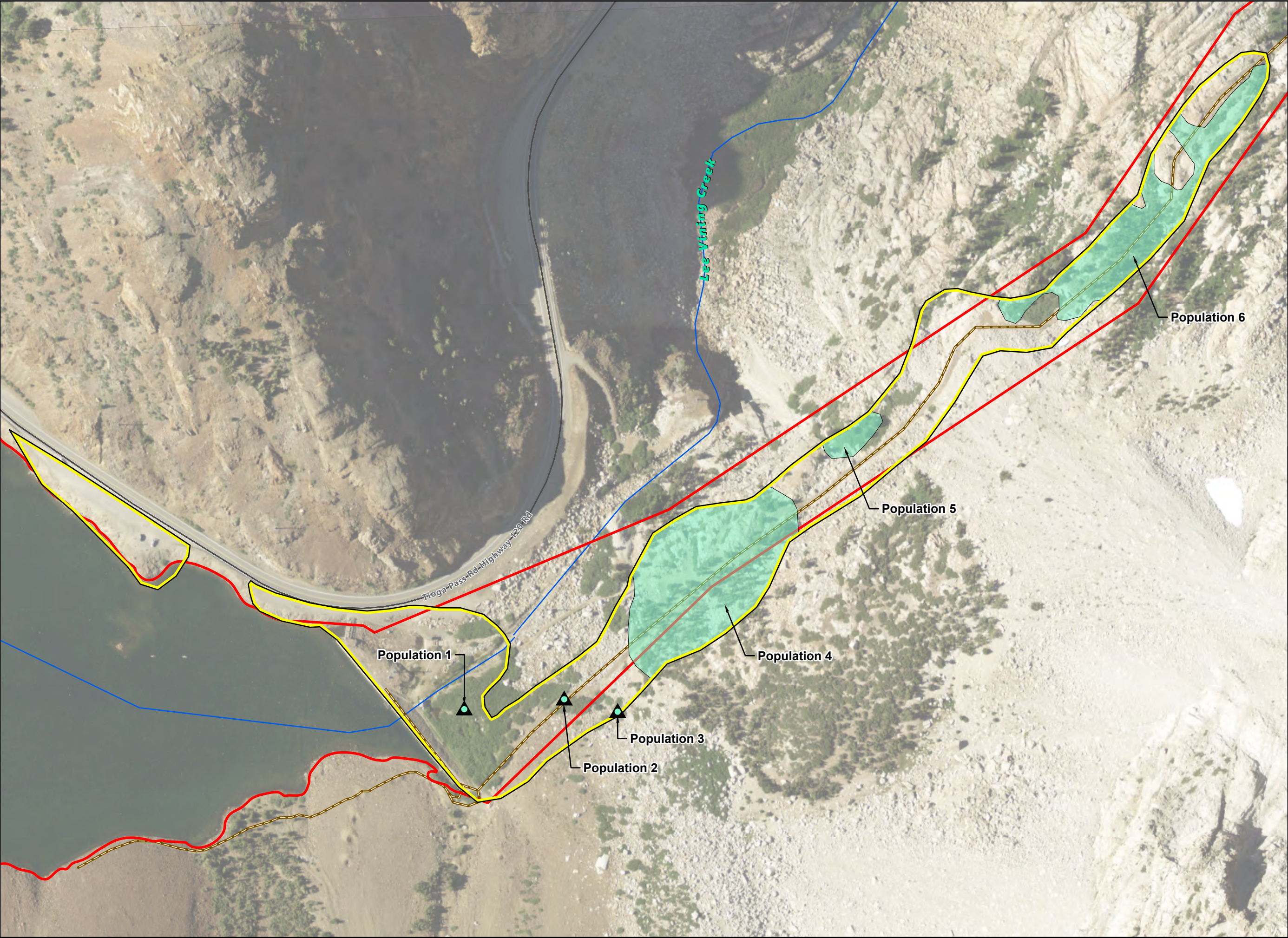
Datum: North American 1983

0

100

200

Feet



- Study Area
- FERC Project Boundary (P-1388)
- Road
- Trails
- whitebark pine (*Pinus albicaulis*)
- whitebark pine (*Pinus albicaulis*) individual

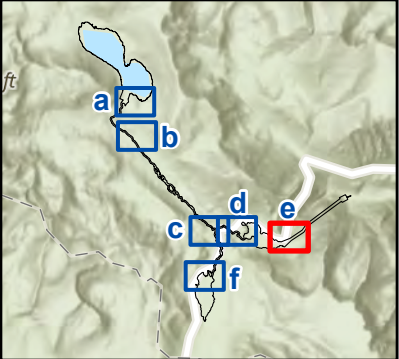
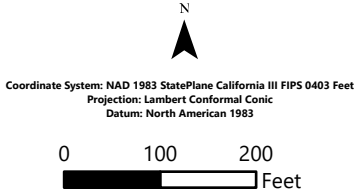
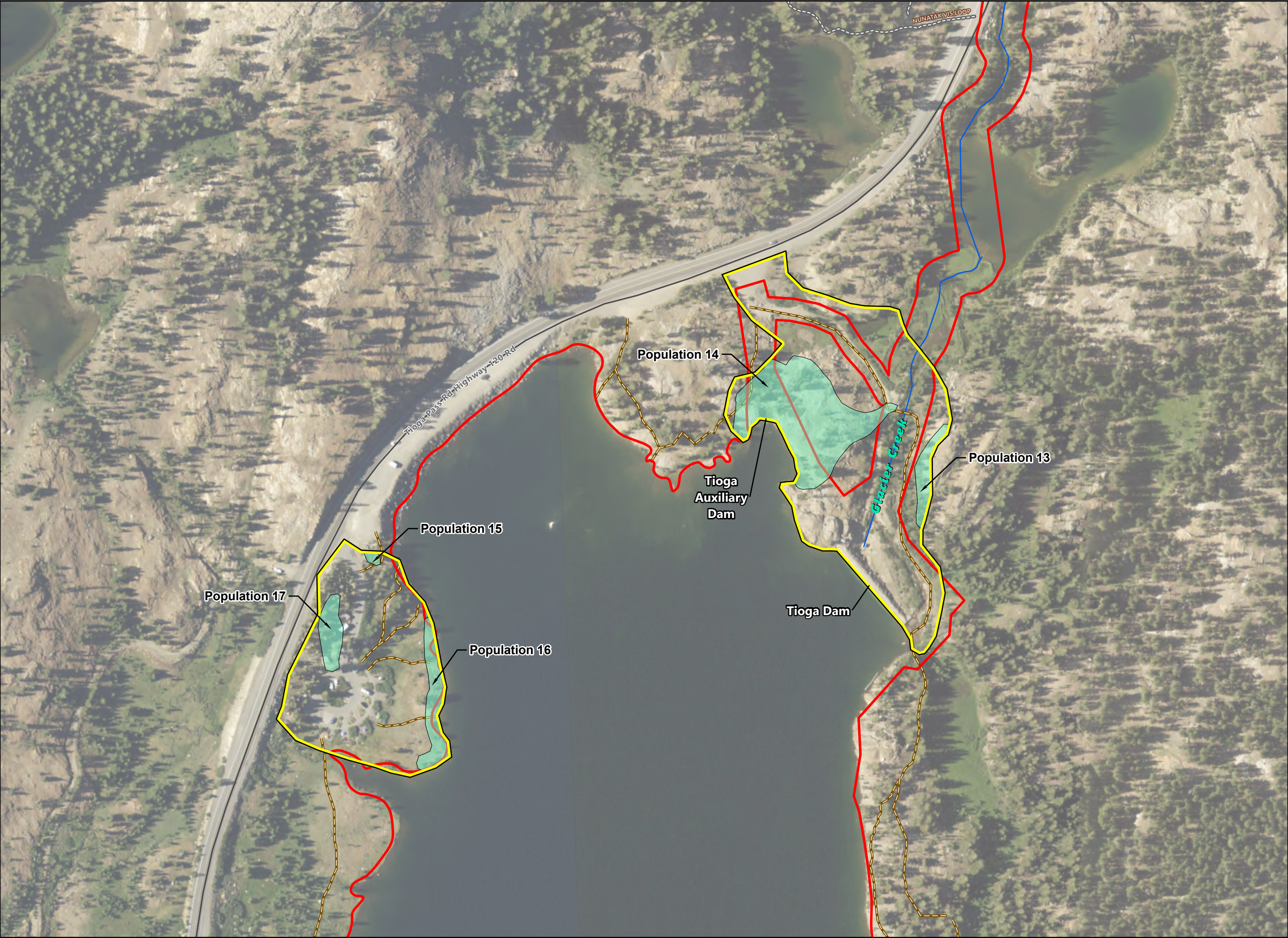


Exhibit 14e
Whitebark Pine
Population Locations

LEE VINING
HYDROELECTRIC PROJECT
FERC PROJECT NO. 1388





- Study Area
- FERC Project Boundary (P-1388)
- Road
- Inyo NF Trail
- Trails
- whitebark pine (*Pinus albicaulis*)

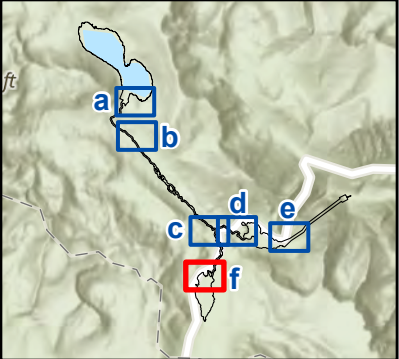
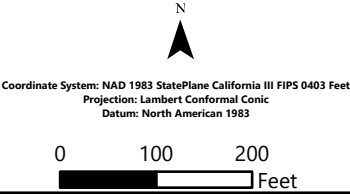
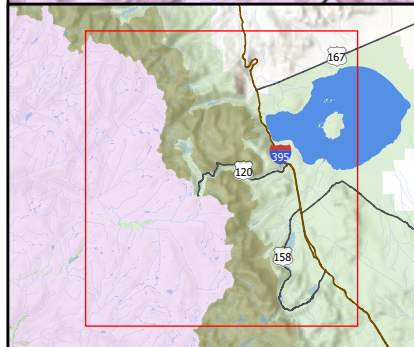
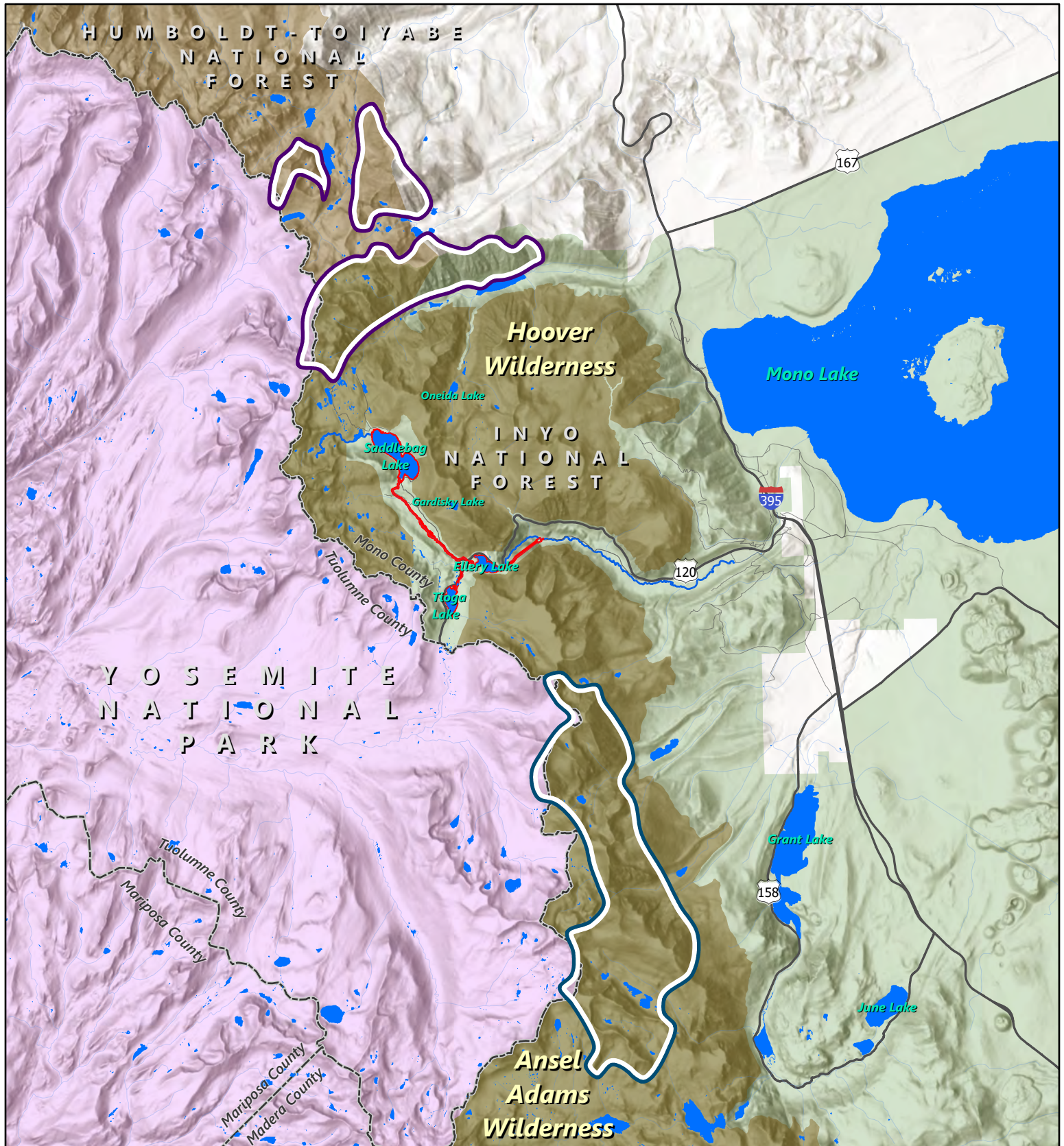


Exhibit 14f
Whitebark Pine
Population Locations

LEE VINING
HYDROELECTRIC PROJECT
FERC PROJECT NO. 1388



Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983



- FERC Project Boundary (P-1388)
- Taboose Ewe Spring Habitat
- Warren Ewe Spring Habitat
- Inyo National Forest
- Wilderness Area (Inyo NF)
- Yosemite National Park



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Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet
 Projection: Lambert Conformal Conic
 Datum: North American 1983

0 1.5 3

 Miles

Exhibit 15 Sierra Nevada Bighorn Sheep Herd Areas

**LEE VINING
HYDROELECTRIC PROJECT
FERC PROJECT NO. 1388**

ATTACHMENT 1

TERR-2 General Wildlife Technical Report

SOUTHERN CALIFORNIA EDISON Lee Vining Hydroelectric Project (FERC Project No. 1388)



GENERAL WILDLIFE RESOURCES SURVEY (TERR-2) FINAL TECHNICAL REPORT



SEPTEMBER 2024

SOUTHERN CALIFORNIA EDISON

**Lee Vining Hydroelectric Project
(FERC Project No. 1388)**

GENERAL WILDLIFE RESOURCES SURVEY (TERR-2) FINAL TECHNICAL REPORT

Southern California Edison
2244 Walnut Grove Avenue
Rosemead, CA 91770

September 2024

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LIST OF ACRONYMS AND ABBREVIATIONS

amsl	above mean sea level
CDFW	California Department
ESA	Endangered Species Act
FERC	Federal Energy Regulatory Commission
GPS	global positioning system
LADWP	Los Angeles Department of Water and Power
NOI	Notice of Intent
NPS	National Park Service

O&M	operation and maintenance
PAD	Pre-Application Document
Project	Lee Vining Hydroelectric Project (FERC Project No. 1388)
SCE	Southern California Edison
TWG	Technical Working Group
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife

1.0 INTRODUCTION

This Technical Report transmits findings of literature research and field studies specific to terrestrial wildlife in association with the *General Wildlife Resources Survey (TERR-2) Technical Study Plan* (Study Plan) in support of Southern California Edison (SCE) Company's Lee Vining Hydroelectric Project (Project) relicensing effort, Federal Energy Regulatory Commission (FERC) Project Number 1388. The Final Technical Study Plan was filed with FERC in April 2022 (SCE, 2022).

This Technical Report incorporates the data collected during 2023 field surveys and the findings from *General Wildlife Resources Survey (TERR-2) Technical Memorandum* (including 2022 field surveys) submitted in January 2023, with the exception that survey data and results associated with the Yosemite toad (*Anaxyrus canorus*) have been compiled into a separate technical report (Yosemite Toad Technical Report, which is included as Appendix A) and are subsequently not included in this report.

1.1. PROJECT DESCRIPTION AND LOCATION

The SCE Company is the licensee, owner, and operator of the Project. The Project is located 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 1.1-1). The 11.25-megawatt Project is situated on Lee Vining Creek, largely within the Inyo National Forest managed by the U.S. Forest Service (USFS); the remaining Project lands are privately owned.

The Project consists of three dams and reservoirs, an auxiliary dam, a flowline consisting of a pipeline and penstock, and a powerhouse. These features and facilities all occur within a defined boundary, hereafter referred to as the FERC Project Boundary. 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 (O&M) of the Project.

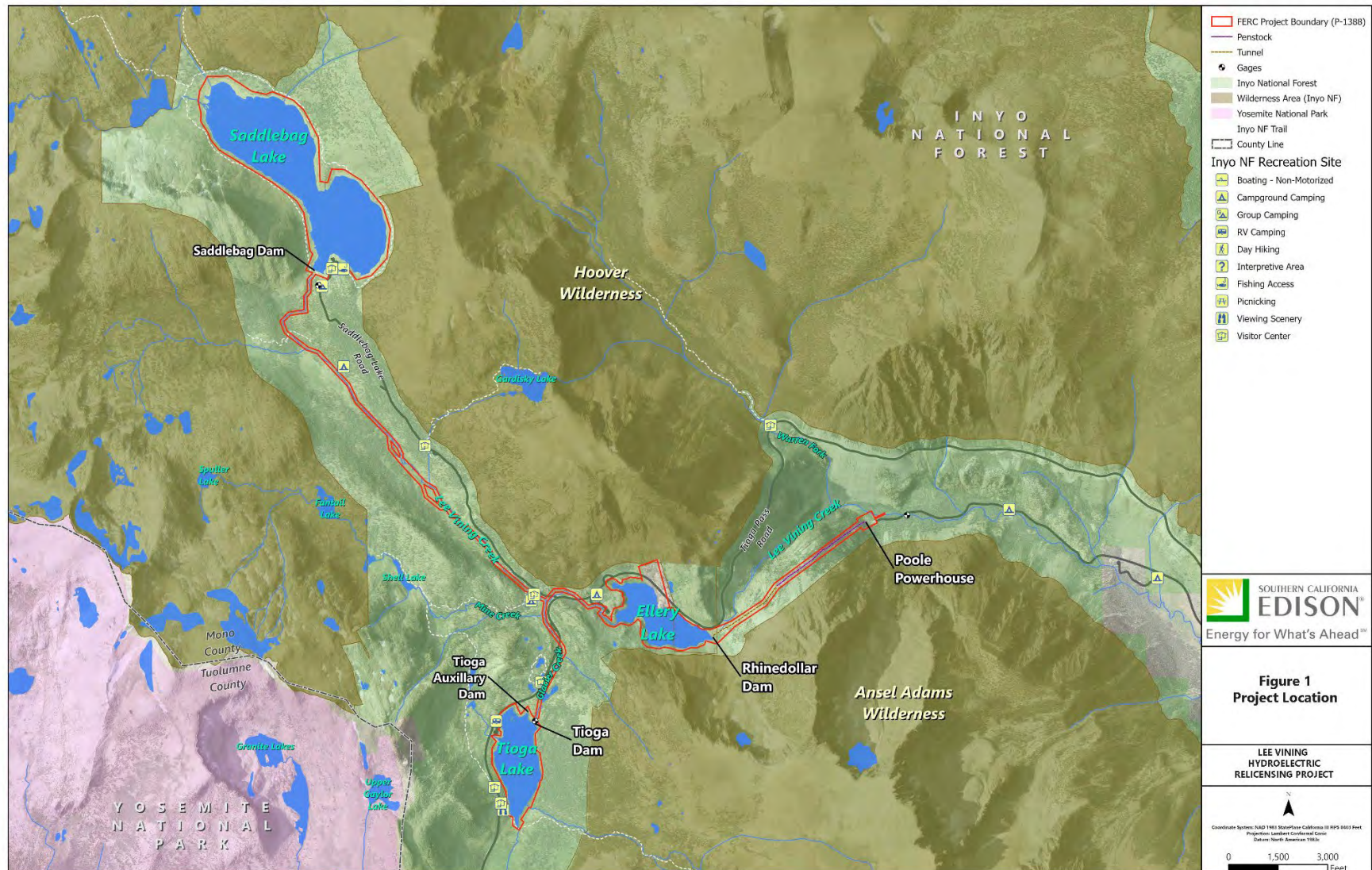


Figure 1.1-1. Project Location.

1.2. PURPOSE AND NEED

The purpose of this study is to provide supplemental information on the occurrence and distribution of the common and special-status terrestrial wildlife species. The data in this study are needed by SCE, FERC, federal and state resource agencies, and interested Stakeholders to appropriately understand the existing conditions on-site and to determine the potential for Project O&M activities to affect local populations of special-status wildlife species, if present.

2.0 STUDY GOALS AND OBJECTIVES

The study objectives are:

- Build a compendium of common, U.S. Forest Service At-Risk Species and Species of Conservation Concern (USFS, 2019), and other special-status wildlife species occurring within the Project areas that may be affected by routine O&M activities.
- Identify rare, threatened, and endangered riparian birds in the area during general wildlife surveys.
- Assess willow flycatcher (*Empidonax traillii*) nesting habitat downstream of the FERC Project Boundary between Poole Powerhouse and the reservoir at the Los Angeles Department of Water and Power (LADWP) Diversion Dam, using vegetation classification as the primary tool as well as aerial photography review and ground-truthing.

2.1. EXISTING CONDITIONS

2.1.1. TOPOGRAPHY

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 above mean sea level (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).

The three Project reservoirs include Saddlebag Lake, Tioga Lake, and Ellery Lake. 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 (FERC, 1992). Tioga Lake lies in a valley on glacial till with a scattering of rounded rock outcrops (FERC, 1992). Ellery Lake has a rocky shoreline with several areas of talus slopes entering the lake from the steep terrain along the southern margin.

Lee Vining Creek drains the eastern Sierra Nevada crest and Glacier Creek is a tributary 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).

2.1.2. CLIMATE

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 24.5 inches (CDEC, 2021). 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 degrees Fahrenheit (°F) and 34°F at Dana Meadows (CDEC, 2021).

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, 2020).

2.1.3. VEGETATION TYPES

Thirteen vegetation communities and other areas were identified in 2022 in the Botanical Resources Study Area associated with the Project: 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 (Psomas, 2024).

3.0 STUDY AREA

The Wildlife Study Area is shown on Figure 3-1. It is composed of the following SCE O&M areas, including a 200-foot buffer:

- 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

The Willow Flycatcher Study Area consists of the portion of Lee Vining Creek that is downstream of Poole Powerhouse to the reservoir at the LADWP Diversion Dam (Figure 3-1).

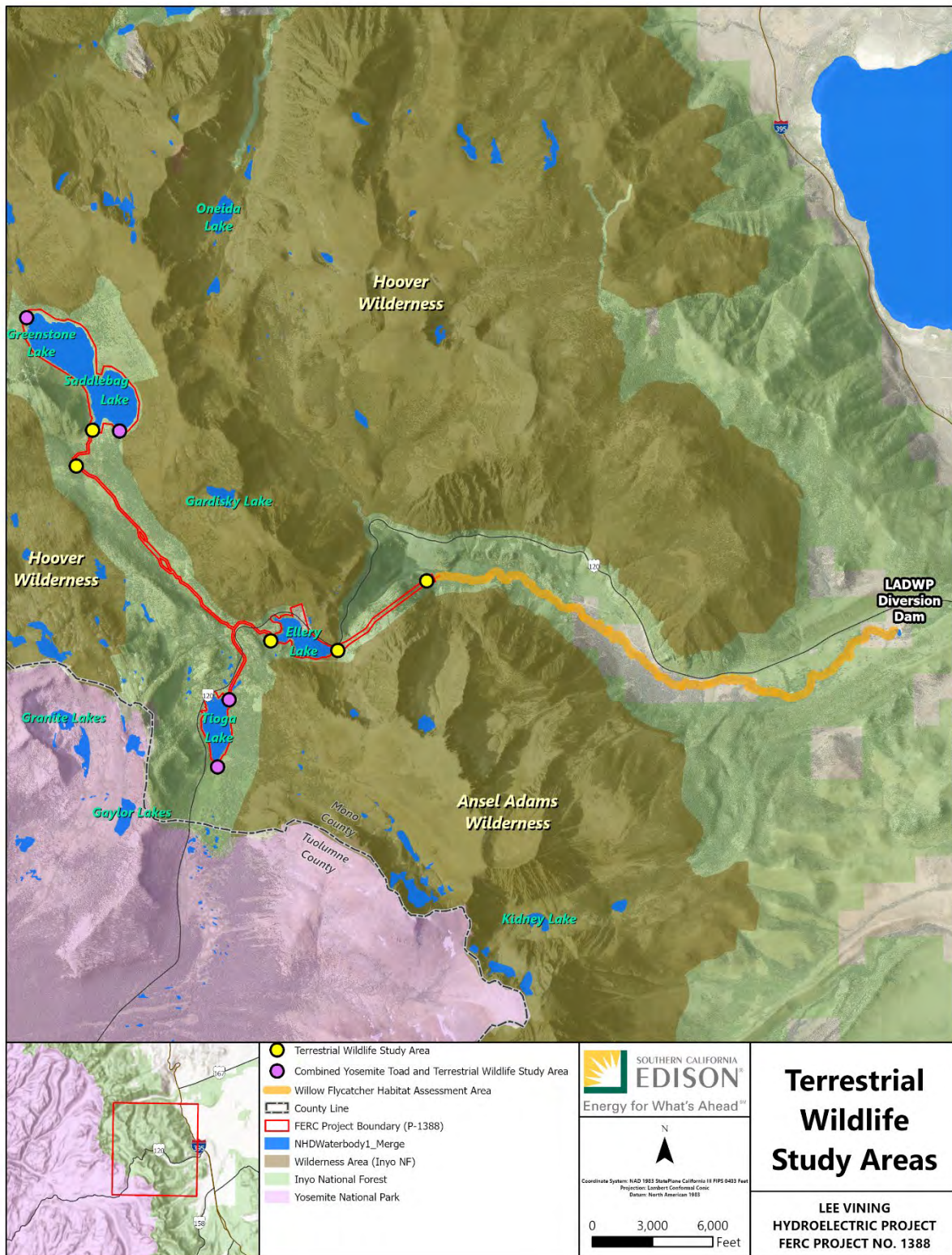


Figure 3-1. Terrestrial Wildlife Study Areas.

4.0 METHODS

The Study Plan details the proposed study area, methods, and schedule to meet the study objectives identified for terrestrial wildlife. As a result of the observations made during the initial field work, the field data collected was modified and expanded; the revised methods implemented are described below.

4.1. STUDY PLAN MODIFICATIONS

The Study Plan identified 1 year of surveys; however, surveys were performed across 3 years: 2021 (1 survey day), 2022 (11 survey days), and 2023 (20 survey days). The additional surveys were primarily scheduled to document any potential, previously unknown breeding locations for the Yosemite toad. The 2022 field season had lower than average snowfall.¹ This lack of normal snowfall caused potential breeding ponds to dry out early in the season. The 2023 field season was performed to observe breeding in those ponds and other identified potential breeding areas because 2023 was an above-average precipitation year. Although the Study Plan was modified to provide more intensive study of the life history of the Yosemite toad, the additional years of field surveys allowed for more comprehensive observations of other wildlife species within and around the FERC Project Boundary.

Separately, the timing of the trail camera deployment was also modified from what was described in the Study Plan. The trail cameras were proposed to be deployed through the entire calendar year; however, deployments were subsequently limited to months where the cameras would not be buried in snow (i.e., the cameras were removed for the winter months).

4.2. GENERAL WILDLIFE PEDESTRIAN SURVEYS

Multiple terrestrial survey visits were performed by biologists; Table 4.2-1 shows the survey dates and associated biologists performing the survey. For consistency in data collection, surveys were conducted by the same four qualified biologists: Steve Norton, Jason Berkley, Jonathan Aguayo, and Sarah Berryman. To further standardize data collection, field surveys were scheduled so the biologists were rotated and paired with the previous week's surveyor.

Table 4.2-1. Survey Dates and Surveying Biologist

Survey Year	Survey Date	Surveying Biologists
2021	September 28	Steve Norton, Brad Blood
2022	June 1–2	Steve Norton, Jonathan Aguayo
	June 15–16	Steve Norton, Jason Berkley

¹ The average snow depth in Tioga Pass during the April measurements (between 1939 and 2023) is 68 inches. The same measurement in April of 2022 was 13.5 inches (50 percent of average) and in April of 2023 was 64.5 inches (211 percent of average) (NRCS, 2023).

Survey Year	Survey Date	Surveying Biologists
2023	July 26–27	Steve Norton, Jonathan Aguayo
	August 9–11	Jason Berkley
	August 23–24	Steve Norton, Jason Berkley
	July 6–7	Steve Norton, Sarah Berryman
	July 13–14	Steve Norton, Sarah Berryman
	July 21–22	Jason Berkley, Sarah Berryman
	July 27–28	Jason Berkley
	August 1–2	Jason Berkley, Jonathan Aguayo
	August 9–11	Steve Norton, Sarah Berryman
	August 23	Steve Norton
	September 20–21	Jason Berkley
	October 10–11	Steve Norton
	October 31–November 1	Jason Berkley

Although each survey visit was performed with the purpose of documenting specific target wildlife species (such as visual encounter surveys for Yosemite toad), all non-target wildlife species (or evidence of the species) observed during each survey visit were recorded in field notes or onto electronic tablet devices. Regardless of the survey purpose, each survey visit included pedestrian surveys which included the following:

- Identifying wildlife species visually (viewing characteristic markings, behaviors, or diagnostic sign [such as scat, footprints, burrows, etc.]) with and without binoculars and aurally (listening to diagnostic vocalizations);
- Lifting, overturning, and carefully replacing objects such as rocks, boards, and debris; and
- Documenting any active or abandoned raptor nests using a global positioning system (GPS)-enabled device.

Prior to the survey visits, a review of previously observed wildlife occurrences and aerial photographs of the study area was conducted to focus survey efforts. Care was taken to not trample sensitive habitat, such as wet meadow areas potentially supporting Yosemite toad subadults and adults.

4.3. TRAIL CAMERA SURVEYS

Trail cameras were installed at three locations within the study area (Appendix B). Locations were generally sited to capture resident wildlife species, specifically in natural clearings of naturally vegetated areas. The first camera location was approximately 300 feet east of Tioga Lake at the top of a wet meadow near the northeastern shore. The

second camera location was along the western side of the Lee Vining Creek floodplain approximately 8,000 feet downstream of Saddlebag Lake. The third camera location was within the meadow area connecting Greenstone Lake and Saddlebag Lake. Cameras were deployed at the first and second locations between June 16 and August 24, 2022. A camera was deployed again at the first location between July 7 and September 21, 2023. Finally, a camera was deployed at the third location between July 28 and September 21, 2023. Memory card status and battery life was checked and maintained during each field visit. Representative photographs collected by the trail cameras are included in Appendix B.

4.4. BAT OCCUPANCY SURVEYS

All the structures within the study area were inspected for sign of bat roosting on September 28, 2021, and again on August 9, 2023. Signs of roosting include audible social calls; observation of individuals roosting; and presence of guano, urine staining, or insect prey remains. Additionally, two ultrasonic acoustic microphones and recording units were deployed to catalog the bat species foraging in the study area (Appendix B). One unit was deployed along Lee Vining Creek approximately 120 feet downstream of Saddlebag Dam and the second unit was deployed along Lee Vining Creek below the tail race at Poole Powerhouse.

Anabat Swift units manufactured by Titley Scientific were used for acoustic recording. These units were deployed from August 9 through August 11, 2023, and the recording extended from approximately sunset overnight until approximately 30 minutes before sunrise. All data were recorded in full spectrum format with varying settings to filter and minimize background noise recorded during the survey (e.g., high-frequency insect calls, wind noise) to aid in bat echolocation identification.

The data collected were processed and analyzed with SonoBat 4.4.5, a bat species identification software, using the California classifier. This version of SonoBat automatically associates bat echolocation call patterns to the likely bat species. The software cannot definitively identify the bat species making the call; therefore, Senior Bat Biologist Steve Norton further analyzed the recordings to verify the accuracy of species-level identifications. The subsequent review referenced patterns with internal call libraries and various call parameter keys, such as the *Echolocation Call Characteristics of California Bats* by Humboldt State University Bat Laboratory. The sonogram of each recording was visually inspected for echoes, noise, and other distortions that could lead to misidentification. All auto-generated identifications that were not diagnostic of a species or a unique group of species were rejected and the erroneous results were not reported.

4.5. WILLOW FLYCATCHER HABITAT ASSESSMENT

The portion of Lee Vining Creek downstream of Poole Powerhouse and upstream of the reservoir at the LADWP Diversion Dam (Willow Flycatcher Study Area) was assessed for the presence of potentially suitable nesting habitat for the willow flycatcher and relevant subspecies (i.e., southwestern willow flycatcher [*E. t. extimus*]). Aerial photography was first reviewed for potential habitat areas followed by an in-person visual assessment of

the potential habitat on June 2, 2022. Habitat was assessed using habitat parameters described in U.S. Geological Survey Techniques and Methods 2A-10 (Sogge et al., 2010).

5.0 RESULTS

5.1. GENERAL WILDLIFE

The wildlife observed or otherwise documented during the 2022 and 2023 surveys are listed in Table 5.1-1.

Table 5.1-1. Wildlife Compendium

Scientific Name	Common Name	Status ^a	Saddlebag Lake	Tioga Lake	Ellery Lake	Study Area between Reservoirs	Poole Powerhouse
AMPHIBIANS							
BUFONIDAE—TRUE TOAD FAMILY							
<i>Anaxyrus canorus</i>	Yosemite toad	FT, SSC	X	X			
<i>Anaxyrus</i> sp.	unknown toad					X	
HYLIDAE—TREEFROG FAMILY							
<i>Pseudacris sierra</i>	Sierran treefrog		X	X		X	
SNAKES							
NATRICIDAE—HARMLESS LIVE-BEARING SNAKE FAMILY							
<i>Thamnophis elegans elegans</i>	mountain gartersnake					X	
BIRDS							
ANATIDAE—SWAN, GOOSE, AND DUCK FAMILY							
<i>Anas platyrhynchos</i>	mallard		X			X	
<i>Mergus merganser</i>	common merganser		X		X		
PHASIANIDAE—PARTRIDGE AND TURKEY FAMILY							
<i>Dendragapus fuliginosus</i>	sooty grouse		X				
TROCHILIDAE—HUMMINGBIRD FAMILY							
<i>Selasphorus calliope</i>	calliope hummingbird		X				
SCOLOPACIDAE—SANDPIPER FAMILY							
<i>Actitis macularius</i>	spotted sandpiper			X			
PANDIONIDAE—OSPREY FAMILY							
<i>Pandion haliaetus</i>	osprey			X			

Scientific Name	Common Name	Status ^a	Saddlebag Lake	Tioga Lake	Ellery Lake	Study Area between Reservoirs	Poole Powerhouse
ACCIPITRIDAE—HAWK FAMILY							
<i>Haliaeetus leucocephalus</i>	bald eagle	SE, FP	X	X			
<i>Buteo jamaicensis</i>	red-tailed hawk					X	
<i>Aquila chrysaetos</i>	golden eagle	FP	X				
PICIDAE—WOODPECKER FAMILY							
<i>Sphyrapicus thyroideus</i>	Williamson's sapsucker			X			
<i>Picoides arcticus</i>	black-backed woodpecker			X			
<i>Colaptes auratus</i>	northern flicker		X	X	X	X	X
FALCONIDAE—FALCON FAMILY							
<i>Falco peregrinus</i>	peregrine falcon	FP	X				
<i>Falco mexicanus</i>	prairie falcon		X				
TYRANNIDAE—TYRANT FLYCATCHER FAMILY							
<i>Contopus cooperi</i>	olive-sided flycatcher	SSC		X			
<i>Empidonax oberholseri</i>	dusky flycatcher			X		X	
CORVIDAE—JAY AND CROW FAMILY							
<i>Cyanocitta stelleri</i>	Steller's jay		X	X		X	X
<i>Nucifraga columbiana</i>	Clark's nutcracker		X	X			X
<i>Corvus corax</i>	common raven		X	X			X
PARIDAE—TITMOUSE FAMILY							
<i>Poecile gambeli</i>	mountain chickadee		X	X	X	X	X
SITTIDAE—NUTHATCH FAMILY							
<i>Sitta canadensis</i>	red-breasted nuthatch		X	X			

Scientific Name	Common Name	Status ^a	Saddlebag Lake	Tioga Lake	Ellery Lake	Study Area between Reservoirs	Poole Powerhouse
<i>Sitta carolinensis</i>	white-breasted nuthatch			X		X	X
CERTHIIDAE—CREEPER FAMILY							
<i>Certhia americana</i>	brown creeper		X	X			X
TROGLODYTIDAE—WREN FAMILY							
<i>Salpinctes obsoletus</i>	rock wren		X				
REGULIDAE—KINGLET FAMILY							
<i>Regulus satrapa</i>	golden-crowned kinglet		X	X			
<i>Regulus calendula</i>	ruby-crowned kinglet					X	X
TURDIDAE—THRUSH FAMILY							
<i>Sialia currucoides</i>	mountain bluebird			X		X	X
<i>Catharus guttatus</i>	hermit thrush			X		X	
<i>Turdus migratorius</i>	American robin		X	X	X		X
FRINGILLIDAE—FINCH FAMILY							
<i>Haemorhous purpureus</i>	purple finch		X				
<i>Haemorhous cassinii</i>	Cassin's finch		X	X			
<i>Spinus pinus</i>	pine siskin			X		X	
PASSERELLIDAE—NEW WORLD SPARROW FAMILY							
<i>Passerella iliaca</i>	fox sparrow					X	
<i>Junco hyemalis</i>	dark-eyed junco		X	X	X	X	X
<i>Zonotrichia leucophrys</i>	white-crowned sparrow		X	X		X	X
<i>Melospiza melodia</i>	song sparrow		X	X	X	X	X
<i>Melospiza lincolnii</i>	Lincoln's sparrow					X	

Scientific Name	Common Name	Status ^a	Saddlebag Lake	Tioga Lake	Ellery Lake	Study Area between Reservoirs	Poole Powerhouse
<i>Pipilo chlorurus</i>	green-tailed towhee		X	X		X	
ICTERIDAE—BLACKBIRDS AND ORIOLES							
<i>Euphagus cyanocephalus</i>	Brewer's blackbird					X	
PARULIDAE—WOOD-WARBLE FAMILY							
<i>Leiothlypis celata</i>	orange-crowned warbler					X	
<i>Geothlypis tolmiei</i>	MacGillivray's warbler					X	
<i>Setophaga coronata</i>	yellow-rumped warbler			X	X	X	X
<i>Cardellina pusilla</i>	Wilson's warbler					X	
MAMMALS							
SCIURIDAE—SQUIRREL FAMILY							
<i>Tamiasciurus douglasii</i>	Douglas' squirrel		X	X			
<i>Marmota flaviventris</i>	yellow-bellied marmot		X	X			
<i>Callospermophilus lateralis</i>	golden-mantled ground squirrel			X	X		
<i>Urocitellus beldingi</i>	Belding's ground squirrel		X				
<i>Neotamias alpinus</i>	alpine chipmunk		X				
<i>Neotamias minimus</i>	least chipmunk		X	X	X	X	
<i>Thomomys bottae</i>	Botta's pocket gopher			X		X	
OCHOTONIDAE—PIKAS							
<i>Ochotona princeps</i>	American pika		X	X			
LEPORIDAE—HARE AND RABBIT FAMILY							
<i>Lepus americanus tahoensis</i>	snowshoe hare	SSC				X	

Scientific Name	Common Name	Status ^a	Saddlebag Lake	Tioga Lake	Ellery Lake	Study Area between Reservoirs	Poole Powerhouse
<i>Lepus townsendii townsendii</i>	white-tailed jackrabbit	SSC				X	
MOLOSSIDAE—MOLOSSID BAT FAMILY							
<i>Tadarida brasiliensis</i> ^c	Mexican free-tailed bat		X				
VESPERTILIONIDAE—VESPERTILIONID BAT FAMILY							
<i>Lasiurus frantzii</i>	western red bat						X
<i>Aeorestes cinereus</i>	hoary bat						X
<i>Lasionycteris noctivagans</i>	silver-haired bat						X
<i>Myotis ciliolabrum</i>	small-footed bat						X
<i>Myotis evotis</i>	long-eared bat		X				X
<i>Myotis lucifugus</i>	little brown bat		X				X
<i>Myotis volans</i>	long-legged bat						X
<i>Myotis yumanensis</i>	Yuma bat						X
FELIDAE—CAT FAMILY							
<i>Puma concolor</i>	mountain lion			X			
CANIDAE—DOG FAMILY							
<i>Canis latrans</i>	coyote		X	X		X	
URSIDAE—BEAR FAMILY							
<i>Ursus americanus</i>	black bear		X	X		X	
CERVIDAE—DEER FAMILY							
<i>Odocoileus hemionus</i>	mule deer		X	X	X	X	
BOVIDAE—BOVID FAMILY							

Scientific Name	Common Name	Status ^a	Saddlebag Lake	Tioga Lake	Ellery Lake	Study Area between Reservoirs	Poole Powerhouse
<i>Ovis canadensis nelsoni sierrae</i>	Sierra Nevada bighorn sheep	FE, SE, FP		X		X	

^a Federal (U.S. Fish and Wildlife Service)

FE = Endangered

FT = Threatened

State (California Department of Fish and Wildlife)

SE = Endangered

FP = Fully Protected

SSC = Species of Special Concern

Source: CDFW, 2023

5.2. 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 Appendix B.

5.3. BAT OCCUPANCY

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 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 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 (*Lasiurus frantzii*), hoary bat (*Aeorestes cinereus*), silver-haired bat (*Lasionycteris noctivagans*), small-footed bat (*Myotis ciliolabrum*), long-legged bat (*Myotis volans*), and Yuma bat (*Myotis yumanensis*).

5.4. WILLOW FLYCATCHER

5.4.1. LITERATURE REVIEW

The willow flycatcher (*Empidonax traillii*) is a widespread species that breeds across much of the United States. In California, there are three subspecies of breeding willow flycatchers: southwestern willow flycatcher (*E. t. extimus*), little willow flycatcher (*E. t. brewsteri*), and Great Basin willow flycatcher (*E. t. adastus*). The State of California lists the species as Endangered when nesting; therefore, all three subspecies of the willow flycatcher species that occur in California are protected under the California Endangered Species Act (ESA). The federal government lists only the southwestern willow flycatcher subspecies as Endangered under the federal ESA.

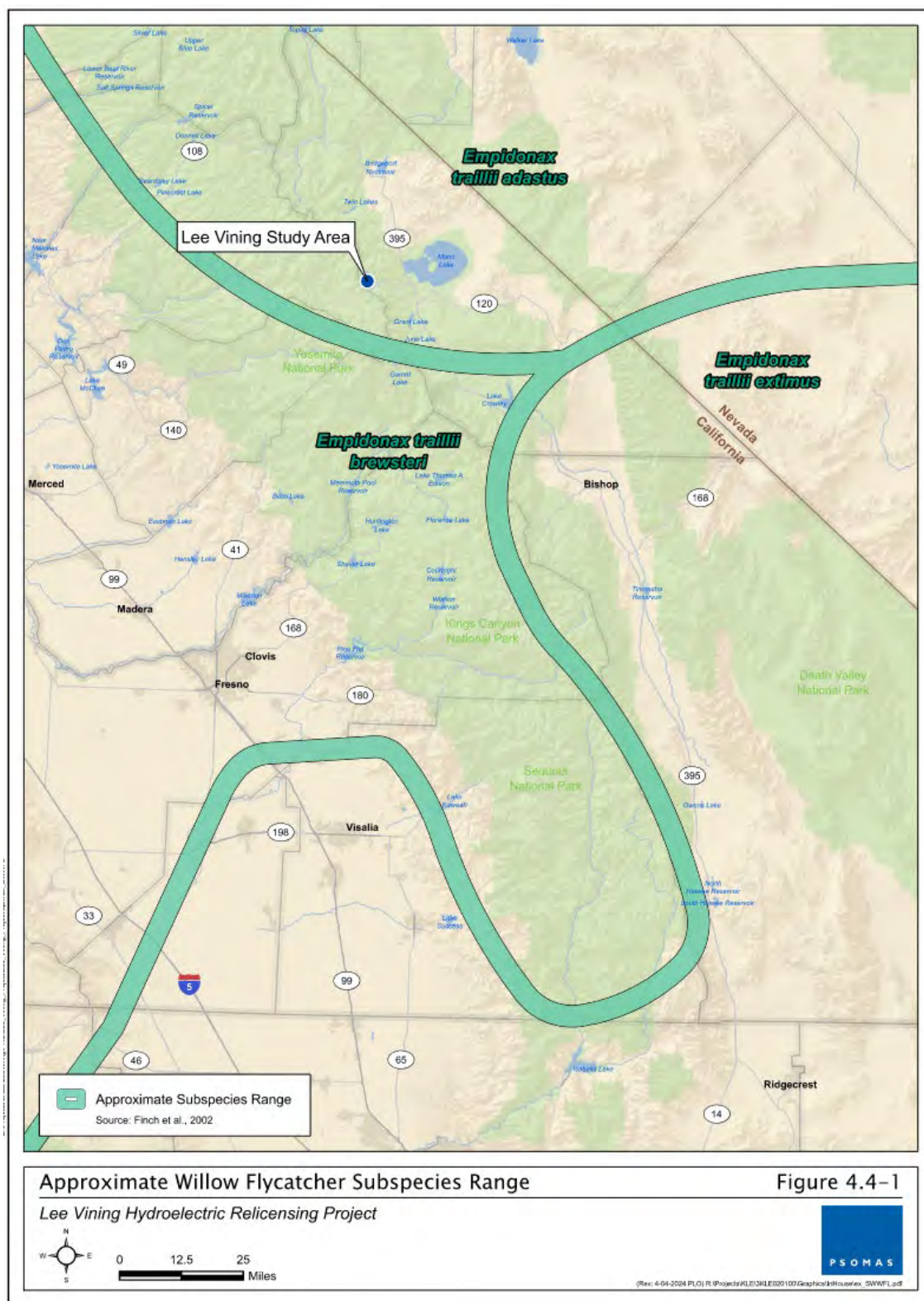
The three subspecies generally occur in different regions across California with the southwestern subspecies occurring south of the Project, the little subspecies occurring west of the Project, and the Great Basin subspecies occurring north and east of the Project. The current known ranges of the three subspecies adjacent to the Willow Flycatcher Study Area are shown on Figure 5.4-1, as taken from the *Final Recovery Plan for Southwestern Willow Flycatcher* (Finch et al., 2002) and reinforced in the *2017 Southwestern Willow Flycatcher 5-Year Review* (USFWS, 2017).

Southwestern willow flycatchers generally tend to nest in central and southern California sites, but there are confirmed nesting records for the southwestern willow flycatcher as far north as Pleasant Valley in Inyo County (CDFW, 2022). The other two subspecies migrate through the southwestern willow flycatcher range and continue northward to their

breeding ranges. The higher elevation sites along the Sierra Nevada range and into the northwestern United States tend to have little willow flycatchers.

In California, the little willow flycatcher occurs in wet meadows and montane riparian habitats from 2,000 to 8,000 feet amsl in elevation and it is a common migrant at lower elevations, primarily in riparian habitats, throughout the state exclusive of the north coast (Zeiner et al., 1990).

Sightings documented in the riparian areas of the Great Basin Desert on the eastern side of the Sierra Nevada and north of the City of Independence are most likely Great Basin willow flycatcher (Unitt, 1987). Specimens taken from northern Inyo and Mono Counties all proved to be of the Great Basin willow flycatcher subspecies (Unitt, 1987). There have been no recorded nesting occurrences for willow flycatcher reported in the literature. The known reported occurrences in the CNDDDB are mapped in Figure 5.4-1.



Source: Finch et al., 2002

Figure 5.4-1. Approximate Willow Flycatcher Subspecies Range Maps in the Vicinity of the Project.

Collectively, all the willow flycatcher subspecies inhabit extensive thickets of low, dense willow (*Salix* spp.) vegetation on the edge of wet meadows, ponds, or backwaters between 2,000 and 8,000 feet amsl (CDFW, 2022). In California, the habitat requirements for breeding willow flycatchers include aboveground water, shrub cover, and dense stands of willow vegetation (CDFG, 1990). The species is associated with willow vegetation that has dense foliage for nesting and cover (Whitmore, 1977; Stafford and Valentine, 1985; Flett and Sanders, 1987). Suitable nesting habitat is also associated with willow vegetation that is at least 4.9 feet tall to provide sufficient foliage cover above nests, which are usually placed about 3 feet above the ground (Sanders and Flett, 1989). Of the three subspecies in California, the southwestern willow flycatcher has the most detailed habitat information published because it is federally listed, but the habitat parameters are applicable to all three subspecies. The following habitat parameters are written for the southwestern subspecies, but the same features are consistent across all three subspecies in California.

The southwestern willow flycatcher occurs in dense riparian habitat along rivers, streams, and other wetlands. Shrubs or trees used for nesting range from 6 feet to 98 feet in height; lower stature thickets tend to occur at higher elevation sites, while taller stature thickets occur at middle and lower elevations (Finch et al., 2002). Typically, southwestern willow flycatchers nest in thickets of trees and shrubs 13 to 23 feet or greater in height, with a dense understory and a high percentage of canopy cover (USFWS, 1995). Nest sites are typically composed of a riparian patch with dense vegetation in the interior or an aggregate of dense patches interspersed with openings. The dense patches are often interspersed with small openings, open water, or small areas of shorter/sparse vegetation that create a mosaic of habitat that is not uniformly dense (Finch et al., 2002). In almost all cases, slow-moving or still surface water and/or saturated soil is present during wet or non-drought years (Finch et al., 2002). Where flycatchers occur along moving streams, those streams tend to be of relatively low gradient (i.e., slow-moving with few or widely spaced riffles). However, hydrological conditions in the southwest can be highly variable both within a season and between years; water availability at a site may range from flooded to dry over the course of a breeding season or year to year (Sogge et al., 2010). Plant species composition of low- to mid-elevation sites range from monotypic stands to mixtures of broadleaf trees and shrubs including willow, cottonwood (*Populus* sp.), coast live oak (*Quercus agrifolia*), ash (*Fraxinus* sp.), alder (*Alnus* sp.), blackberry (*Rubus* sp.), and nettle (*Urtica* sp.) (Finch et al., 2002). They can also nest in riparian habitats dominated by a mix of native and introduced species, such as Russian olive (*Elaeagnus angustifolia*) and tamarisk (*Tamarix* sp.), or in monotypic stands of these introduced species; however, southwestern willow flycatchers rarely nest in giant reed (*Arundo donax*) (Finch et al., 2002). Overall, nest site selection appears to be driven more by plant structure than species composition (Sogge et al., 2010).

Breeding territory size typically ranges from 0.25 acre to 5.7 acres, with most in the range of 0.5 to 1.2 acres (Sogge et al., 2010; Finch et al., 2002). Based on a range-wide review, a patch has an average of 2.7 acres of dense riparian vegetation for each flycatcher territory (Finch et al., 2002). Southwestern willow flycatchers are generally not found nesting in confined floodplains where only a single narrow strip of riparian vegetation less than approximately 33 feet wide develops, although they may use such vegetation during

migration or if it extends out from larger patches (Finch et al., 2002). The structure and size of willow canopy is consistent with data on the collective three subspecies.

Several authors have suggested that willow flycatchers prefer meadows where the willow cover is divided into clumps separated by openings, rather than solid masses of willow (Finch et al., 2002; Sanders and Flett, 1989). On average, willow flycatcher territories in the Sierra Nevada contain at least 0.5 acre of riparian shrub cover, usually dominated by willow (Sanders and Flett, 1989). The shrub layer is rarely continuous. In the Sierra Nevada, willow flycatchers have nested in meadows as small as 1 acre (Stafford and Valentine, 1985) and as large as several hundred acres (Flett and Sanders, 1987). Tree cover that is too dense (greater than 50 percent canopy cover) also creates unsuitable conditions for willow flycatcher nesting (CDFG, 1990).

5.4.2. HABITAT ASSESSMENT

Lee Vining Creek flows east into Mono Lake. Within the Willow Flycatcher Study Area, the stream 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.

The Willow Flycatcher Study Area included in this habitat assessment consists of the reach of Lee Vining Creek between Poole Powerhouse and the reservoir at the LADWP Diversion Dam, which is approximately 5 miles long. Willow vegetation is generally present within the Willow Flycatcher Study Area; 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 and alder. A sparse overstory of pine trees 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, Souler'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 (pine trees) 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; Figure 5.4-1).

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.

5.5. SIERRA NEVADA BIGHORN SHEEP

The Sierra Nevada bighorn sheep is both a federally and state endangered species. On August 5, 2008, the USFWS published the current Final Rule designating approximately 417,577 acres of land as Critical Habitat for the Sierra Nevada bighorn sheep in Tuolumne, Mono, Fresno, Inyo, and Tulare Counties, California (USFWS, 2008). Only a very small portion of the 1997 FERC Project Boundary (less than 1 acre) is within areas mapped as Critical Habitat for Sierra Nevada bighorn sheep. However, this parcel of land where designated Critical Habitat overlaps with the FERC Project Boundary is proposed to be removed from the Project going forward in this DLA (see the Project Lands and Roads [LAND-1] Final Technical Report, which is filed in Volume III of this DLA). In 2007 the USFWS published a recovery plan for the Sierra Nevada bighorn sheep (USFWS, 2007). CDFW is the lead agency implementing plan. The distribution of bighorn sheep is determined by topography, visibility, water availability, and forage quality and quantity. Typical Sierra Nevada bighorn 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 un-cluttered areas where they can use their keen eyesight to detect and avoid predators, such as mountain lion (CDFW, 2024).

The Project occurs at the boundary of two established herds: the Warren Mountain Herd is to the north of Tioga Pass and the Gibb Mountain Herd is to the south of Tioga Pass (CDFW, 2024). Sheep scat was observed incidentally in two locations during the pedestrian portion of the wildlife surveys: approximately 100 feet east of Tioga Lake and along Saddlebag Lake Road approximately 500 feet northeast of Sawmill Campground. Evidence of sheep (such as scat) was expected to be observed during the survey. Because of the generally arid nature of high montane habitats, the presence of wet meadows and lakes would be expected to draw bighorn sheep into the study area to take advantage of these water resources.

6.0 CONSULTATION SUMMARY

In preparation to file the Pre-Application Document (PAD) and Notice of Intent (NOI) filed in August 2021, SCE hosted Terrestrial and Botanical Technical Working Group (TWG)

meetings on January 27, February 24, April 7, and May 26, 2021. These TWG meetings resulted in study requests from Stakeholders to address questions regarding wildlife resources. Notes and materials from these meetings are available on SCE's Project website (www.sce.com/leevining).

SCE filed draft Study Plans with the PAD and NOI on August 12, 2021, to address issues discussed with the TWGs. The Stakeholder comment period for these filings ended on January 18, 2022. SCE reviewed all comments received and drafted Revised Technical Study Plans, which were distributed to the TWGs on February 18, 2022, for another 30-day review period. Stakeholder comments received on the Revised Technical Study Plans were reviewed and incorporated as appropriate in the Final Technical Study Plans, which were filed with FERC on April 25, 2022 (SCE, 2022). Extensive coordination regarding Yosemite toad survey timing and methods occurred between SCE, Psomas, USFS, U.S. Fish and Wildlife (USFWS), California Department of Fish and Wildlife (CDFW), and National Park Service (NPS) before and during survey implementation in 2022 and 2023. Coordination efforts consisted of several calls, in-person meetings, and emails. A summary of the communications are as follows:

- April through June 2022: Coordination with USFWS and CDFW on Yosemite toad survey timing for 2022 season.
- June, July, and August 2022: Discussions/summaries of 2022 survey findings as they occurred after each field event with CDFW and USFWS.
- January 2023: Planning call for 2023 field efforts with CDFW and USFWS.
- March through July 2023: Coordination with USFS, CDFW, and NPS on DNA sample collection, use of existing agency permits for DNA collection, and survey timing for 2023 season.
- August and September 2023: NPS collected Yosemite toad DNA samples and corresponded about probable results timeline.

Ultimately, the agencies and SCE were in full agreement with methods and survey timing for Yosemite toad surveys. A complete compilation of email correspondence, summaries of phone conversations, and in-person meeting summaries will be filed with the Draft License Application's Consultation Log.

Draft Technical Reports were distributed to TWGs on April 16, 2024, for a 60-day comment period. On May 14, 2024, SCE held a public meeting at the Lee Vining Community Center to discuss the draft reports and study findings to date. On June 12, 2024, at the end of the comment period, comments were received from USFS, USFWS, CDFW, State Water Resources Control Board, and Mono Lake Committee. All comments received related to Study TERR-2 are included in Table 6-1 below. Responses to Stakeholder comments on the 2023 Draft Technical Report are included in Table 1-1 in Volume III of the DLA.

Table 6-1. Consultation Summary—Response to Comments

Comment Number	Entity	Date/Forum	Comment	SCE Response
1	CDFW	6/29/2022 Phone discussions	Discussion about survey results and field observations	The results and observations discussed are included in the Terrestrial Wildlife Technical Memorandum.
2	CDFW	7/25/2022 Phone discussion	Discussion about survey results and field observations	The results and observations discussed are included in the Terrestrial Wildlife Technical Memorandum.
3	CDFW	12/12/2022 Virtual meeting	Discussion about 2022 field observations and 2023 Study Plan revisions and Study Area expansion.	Revised study methods were implemented as discussed as was the expanded Study Area.
4	CDFW	12/17/2022 Email communications	CDFW recommends applying for the USFWS Take Permit and the CDFW Scientific Collecting Permit necessary for collecting of DNA samples of ESA/CESA listed species.	Project team partnered with Yosemite National Park biologist who holds the necessary permits to collect DNA samples of the target species. (response updated August 2024)
5	USFWS, CDFW	1/6/2023 Virtual meeting	Discussion about 2023 Study Plan revisions and Study Area expansion.	Revised study methods were implemented as discussed, as was the expanded Study Area.
6	USFS	2/9/2023 In-person discussion	Discussions about 2022 field observations and 2023 study methods.	Study methods were implemented as discussed.
7	CDFW	7/27/2023 Email communications	Confirmation of interest and contact information for submitting DNA sample for large carnivore species analysis.	Project team has a sample to submit for CDFW analysis.
8	CDFW	8/8/2023 In-person discussion	Confirmed interest in large carnivore sample for DNA analysis.	Delivered sample for analysis at CDFW office.
9	CDFW	11/29/2023	Large carnivore DNA analysis complete.	The species identified has already been documented by other survey methods and is included in the wildlife compendium of the Terrestrial Wildlife Technical Report.

Comment Number	Entity	Date/Forum	Comment	SCE Response
10	USFS	1/12/2024 In-person discussion	Discussions about survey results and field observations	The details discussed are provided in the Terrestrial Wildlife and Yosemite Toad Technical Reports.

Bd = *Batrachochytrium dendrobatidis*; CDFW = California Department of Fish and Wildlife; CESA = California Endangered Species Act; CNDDB = California Natural Diversity Database; DLA = Draft License Application; FERC = Federal Energy Regulatory Commission; ft = feet; FWS = Fish and Wildlife Service; O&M = operation and maintenance; PAD = Pre-Application Document; SCE = Southern California Edison; TWG = Technical Working Group; USFS = U.S. Forest Service; VES = visual encounter survey; YOTO = Yosemite Toad

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APPENDIX A YOSEMITE TOAD TECHNICAL REPORT

**SOUTHERN CALIFORNIA EDISON
Lee Vining Hydroelectric Project
(FERC Project No. 1388)**



**YOSEMITE TOAD
FINAL TECHNICAL REPORT**



SEPTEMBER 2024

SOUTHERN CALIFORNIA EDISON

Lee Vining Hydroelectric Project (FERC Project No. 1388)

YOSEMITE TOAD FINAL TECHNICAL REPORT

Southern California Edison
2244 Walnut Grove Avenue
Rosemead, CA 91770

September 2024

Support from:



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LIST OF ACRONYMS AND ABBREVIATIONS

amsl	above mean sea level
CDFW	California Department of Fish and Wildlife
CNDDDB	California Natural Diversity Database
FERC	Federal Energy Regulatory Commission
GPS	global positioning system
O&M	operation and maintenance
Project	Lee Vining Hydroelectric Project (FERC Project No. 1388)
SCE	Southern California Edison
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service

1.0 INTRODUCTION

This Technical Report transmits findings of literature research and field studies specific to the Yosemite toad (*Anaxyrus canorus*) in association with the *General Wildlife Resources Survey (TERR-2) Technical Study Plan* (Study Plan) in support of Southern California Edison (SCE) Company's Lee Vining Hydroelectric Project (Project) relicensing effort, Federal Energy Regulatory Commission (FERC) Project Number 1388. The Final Technical Study Plan was filed with FERC in April 2022 (SCE, 2022).

1.1. PROJECT DESCRIPTION AND LOCATION

SCE is the licensee, owner, and operator of the Project. The Project is located 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 (see Figure A-1 in Attachment A). The 11.25-megawatt Project is situated on Lee Vining Creek, largely within the Inyo National Forest managed by the U.S. Forest Service (USFS); the remaining Project lands are privately owned.

The Project consists of three dams and reservoirs, an auxiliary dam, a flowline consisting of a pipeline and penstock, and a powerhouse. These features and facilities all occur within a defined boundary, hereafter referred to as the FERC Project Boundary. 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 (O&M) of the Project.

1.2. PURPOSE AND NEED

The purpose of this study is to provide supplemental information on the occurrence and distribution of the Yosemite toad, a species listed as threatened under the federal Endangered Species Act. The data in this study are needed by SCE, FERC, federal and state resource agencies, and interested Stakeholders to determine the potential for Project O&M activities to affect local populations of the species. Further, the data from this study are needed to help the U.S. Fish and Wildlife Service (USFWS) analyze and understand the potential Project effects to Yosemite toad and how those effects should be addressed.

1.3. STUDY OBJECTIVES

The study objectives identified in the Study Plan are to:

- Determine persistence of known Yosemite toad populations within the Project Area and identify active breeding locations in areas subject to potential effects by the Project's routine O&M.
- Determine interactions between dispersed recreational use and breeding habitat for Yosemite toad.

- Develop sufficient data for informal and formal consultation needs for USFWS with respect to the Yosemite toad.

1.4. EXISTING CONDITIONS

1.4.1. TOPOGRAPHY

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 (3,960 meters) above mean sea level (amsl) along the Sierra Nevada peaks to approximately 6,400 feet (1,950 meters) amsl at the shoreline of Mono Lake (Millar and Woolfenden, 1999), with the basin floor generally below 7,000 feet (2,130 meters) (Vorster, 1985).

The three Project reservoirs include Saddlebag Lake, Tioga Lake, and Ellery Lake. Saddlebag Lake lies within a glacially carved U-shaped valley. Steep, 1,200-foot (365 meter) ridges bound the lake on the east and west sides, and talus slopes form most of the rock shoreline (FERC, 1992). Tioga Lake lies in a valley on glacial till with a scattering of rounded rock outcrops (FERC, 1992). Ellery Lake has a rocky shoreline with several areas of talus slopes entering the lake from the steep terrain along the southern margin.

Lee Vining Creek drains the eastern Sierra Nevada crest and Glacier Creek is a tributary that flows from Tioga Lake. Mount Dana (13,053 feet [3,978 meters] amsl), the highest peak in Mono Basin, and several other peaks above 12,000 feet (3,560 meters) 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 (2,895 meters) amsl to Poole Powerhouse at 7,825 feet (2,385 meters) amsl (Jones & Stokes Associates, 1993).

The 1992 Final Environmental Assessment (FERC, 1992) for the Project describes Lee Vining Creek as having three distinct stream reaches differentiated by habitat and channel morphology between Saddlebag Dam and Ellery Lake:

- 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 (383 meters) 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).
- Lee Vining Creek from the confluence of Slate Creek to the confluence of Glacier Creek. This reach is 10,750 feet (3,280 meters) long and, as of 1992, reportedly comprised two low gradient meadow sections, totaling 7,880 feet (2,400 meters) in stream length, separated by a steeper gradient canyon of 2,870 feet (875 meters) stream length.

- Lee Vining Creek from the confluence of Glacier Creek to Ellery Lake. This reach is 2,406 feet (733 meters) long, is wide and relatively shallow, and as of 1992, reportedly comprised riffle, run, and cascade habitat with cobble and gravel substrate.

1.4.2. VEGETATION TYPES

Thirteen vegetation communities and other areas were identified in 2022 during the botanical survey conducted for the Project: 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.

1.4.2.1. Alpine Grasses and Forbs

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 (*Erodium nudum* var. *deductum*), pale fragrant monardella (*Monardella odoratissima* ssp. *pallida*), Sierra beardtongue (*Penstemon heterodoxus* var. *heterodoxus*), Newberry's beardtongue (*Penstemon newberryi*), and compact spear phacelia (*Phacelia hastata* var. *compacta*).

1.4.2.2. Barren

This landcover consists of exposed bedrock, cliffs, and scree slopes with limited vegetation. Areas with soil development are mapped as non-vegetated.

1.4.2.3. Developed

Developed areas are unvegetated and consist of buildings, paved roads, and parking lots.

1.4.2.4. Lakeshore

The area around the Saddlebag Lake has a fluctuating shoreline that is dependent on climatic conditions (e.g., rainfall, snowpack) and water releases. During the July and August 2022 botanical surveys, water levels in Saddlebag Lake were low and much of the lakeshore was exposed. This area contained scattered vegetation such as mountain bent grass (*Agrostis humilis*), rough bent grass, and abrupt-beaked sedge.

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.

Tioga Lake maintains a more stable water level with highly vegetated shorelines occupied by stable large woody debris. 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.

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.

1.4.2.5. Lodgepole Pine

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*).

1.4.2.6. Mixed Conifer–Fir

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*).

1.4.2.7. Non-vegetated

This landcover lacks vegetation or has sparse vegetation. It includes 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.

1.4.1. QUAKING ASPEN

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*).

1.4.1.1. Wet Meadow

This vegetation type is dominated by a variety of sedges and rushes such as abrupt-beaked sedge, Mexican rush (*Juncus mexicanus*), Parry's rush (*Juncus parryi*), and Sierra woodrush (*Luzula orestera*). Other species include primrose monkeyflower (*Erythranthe primuloides*), Sierra gentian (*Gentianopsis holopetala*), ranger's button

(*Angelica capitellata*), and Pacific onion (*Allium validum*). The habitat is wetter than the alpine grasses and forbs vegetation type, described above.

1.4.1.2. Whitebark Pine–Alpine Grasses and Forbs

This vegetation type is characterized by the presence of whitebark pine (*Pinus albicaulis*). A relatively small amount of lodgepole pine or limber pine (*Pinus flexilis*) is also present. The understory contains species typical of the alpine grasses and forbs and the lodgepole pine vegetation types.

1.4.1.3. Whitebark Pine–Lodgepole Pine

This vegetation type contains a mix of whitebark pine and lodgepole pine. A relatively small amount of lodgepole pine or limber pine is also present. The understory contains species typical of the alpine grasses and forbs and the lodgepole pine vegetation types.

1.4.1.4. Water

Water occurs within all three Project lakes and within Lee Vining Creek and associated tributaries. This landcover is considered unvegetated.

1.4.1.5. Willow

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*), narrow-leaved willow (*Salix exigua*), Jepson's willow (*Salix jepsonii*), and gray-leaved willow (*Salix orestera*). Co-occurring species may include fireweed, American dogwood (*Cornus sericea*), shrubby cinquefoil (*Dasiphora fruticosa*), and Wood's rose (*Rosa woodsia*).

2.0 SPECIES BACKGROUND

Most of the species description below was taken from the March 3, 2020, Biological Opinion issued by the USFWS to Yosemite National Park for Wilderness Pack Stock Use (USFWS, 2020). Portions of this description have been updated per more recent findings on the species.

2.1. LISTING STATUS

The Yosemite toad was listed as a threatened species on April 29, 2014, under the Endangered Species Act of 1973 (USFWS, 2014). Critical Habitat was designated for this species on August 26, 2016, and occurs in Alpine, Fresno, Inyo, Madera, Mariposa, Mono, and Tuolumne Counties (USFWS, 2016). The entire extent of the FERC Project Boundary, including and upstream from Rhinedollar Dam, is located within this designated Critical Habitat. The Yosemite toad population in the Project Area are included in Critical Habitat Unit 5, which includes portions of Mono, Mariposa, Madera, and Tuolumne Counties. This unit is currently occupied and contains the physical or biological features essential to the conservation of the species. This unit contains a high

concentration of Yosemite toad breeding locations, represents a variety of habitat types utilized by the species, has high genetic variability, and, due to the long-term occupancy of this unit, is considered an essential locality for Yosemite toad populations. The Tuolumne Meadows / Cathedral unit is an essential component of the entirety of this critical habitat designation because it provides continuity of habitat between adjacent units, as well as providing for a variety of habitat types necessary to sustain Yosemite toad populations under various climate regimes.

Primary Constituent Elements

As part of the species listing under the Endangered Species Act, USFWS identified Primary Constituent Elements of Yosemite toad habitat (USFWS, 2016). Per the USFWS documentation, the Primary Constituent Elements specific to the Yosemite toad physical or biological features and habitat characteristics required to sustain the species' life history processes are composed of:

1. Aquatic breeding habitat.

- a. This habitat consists of bodies of fresh water, including wet meadows, slow-moving streams, shallow ponds, spring systems, and shallow areas of lakes, that:
 - i. Are typically (or become) inundated during snowmelt;
 - ii. Hold water for a minimum of 5 weeks, but more typically 7 to 8 weeks; and
 - iii. Contain sufficient food for tadpole development.
- b. During periods of drought or less-than-average rainfall, these breeding sites may not hold surface water long enough for individual Yosemite toads to complete metamorphosis, but they are still considered essential breeding habitat because they provide habitat in most years.

2. Upland areas.

- c. This habitat consists of areas adjacent to or surrounding breeding habitat up to 0.78 mile (1.26 kilometers) in most cases (that is, depending on surrounding landscape and dispersal barriers), including seeps, springheads, talus and boulders, and areas that provide:
 - i. Sufficient cover (including rodent burrows, logs, rocks, and other surface objects) to provide summer refugia;
 - ii. Foraging habitat;
 - iii. Adequate prey resources;
 - iv. Physical structure for predator avoidance;

- v. Overwintering refugia for juvenile and adult Yosemite toads;
 - vi. Dispersal corridors between aquatic breeding habitats;
 - vii. Dispersal corridors between breeding habitats and areas of suitable summer and winter refugia and foraging habitat; and/or
 - viii. The natural hydrologic regime of aquatic habitats (the catchment).
- d. These upland areas should also maintain sufficient water quality to provide for the various life stages of the Yosemite toad and its prey base.

2.2. DESCRIPTION

The Yosemite toad was originally described as *Bufo canorus* by Camp (1916). Frost et al. (2006) divided the paraphyletic¹ genus *Bufo* into three genera, assigning the North American toads, including the Yosemite toad, to the genus *Anaxyrus*.

The Yosemite toad is a moderately sized amphibian ranging in size from 1.2 to 2.8 inches (Lannoo, 2005; Dodd, 2013). Juveniles have a thin mid-dorsal stripe that disappears or is reduced with age, a process which occurs more quickly in males (Lannoo, 2005; Dodd, 2013). The toad's iris is dark brown with gold iridophores² (Dodd 2013), and it has large parotid glands that are rounded to slightly oval in shape, situated at a distance less than one gland-width apart. Male Yosemite toads are smaller than females, with less conspicuous warts (Stebbins, 1951; Stebbins, 2003; Lannoo, 2005; Stebbins and McGinnis, 2012; Dodd, 2013; Green et al., 2014). Males have a nearly uniform dorsal coloration of yellow green, olive drab, or darker greenish brown, whereas females have black spots or blotches edged with white or cream set against a gray, tan, or brown background color (Jennings and Hayes, 1994; Lannoo, 2005; Dodd, 2013; Green et al., 2014).

Yosemite toad tadpoles exhibit a uniform black coloration, concealing their coiled intestines from view. The snout, when viewed in profile, appears blunt and rounded from above (Karlstrom and Livezey, 1955; Stebbins, 1951, 2003). The dorsal fin of Yosemite toad tadpoles is transparent and marked with a few relatively large branched melanophores, with the tail reaching its greatest depth about midway along its length (Karlstrom and Livezey, 1955). Tadpoles measure between 0.39 to 1.46 inches (10 to 37 millimeters) in length and develop two upper and three lower rows of labial teeth (or denticles), with a gap in the first upper row (Stebbins, 1951, 2003; Karlstrom and Livezey, 1955).

Yosemite toad eggs are laid in two strings (one from each ovary), appearing as individual strands, a double strand, or variously folded to form a radiating network or a cluster of four to five eggs deep (Karlstrom and Livezey, 1955; Kagarise Sherman, 1980). Each strand is enveloped by two jelly layers, with an outer thinner envelope creating a scalloped

¹ A group of animals including a common ancestor and some, but not all, of the descendants.

² Iridophores are the cells that are made up of stacks of thin protein plates that function as multilayer reflectors.

casing due to the way the jelly constricts around each egg, and a thicker inner envelope individually surrounding each egg (Karlstrom and Livezey, 1955).

2.3. CURRENT RANGE AND DISTRIBUTION

The Yosemite toad is endemic to the high-elevation Sierra Nevada in California, ranging from the Blue Lakes region north of Ebbetts Pass in Alpine County to just south of Kaiser Pass in the Evolution Lake / Darwin Canyon area in Fresno County (Jennings and Hayes, 1994; Lannoo, 2005; Liang et al., 2010; Liang and Stohlgren, 2011; Stebbins and McGinnis, 2012; Dodd, 2013; Green et al., 2014). Most of the Yosemite toad's range occurs on lands managed by the USFS (72 percent; USFS, 2014) or National Park Service.

2.4. HABITAT AND LIFE HISTORY

Yosemite toads typically inhabit high-elevation wet meadows and lakeshores surrounded by forests or shrublands (Camp, 1916; Lannoo, 2005; Stebbins and McGinnis, 2012; Wang, 2012; Dodd, 2013). The toad is capable of successfully utilizing both large and small patches of potential habitat but prefers sites with less variation in mean annual temperature (Liang, 2010). Breeding and rearing takes place at the time of snow melt (Psomas field observation) and after snowmelt (generally May to June) in shallow warm waters of primarily wet meadows, but also small permanent and ephemeral ponds, lake edges, and slow-moving streams (Karlstrom and Livezey, 1955; Kagarise Sherman and Morton, 1993; Martin, 2008). Liang's (2010) study in the Sierra National Forest highlighted that breeding sites were likely to be in seasonal waters with warmer water temperatures, facing a southwesterly direction. Knapp (2005) in Yosemite National Park associated breeding occurrence with high elevations and meadow shorelines, while Roche et al. (2012) found positive correlations between annual occupancy and annual precipitation. In a comprehensive 8-year study across 14 watersheds (2002 to 2009), Brown et al. (2012) discovered that only 30 percent of 61 breeding sites were consistently occupied, and most watersheds had 1 to 2 consistently occupied sites, with others occupied intermittently. These unoccupied sites remain important because they are often reoccupied in later years. The reasons for these patterns, whether due to small population sizes or variations in habitat and environmental conditions, remain unclear (Brown et al., 2012).

Males emerge first from overwintering sites and form breeding choruses (Kagarise Sherman, 1980; Kagarise Sherman and Morton, 1984). Breeding occurs over a few days to a few weeks, with females leaving breeding sites before males (Kagarise Sherman, 1980; Brown et al., 2012). Females lay a large clutch, sometimes 1,000 to 2,000 eggs in a single season, and may either split their clutches or lay them communally with other toads (Kagarise Sherman, 1980; Brown et al., 2015). Clutches are laid in shallow water (1.5 to 3 inches), along the edges of small pools or flooded meadows (Kagarise Sherman, 1980; Roche et al., 2012). Eggs hatch in 4 to 15 days; tadpoles metamorphose in 40 to 50 days and do not overwinter (Jennings and Hayes, 1994; Brown et al., 2014). The Yosemite toad is a late-maturing and long-lived species, known to live up to 18 years (Kagarise Sherman and Morton, 1984). Females first breed when they are 4 to 6 years of

age (Kagarise Sherman, 1980). Most adult males appear to breed annually, whereas females may skip years between breeding (Kagarise Sherman, 1980; Brown et al., 2012).

Adults are difficult to find outside of the breeding season, so less is known about non-breeding habitat, where they spend the majority of their lives. One study conducted in subalpine forest in the Stanislaus National Forest found that toads dispersed upslope, generally along ephemeral streams, seeps, or springs with lush vegetation (Martin, 2008). Another study conducted in a drier habitat in the Sierra National Forest demonstrated that toads extensively used upland habitats and were found most often in burrows, both shallow and underground, but also under logs, rocks, and tree stumps (Liang, 2010). Martin (2008) reported the mean total home range for the Yosemite toad in the Stanislaus National Forest Study Area was 2.09 acres (8,457.93 square meters). In the Sierra National Forest, Yosemite toads moved up to 3,780 feet (1,260 meters) from their breeding pools, with a mean distance of 810 feet (270 meters) (Liang, 2013). Morton (1981) reported several female Yosemite toads 2,250 feet (750 meters) from the nearest breeding pools. On the Stanislaus National Forest, Martin (2008) reported maximum dispersal distances for Yosemite toads at 1,973 feet (657.44 meters) from breeding pools to upland foraging habitat; however, most Yosemite toads observed traveled less than 750 feet (250 meters).

Martin (2008) found that this species conducts much of its post-reproductive activity at night and that many of the long-range migrations took place nocturnally. Most of the longer-distance movements occur in the 2 months after the breeding season. Additionally, there appear to be some sex-specific differences in non-breeding habitat use and movement: females tend to range further than males (Martin, 2008; Liang, 2010; Morton and Pereyra, 2010). Morton and Pereyra (2010) found that during late July and August at Tioga Pass, females were more likely to move farther upland to rocky hillside habitats and males stayed in lowland meadow habitats near breeding ponds. Adult females appear to spend much of the active season in upland habitats except for the few days spent breeding every 2 to 3 years (Kagarise Sherman, 1980).

To overwinter, toads may use rodent burrows, crevices under rocks and stumps, and root tangles at the base of willows (Davidson and Fellers, 2005; Kagarise Sherman, 1980; Martin, 2008). Some metamorphs appear to overwinter their first year in the terrestrial meadow habitat adjacent to their rearing site but move to more distant terrestrial habitat during mid-summer of their second year (Kagarise Sherman and Morton, 1993; Morton and Pereyra, 2010). Individual Yosemite toads show high fidelity to both breeding meadows and terrestrial habitats (Brown et al., 2012; Kagarise Sherman and Morton, 1984; Liang, 2010).

Detecting Yosemite toads is difficult because of short suitable survey periods for each life stage. Adult males are most easily detected during the short breeding window at snowmelt (1 to 2 weeks). As tadpoles are present for a longer period of time (6 to 8 weeks), they could be easier to find, but again, surveys must be carefully timed. Furthermore, even the breeding meadows and breeding areas within the meadows can be highly variable according to snowpack and management activities. Toads are rarely

seen once they disperse into their upland habitats, and thus determining presence or absence is challenging (Brown et al., 2012).

Diet has not been well-characterized, but the toads are thought to be largely ambush predators and consume primarily terrestrial invertebrates during the non-breeding active season (Mullally, 1953). Martin (2008) observed that much of the foraging activity in terrestrial habitats for this species appears to occur at night. Grinnell and Storer (1924) reported stomach contents, including tenebrionid beetles, weevils, large ants, a centipede, and fir needles.

In 1991, Martin analyzed stomach contents of Yosemite toads at various life stages, revealing a diverse range of prey items from six insect orders and two arachnid groups. The data suggested a shift in prey size with body size. Newly metamorphosed toads primarily consumed spider mites and owl flies, while 2-month-old metamorphs shifted to small spiders and chalcid wasps. One-year-olds predominantly consumed ants, and adult toads exhibited varied diets. Tadpoles are grazers and highly opportunistic (Grinnell and Storer, 1924). Opportunistic feeding behavior, such as swarming on a dead ground squirrel, has been documented in tadpoles (Martin, 1991). Instances of Yosemite toads feeding on the tadpoles of chorus frogs (*Pseudacris regilla/sierrae*) and predaceous diving beetle (family *Dytiscidae*) larvae have been observed, though the opportunistic nature of these interactions remains unclear (Brown et al., 2015).

2.5. STATUS AND THREATS OVERALL

The species historically inhabited elevations ranging from 4,790 to 11,910 feet (1,460 to 3,630 meters) (Stebbins, 2003), and was most abundant above 8,000 feet (2,438 meters) below permanent snow and ice. Occupancy studies indicate a decline of greater than 50 percent of former sites range-wide (Stebbins and Cohen, 1995; Drost and Fellers, 1996). Current populations are thought to be very small (fewer than 20 adult males). The only long-term, site-specific population study of the Yosemite toad at Tioga Pass Meadow from 1971 to 1991 found a dramatic decline from 258 males entering breeding pools, down to 28 in the early 1980s, with only one found in 1991 (Kagarise Sherman et al., 1993). Within its current range on National Forest lands, breeding is currently found in only 22 percent of watersheds (Brown et al., 2012). The Yosemite toad is imperiled by a variety of factors, especially damage and loss of habitat, livestock grazing, chytrid fungus, and global climate change (Lannoo, 2005; Davidson and Fellers, 2005; Martin, 2008; Green et al., 2014). High meadow habitat quality in the western United States, and specifically the Sierra Nevada, has been degraded by a variety of stressors over the last century (Ratliff, 1985; Vale, 1987).

Because Yosemite toads rely on shallow, ephemeral water, they may be particularly sensitive to even minor effects on their habitat. Drying of meadow systems is one of the more significant changes, primarily because of widespread historic livestock overgrazing (Ratliff, 1985; Menke et al., 1996; Lind et al., 2011; Weixelman et al., 2011; McIlroy et al., 2013). Timber harvest, road construction, and an altered fire regime has introduced additional disturbance pressures to meadows, including tree encroachment. Approximately 33 percent of the toad's current range is within active USFS grazing

allotments. Besides degradation of meadow habitat, livestock and recreation (including hikers, pack animals, and vehicles) can directly affect individual toads through trampling, collapse of rodent burrows, and harassment. Breeding toads and metamorphs are particularly vulnerable to such trampling (Martin, 2008).

Although effects of road and trail fragmentation on Yosemite toad populations is unknown, there is evidence that roads and trails reduce Yosemite toad connectivity (Maier, 2018). Diseases, especially chytrid fungus, also play an important role in Yosemite toad population dynamics. Although Yosemite toad individuals appear less prone to epidemic outbreaks than mountain yellow-legged frogs (*Rana sierra/mucosa*) (Green and Kagarise Sherman, 2001; Brown et al., 2015), pathogen prevalence appeared to coincide with recent declines (Fellers et al., 2007; USFWS, 2013). From 2006 to 2011, Dodge and Vredenburg (2012 as cited in USFWS, 2013; Dodge et al., 2023) found infection intensities between 17 and 26 percent, and that juvenile toads were more likely to be infected. In an experimental study, 100 percent of juvenile toads exposed to chytrid fungus became infected and died within 25 days (Lindauer, 2018). Yosemite toads are expected to be vulnerable to a warming climate, but recent genetic research illustrated that the genetic diversity of Yosemite toads in Yosemite National Park may allow for local adaptation to climate change. Maier (2018) identified four main lineages of Yosemite toad in Yosemite National Park and patterns of tadpole development differed between lineages. For example, tadpoles developed faster in one lineage, which may prove advantageous if meadows dry at a faster rate in a warming climate. As the majority of remaining populations are likely small and isolated, they are vulnerable to stochastic environmental events and loss of genetic diversity (USFWS, 2014). Additionally, the Yosemite toad's high fidelity to breeding and non-breeding sites can increase the vulnerability of small populations when individuals return to habitats that are no longer suitable.

3.0 STUDY AREA

The initial Yosemite Toad Study Area was derived from a review of the existing literature. The study area consisted of the known Yosemite toad occupied locations adjacent to the FERC Project Boundary and other potentially suitable breeding habitat areas, based on a review of aerial imagery. These areas included:

- The pool southeast of Saddlebag Lake
- The California Natural Diversity Database (CNDDDB)-identified area at the northwest end of Saddlebag Lake
- The inlets at Tioga Lake
- The areas downstream of Tioga Dam along access roads

Based on the initial field observations in early 2022, additional areas of potentially suitable breeding habitat along Lee Vining Creek were added to the survey later in 2022. Figure A-2 in Attachment A shows the area surveyed in 2022 to identify potentially suitable breeding habitat plus the habitat included in the preliminary focused visual encounter

surveys. Prior to both the 2022 and 2023 field seasons, the Project team coordinated with the USFWS and the California Department of Fish and Wildlife (CDFW) to prioritize the survey locations. Based on coordination with the agencies, the 2023 Yosemite toad survey field season focused on five regions:

- Northern Saddlebag Lake
- South of Saddlebag Lake
- Upper Lee Vining Creek
- Lower Lee Vining Creek
- Tioga Lake

Figure A-3 in Attachment A shows the prioritized potential breeding habitat included in the focused visual encounter surveys for the 2023 field season. These areas are hereafter referred to as the study area (note: the south of Saddlebag Lake and upper Lee Vining Creek regions share one map page).

The Northern Saddlebag Lake region includes the margins of the northern half of Saddlebag Lake, the northern inlets to the lake coming from Greenstone Lake, and some pools along the northern portion of Greenstone Lake. The south of Saddlebag Lake region includes the two pools south of Saddlebag Lake (supporting a well-established Yosemite toad population), a large pool within the Sawmill Campground, a small meadow located south of the trail into the Sawmill Campground, and a small pool located along a southwestern-facing slope approximately 1,345 feet (410 meters) south of Saddlebag Lake and approximately 1,345 feet (410 meters) northeast of Sawmill Campground. The upper Lee Vining Creek region is composed of a large, elevated meadow complex located downstream from the Slate Creek–Lee Vining Creek intersection. The Lower Lee Vining Creek region is composed of the Lee Vining Creek basin extending downstream from the upper Lee Vining Creek region to the intersection of Lee Vining Creek with the Junction Campground. The Tioga Lake region consist of all potential breeding habitat along the margins of Tioga Lake up to 200 feet (60 meters) out from the FERC Project Boundary, including the major inlets from the south and the minor inlets from the east and west.

4.0 METHODS

The Study Plan details the proposed study area, methods, and schedule to meet the study objectives identified for Yosemite toad (SCE, 2022). As a result of the observations made during the initial field work and additional consultation with the resource agencies, the field data collected was modified and expanded. The revised methods implemented are described below.

4.1. LITERATURE REVIEW

Prior to conducting field surveys, the following sources were reviewed to identify known and other potential areas to survey for Yosemite toad and potentially suitable breeding

habitat. The primary sources are listed below; however, the references section of this Technical Report includes the additional literature and databases reviewed for this report.

- Aerial and infrared imagery collected in 2021 for vegetation surveys conducted for existing license requirements;
- Movements and Habitat Use of Yosemite Toads (*Anaxyrus* [formerly *Bufo*] *canorus*) in the Sierra National Forest, California (Liang, 2013);
- Fine-Scale Habitat Characteristics Related to Occupancy of the Yosemite Toad, *Anaxyrus canorus* (Liang, et al., 2017);
- Habitat suitability of patch types: A case study of the Yosemite toad (Liang and Stohlgren, 2011);
- Habitat use by Yosemite toads: life history traits and implications for conservation (Morton and Pereyra, 2010);
- Occurrence data provided by CDFW and USFS biologists;
- iNaturalist;
- *Designation of Critical Habitat for the Sierra Nevada Yellow-Legged Frog, the Northern DPS [distinct population segment] of the Mountain Yellow-Legged Frog, and the Yosemite Toad* (USFWS, 2016);
- Decline, Movement and Habitat Utilization of the Yosemite Toad (*Bufo canorus*): An Endangered Anuran Endemic to the Sierra Nevada of California (Martin, 2008); and
- Yosemite Toad Conservation Assessment (Brown, et al., 2015).

4.2. VISUAL ENCOUNTER SURVEYS

Focused visual encounter surveys for Yosemite toad were performed within potential breeding habitat in the study area for 2 consecutive years. Two survey years were performed to document previously unknown breeding locations. Further, the 2022 field season had lower-than-average snowfall.³ This lack of normal snowfall caused potential breeding ponds to dry out early in the season. The 2023 field season was performed to observe breeding in those ponds and other identified potential breeding areas because 2023 was an above average precipitation year.

Surveys were performed during the daytime starting at least 2 hours after sunrise to coincide with warmer air temperatures and peak toad activity periods. The first survey visit in 2022 (June 1) was determined in cooperation with CDFW and per observations of the snow conditions made by SCE Operations staff. All parties agreed that enough snow

³ The average snow depth in Tioga Pass during the April measurements (between 1939 and 2023) is 68 inches. The same measurement in March of 2022 was 34 inches (50 percent of average) and in April of 2023 was 144 inches (211 percent of average) (NRCS, 2023).

had melted to potentially allow for toad breeding. The first survey in 2023 (July 6) was determined using similar observation data on the remnant snowpack made by SCE Operations staff. Table 4.2-1 lists the survey dates, the biologist(s) performing the survey, and any study area accessibility issues.

Table 4.2-1. Survey Dates and Study Area Accessibility

Survey Year	Survey Date	Surveying Biologists	Accessibility Notes
2022	June 1–2	Steve Norton, Jonathan Aguayo	Tioga Lake completely thawed. Saddlebag Lake mostly frozen. Northern Saddlebag completely covered in snow. Open water in southern Saddlebag pool was amphibian-accessible.
	June 15–16	Steve Norton, Jason Berkley	Saddlebag Lake completely thawed. Northern Saddlebag no longer covered in snow.
	July 26–27	Steve Norton, Jonathan Aguayo	All areas were accessible.
	August 9–11	Jason Berkley	Upper Lee Vining Creek area added to survey area.
	August 23–24	Steve Norton, Jason Berkley	All areas accessible.
2023	July 6–7	Steve Norton, Sarah Berryman	Ellery Lake thawed. Tioga Lake mostly frozen. Saddlebag Lake Road closed to vehicles; biologists entered on foot. Southern Saddlebag pool covered by snow and not amphibian-accessible. West side of Lee Vining Creek inaccessible to biologists due to high creek flows and snowpack.
	July 13–14	Steve Norton, Sarah Berryman	Saddlebag Lake Road partially plowed. Tioga Lake completely thawed. Saddlebag Lake mostly frozen. Open water amphibian-accessible in southern Saddlebag pool. Western Lee Vining Creek (both upper and lower portions) remained inaccessible to biologists due to high flows.
	July 21–22	Jason Berkley, Sarah Berryman	All of Lower Lee Vining Creek accessible by biologists.
	July 27–28	Jason Berkley	Upper Lee Vining Creek accessible by biologists.
	August 1–2	Jason Berkley, Jonathan Aguayo	All areas accessible.
	August 9–11	Steve Norton, Sarah Berryman	All areas accessible.
	August 23	Steve Norton	All areas accessible.
	September 20–21	Jason Berkley	All areas accessible.
	October 10–11	Steve Norton	Pool south of Saddlebag Lake frozen over.

Survey Year	Survey Date	Surveying Biologists	Accessibility Notes
	October 31–November 1	Jason Berkley	Toga Lake remains thawed, but Ellery Lake now mostly frozen. Recent snow on ground.

The visual encounter surveys consisted of pedestrian, diurnal searches to determine the presence of any species in the *Anaxyrus* genus (hereafter referred to as “toad”). Binoculars were used to directly observe wildlife (amphibian or otherwise) from a distance to minimize potential trampling risk to Yosemite toads. Further, care was taken to not trample sensitive habitat, such as wet meadow areas potentially supporting Yosemite toad tadpoles, subadults, and adults. All wildlife species observed directly or indirectly (including observations of species’ evidence such as scat, footprints, burrows, inactive nests, eggs strings, etc.) were recorded in field notes. Any evidence of significant pedestrian or bicycle traffic observed during the surveys in potential toad breeding habitat was also noted. All life stages of toad were sought during the surveys, including eggs, tadpoles, subadults, and adults. Lake shorelines, stream banks, and relevant habitats were visually and aurally (listening to diagnostic vocalizations) scanned for signs of breeding activities (including egg masses, larval toads, adults, and adult advertisement calls) and for potentially suitable breeding habitat.

Potentially suitable habitat was assessed using the Primary Constituent Elements for habitat as defined by the USFWS and listed in the species description above. Areas matching these criteria were mapped as potentially suitable habitat using global positioning system (GPS)-enabled tablets with high resolution aerial photographs. All toad breeding locations observed were documented using the same tablets. Photographs were taken of each site and associated habitat, and, where possible, photographs of Yosemite toads at all life stages. For parity with relevant data in the CDFW High Mountain Lakes—Amphibian and Reptile Visual Encounter Sheet (CDFW, 2022) and per the potentially relevant habitat elements identified during our literature review, a data dictionary loaded onto a tablet device was utilized to collect observed habitat parameters on each of the potential toad breeding locations during the surveys. A list of the habitat parameters identified was submitted to both CDFW and USFWS for review prior to the second survey year. The subsequent potential habitat characteristics recorded during the surveys are shown in Table 4.2-2. Note that two characteristics (approximate surface area of above ground water observed and median distance from the closest three potential habitats) were calculated after the field season using Geographic Information System software.

Table 4.2-2. Potential Habitat Characteristics Recorded

Habitat Characteristic	Unit of Measurement
Approximate percentage of the pooled area with emergent vegetation growing from within (such as terrestrial grasses submerged within the pooled water)	None, 25%, 50%, 75%, or greater than 95%
Presence or absence of tree canopy cover within 16.4 feet (5 meters) of the pooled area	Presence or absence

Habitat Characteristic	Unit of Measurement
Approximate percent vegetative cover of adjacent terrestrial areas (up to 6.6 feet [2 meters] from pool edge) by herbaceous plants or woody plants less than one meter tall	Less than 5%, 25%, 50%, 75%, or greater than 95%
Approximate percent vegetative cover of adjacent terrestrial areas (up to 6.6 feet [2 meters] from pool edge) by woody plants greater than 3.3 feet (one meter) tall	Less than 5%, 25%, 50%, 75%, or greater than 95%
Dominant plant species within 6.6 feet (2 meters) of pool edge	Grasses (<i>Poaceae</i> family), shrubby willows (<i>Salix</i> species), and/or pines (<i>Pinus</i> species)
Presence or absence of wildlife burrows within 6.6 feet (2 meters) of pool edge	Presence or absence
Presence or absence of accumulated aquatic detritus within the pooled area	Presence or absence
Water flow into the pooled area	Lentic (still), or Lotic (flowing)
Deepest water depth of the pooled area	Centimeters up to 30
Approximate percentage of pooled area less than 12 inches (30 centimeters) deep	None, 25%, 50%, 75%, or 100%
Life stage of any Sierran tree frog (<i>Pseudacris sierra</i>) observed	None, tadpole, or adult
Life stage of any toad (<i>Anaxyrus</i> sp.) observed	None, tadpole, or adult
Species of any other aquatic or semi-aquatic vertebrate observed	Brook trout (<i>Salvelinus fontinalis</i>), and/or mountain garter snake (<i>Thamnophis elegans elegans</i>)
Approximate surface area of the above ground water observed	Square meters
Median distance from the closest three potential habitats	Meters

For consistency in data collection, surveys were conducted by the same four qualified biologists: Steve Norton, Jason Berkley, Jonathan Aguayo, and Sarah Berryman. To further standardize data collection, field surveys were scheduled so the biologists were rotated and paired with the previous week's surveyor.

4.3. ACOUSTIC RECORDING SURVEYS

Six acoustic recording devices were deployed in potential toad breeding habitat across the study area during the 2023 survey season (July through October). The devices were Song Meter Micro units manufactured by Wildlife Acoustics and were programmed to record 5 consecutive minutes every hour. The devices were deployed as access became available (snow melted and water began pooling) and, where possible, deployment at each location was staggered to record during the peak breeding period anticipated at that location. Ten locations were ultimately sampled. The devices were affixed to vegetation adjacent to either known or high-potential toad breeding locations: four of the locations were along Lee Vining Creek, three of the locations were around Tioga Lake, two of the

locations were around Saddlebag Lake, and one of the locations was in a meadow south of Saddlebag Lake between approximately 1,410 to 1,475 feet amsl (430 to 450 meters). Memory card status and battery life was checked and maintained throughout the 2023 field season. The deployment dates are listed in Attachment B. Locations of the acoustic detectors are shown on Figure 5.4-1.

The recordings collected were downloaded at the end of the season and processed to isolate and identify any Yosemite toad breeding calls recorded. A sample of 270 recordings known to have contain multiple Yosemite toad breeding calls were manually vetted by Biologist Steve Norton, which included visually inspecting sonograms of the recordings and listening to relevant portions of the recordings. Mr. Norton then adjusted the settings in the cluster analysis tool part of Wildlife Acoustic's Kaleidoscope software to isolate potential Yosemite toad breeding calls. After a detailed refinement of the settings to sufficiently isolate calls within the vetted 270 recordings, the remaining 8,800 recordings were run through the cluster analysis tool. The isolated files were then manually vetted and the number of verified Yosemite toad calls were tabulated.

4.4. DNA SAMPLING

In collaboration with the National Park Service, samples suitable for DNA analysis were obtained from two populations of toad within the study area were collected on August 8, 2023 (Attachment C). The two populations sampled were located at the pool south of Saddlebag Lake (approximately 295.3 feet (90 meters) east of Saddlebag Campground) and at the meadow complex immediately below the intersection of Slate Creek and Lee Vining Creek in the upper Lee Vining Creek region. Table 4.4-1 shows the location and type of sample collected by Yosemite National Park.

Table 4.4-1. Genetic Sampling of Toad within Study Area

General Sampling Region	Latitude	Longitude	Elevation	No. of Individuals Observed During Sampling	No. of Samples Collected
South of Saddlebag Lake	37.96511	-119.26891	10,079 feet amsl	200–300 tadpoles	10 tadpoles
Upper Lee Vining Creek	37.95694	-119.27389	9,850 feet amsl	200–250 tadpoles	10 tadpoles

amsl = above mean sea level

The samples collected will ultimately be compared against a hybrid genetic panel of Yosemite toad and western toad (*Anaxyrus boreas*) currently being developed by the Eldorado National Forest.

5.0 RESULTS

5.1. LITERATURE REVIEW RESULTS

In preparation for the species review, field techniques, and methods, over 50 research papers were reviewed and, of those, 23 papers were evaluated and utilized in various

capacities to govern the work accomplished in this report. CDFW and the USFS were invaluable sources of many of these papers. The key categories and related insights from the literature review are discussed below.

5.1.1. ECOLOGY AND HABITAT

Yosemite toads breed in both permanent and ephemeral water habitats, adults and subadults are terrestrial after the breeding period, and tadpoles transform and disperse in one season (Brown et al., 2013). During a study by Brown et al. (2013), only a few animals moved among meadows for breeding, suggesting that Yosemite toads have high site fidelity at the scale of individual meadows. Yosemite toads were described as, “explosive breeders with rapidly maturing larvae” by Fellers et al. (2015). Yosemite toads were generally found to avoid the larger lakes by Fellers et al. (2015). Fellers et al. (2015) also found that elevation had the largest positive effect for Yosemite toad (i.e., occurrence increased in elevation). Maximum water depth showed a negative effect for Yosemite toad (i.e., occurrence decreased as water depth increased). They were also more likely to occupy sites with shallower waters/wetlands but tended to occupy wetlands with longer shore lengths. During a study by Roche et al. (2012), occupancy was evenly split between lentic (nonflowing) and lotic (flowing) pools in 2006 and 2008. However, only lentic pools were occupied during the dry, short breeding season of 2007 when the majority of pools were lentic. Berlow et al. (2013) considered the distribution of Yosemite toad breeding habitat to be a network of discrete meadow patches linked by dispersal.

Liang (2013) found that the maximum distance traveled by the Yosemite toad from upland to breeding meadows was greater for females (4137 feet [1,261 meters]) than for males (2839 feet [865 meters]), the mean distance traveled by females was twice as great as by males, and the average home range was more than 1.5 times as large for females than for males, but the difference in the latter was not significant. There were no significant differences between toads from different meadows for mean distance traveled, mean maximum distance traveled, or home range. “Herbaceous, shrub, and tree species from 20 different families were identified. Locations where toads were present generally had more herbaceous plants such as *Lupinus* and *Lotus* species but included fewer woody plants and had less canopy cover. Locations without toads generally had more trees and shrubs such as red fir (*Abies magnifica*), white fir (*Abies concolor*), and bush chinquapin (*Chrysolepis sempervirens*). Woody species were found in the ground layer as well as the understory and overstory in locations without toads but not in locations with toads” Liang (2013).

Liang (2013) also discovered that adult Yosemite toads exhibited strong site fidelity to aquatic breeding sites, site fidelity to micro cover sites, and site fidelity to upland sites. They stressed the importance of the terrestrial habitat due to the amount of time spent in the uplands, and most long-distance movement occurring just days after breeding concluded. The study found that toads primarily inhabit burrows, both shallow ones where they are visible and deeper ones where they are hidden. Additionally, they were found under various types of cover like logs, rocks, and tree stumps. The choice of microsite cover appears to be opportunistic, likely influenced by availability. Open areas typically exhibited a greater percentage of herbaceous species in the ground layer, particularly

those that thrive in full sun such as *Lupinus* and *Lotus* species. These plants attract insects like ants and bees, potentially enhancing food resources compared to areas with fewer herbaceous plants (Liang, 2013). Highly suitable consistent-site habitats are characterized by several factors: low slopes; specific vegetation types such as wet meadow, alpine-dwarf shrub, montane chaparral, red fir, and subalpine conifer; as well as warm temperatures. Additionally, these habitats have low aspect-classes and experience precipitation ranging from approximately 20 to 32 inches (500 to 800 millimeters) during the coldest quarter. Moreover, they exhibit a mean diurnal temperature range between approximately 48 to 59°F (Liang and Stohlgren, 2011). At Tioga Pass, the edges of talus slopes seem to be favorable for summering female toads as they tend to cluster there. This could be because talus slopes act as barriers to further dispersal. Toads migrate to "high-quality" summer habitats characterized by higher vegetation diversity and abundant food resources. The use of widely disconnected habitat patches may be a common behavior among toads in high altitude environments (Morton and Pereyra, 2010).

In research of Yosemite toad habitat (especially upland, non-breeding habitat), western toad research was used to further understand the demarcation and potential overlap in habitat usage with the Yosemite toad. Survival probability of western toads in Colorado was found to be influenced by minimum daily winter air temperature, snow depth, and winter environmental moisture level (Scherer et al., 2008), suggesting that the suitable sites available for western toad hibernation may be limiting at the northern edge of the species' range and at high elevations (Browne and Paszkowski, 2010). In the Yukon, the species has only been reported from valleys that receive high snowfall, which prevents deep frost penetration (Cook, 1977). Western toads were hypothesized to select conifer forests for hibernation because of differences in frost depth and availability of suitable microhabitats (e.g., tunnels). Balland et al. (2006) compared winter frost depth among Jack pine (*Pinus banksiana*), black spruce (*Picea mariana*), and aspen (*Populus* sp.) stands in central Saskatchewan and showed that frost penetrated the least in black spruce stands. Peat hummocks, squirrel tunnels, and cavities under spruce trees (the structures used by 71 percent of toads at pasture) were associated with conifer forests. Dry shrubland was the other landcover type that was selected more frequently than deciduous forest at pasture. Western toads were found to hibernate in a variety of natural landcover types but did not hibernate in any human-altered landcover types (e.g., agricultural fields, forestry cut-blocks, residential yards, and roadsides).

5.1.2. PHYSIOLOGY AND GENETICS

A morphological difference of interest between Yosemite toad and western toad (two morphologically similar species) includes the parotoid glands. Karlstrom (1973) states "the round to subovate parotoid glands are usually broader and lower than those of [western toad] and often merge with smaller warts. Inter-parotoid distance is narrow, approximately the width of the gland."

Grasso et al. (2010) determined, in a joint field and laboratory study, that Yosemite toad was not palatable to brook trout as eggs, tadpoles, or recently metamorphosed toads and stated that Yosemite toads, "like most other bufonids, likely possess toxic properties

throughout their aquatic and terrestrial life histories, rendering them unpalatable to trout. Flier et al. (1980) found that a class of cardiac glycosides (bufadienolides) in the skin may be responsible for unpalatable properties in toads.” In a study by Fellers et al. (2015), Yosemite toads were more commonly found in shallow high-elevation ponds and their occurrence was minimally affected by the presence of fish.

Western toads occur in Yosemite Valley (3,937 feet [1,200 meters]), but only one individual was located during the 38 surveys conducted by Fellers et al. (2015) in Yosemite Valley over the last 19 years. The population dynamics and structure of Yosemite toads remain unclear. Although currently recognized as one taxonomic unit, genetic data suggest the possibility of multiple discrete lineages within what is presently classified as Yosemite toads. Additionally, the relationship between Yosemite toads and their closest relatives is ambiguous and requires further clarification (USFWS, 2014). Goebel et al. (2008) extrapolated further information on the divergence of the western toad species group and its three major clades. They found support for the hypothesis of Pleistocene divergence and suggest that the phylogeographic history of the group was heavily influenced by dynamic Pleistocene glacial and climatic changes, and especially pluvial changes, in western North America. They also found a paraphyletic split between the northwest and southwest haplotype groups of Yosemite toad. Hybrids of Yosemite toad and western toad were identified by collectors at the northern end of the range of Yosemite toad in the Goebel study (2008). Hybridization studies produced F2 hybrids of Yosemite toad and western toad in the laboratory (Blair, 1972), but the collection localities of these specimens were not identified by Blair (1972) so their correlation with mitochondrial DNA studies is not clear.

5.1.3. FIELD TECHNIQUES

Brown et al. (2013) postulated that because basic abundance counts are seasonally dependent for Yosemite toad and due to which obtaining demographic information (e.g., abundance, survival) at large scales is logistically impractical, occupancy can be used as a relatively affordable metric to evaluate distributional changes bioregionally and more detailed demographic information can be collected at a smaller subset of locations. They visited a subset of watersheds every year and the remaining watersheds were to be visited once every 5 years on a rotating schedule. Visual encounter surveys were conducted in all lentic sites (lakes, meadows) and a sample of stream sites, and detection and count data were recorded. In a more intensive design component for Yosemite toad, they conducted capture-mark-recapture surveys for adult breeding males using the “Robust Design” and egg mass counts in six meadows in two watersheds during spring breeding. Yosemite toad had the most variable detectability, both for any life stage and at sites with reproductive stages according to Fellers et al. (2015).

Liang et al. (2012) observed that Yosemite toad occupancy of suitable breeding habitat varies: not all pools were occupied and not all potential pools were unoccupied. Of the parameters collected during their study (water temperature, depth, detritus depth, canopy cover, and live vegetation height), predictors of toad occupancy were found to be mean water depth, temperature, and surface water amount. Occupied pools tended to be deeper, warmer, and had more surface water compared to unoccupied ones. These

conditions likely facilitate quicker developmental times in shallow water ephemeral habitats available in spring and summer. Despite generally shallow breeding pools, toads appear to choose slightly deeper pools relative to other years. Breeding pools were very shallow water bodies (mean depth 1.7 inches [4.4 centimeters] for occupied pools), and differences in depth between pools that are occupied and unoccupied each year are small but notable (Liang et al., 2017).

5.1.4. ABIOTIC FACTORS

As mentioned in the species description, there are several abiotic factors that have been hypothesized to negatively affect the Yosemite toad, and other special-status amphibians. Bradford et al. (1993) studied water chemistry and the effect on Yosemite toads and found it did not differ between sites containing the species and sites lacking the species in a manner consistent with the acidic deposition hypothesis. Adams et al. (2005) found that ambient ultraviolet B light did not have a negative association on presence of western toad and Cascades frog (*Rana cascadae*) in ponds studied in the field. However, ultraviolet B light levels in tandem with a variety of stressors could affect amphibian populations.

Liang and Stohlgren (2011) noted that Yosemite toad “does not have a simple relationship with the environment and is found within a range of environmental conditions.” Consistent distribution of occupied sites is influenced by topographic and bioclimatic factors and includes tolerance of a broad range of temperature and precipitation gradients.

Roche et al (2012) found that only water depth, temperature, and total nitrogen content were significant predictors of toad occupancy of potential breeding pools over the 3-year study. Toad occupancy rate increased with water temperature and total nitrogen concentration and decreased with water depth.

5.2. HABITAT PARAMETERS OBSERVED

5.2.1. AVAILABLE UPLAND HABITAT

The vast majority of the study area contains upland habitat elements known to support Yosemite toads, as identified in the Primary Constituent Elements for the species by the USFWS. Specifically, suitable upland habitat is considered areas up to 0.78 mile (1.26 kilometers) away from breeding habitat (not separated by dispersal barriers, such as heavily used roadways), that that provide:

- Sufficient cover (including rodent burrows, logs, rocks, and other surface objects) to provide summer refugia;
- Foraging habitat;
- Adequate prey resources;
- Physical structure for predator avoidance;

- Overwintering refugia for juvenile and adult Yosemite toads;
- Dispersal corridors between aquatic breeding habitats;
- Dispersal corridors between breeding habitats and areas of suitable summer and winter refugia and foraging habitat; and/or
- The natural hydrologic regime of aquatic habitats.

Because of the abundance of suitable upland habitat, the study effort focused on the availability of potential breeding habitat.

5.2.2. AVAILABLE BREEDING HABITAT

Based on observations made during the 2022 field season, 49 potential breeding locations were identified for additional surveys (Figure 5.4-1). The habitat structure of these different locations were varied to sufficiently sample all potential toad breeding locations. The data table in Attachment D shows the variables collected for each of the potential habitat locations. No consistent patterns between occupied and unoccupied habitat were observed or recorded.

5.2.2.1. Northern Saddlebag Lake

All of the potential breeding locations within the Northern Saddlebag Lake region were fed water by off-site sources (including snowmelt or overflow from adjacent streams that ultimately flow into the FERC Project Boundary). Only two potential breeding locations were observed within the FERC Project Boundary, and both were fed water through sheet flow originating from snowmelt along the slopes north of Saddlebag Lake. Of the remaining locations, the largest meadow and pool complex was fed water from two sources: Greenstone Lake and snowmelt from the north-facing slopes along the western side of Saddlebag Lake. This complex has diverse hydrologic features (including shallow, grassy meadows; deep, still pools; and narrow, flowing streams of varying depths) and was documented in CDFW's CNDDB as previously supporting Yosemite toad breeding. Other potentially suitable habitat in this region includes two isolated, shallow pools fed by Greenstone Lake and off-site snowmelt, and the shallow margins of a deep pool above Greenstone Lake.

The reduced water levels of Saddlebag Lake in 2022 exposed large portions of ground which was surveyed during the 2022 field season. Despite this additionally exposed area, no additional shallow pooling was observed.

5.2.2.2. South of Saddlebag Lake

There are five potential or known breeding locations in the south of Saddlebag Lake region. All these locations are outside of the FERC Project Boundary and fed water from off-site snowmelt unassociated with the Project. The first two are pools approximately 50 feet (15 meters) apart and are both located above Saddlebag Lake to the south, approximately 295 feet (90 meters) east of Saddlebag Campground. The shallower of

these two pools is known to support a population of Yosemite toads. The third potential breeding location is a pooled meadow approximately 1,150 feet (350 meters) south of the first two pools discussed at this location and is the nearest potential breeding location to these pools. This meadow is located on a southwest-facing slope. The remaining two potential breeding locations are within the Sawmill Campground facilities. These locations consist of a large pool within the Sawmill Campground and a small meadow located south of the trail into the Sawmill Campground.

5.2.2.3. Upper Lee Vining Creek

The large, elevated meadow complex is fed water by snowmelt from the northeast-facing slopes to the west. A small, meandering drainage feature runs through the meadow complex ultimately draining into Lee Vining Creek to the east. Potential breeding habitat is generally concentrated along this drainage. Several shallow pools (generally less than 4 inches [10 centimeters] deep) occur along the edges of the drainage feature. Further, there are isolated oxbows and shallow bars within the drainage feature that also provided potential breeding habitat.

5.2.2.4. Lower Lee Vining Creek

The floodplain adjacent to Lee Vining Creek supported a high concentration of isolated pools with a wide diversity of habitat parameters (sizes, depths, etc.). The inflow to the different pools varied as some are fed water by off-site snowmelt associated the adjacent slopes and valleys, while some are fed water by overflow from Lee Vining Creek. During the survey effort, many of the pools thought to be fed by off-site snowmelt dried almost completely on cloudy days with air temperatures at or near freezing, while others thought to be fed by Lee Vining Creek (either through surface or subsurface flow) continued to have pooled water.

5.2.2.5. Tioga Lake

Tioga Lake is fed water by several sources. Perennial water flow enters the lake from the south (draining Tioga Pass) and from the southeast (draining the Dana Lake area). Additional inflow includes runoff from the adjacent slopes to the east and west; however, considerably less water enters the lake from these sources. Potentially suitable breeding habitat along the margins of Tioga Lake was generally concentrated around these inflow areas. The wet meadows associated with the smaller eastern and western inflows supported some temporary, potentially suitable breeding habitat. The water flow originating from Tioga Pass was more channelized and did not create meadow habitat along the Tioga Lake margins; however, topography approximately 131 feet (40 meters) upstream of Tioga Lake supported a meadow with potential breeding habitat. Water flow draining the Dana Lake area was also substantial and mostly channelized; however, the topography along the Tioga Lake margins fans out and supports a wide, shallow meadow area fed by channel overflow and partially supported by peak water levels within Tioga Lake. This area is also potential breeding habitat.

5.3. VISUAL ENCOUNTER SURVEYS

5.3.1. NORTHERN SADDLEBAG LAKE

No toads were observed anywhere within the Northern Saddlebag Lake region during either the 2022 or 2023 field seasons. See Figure A-4-1, Pools 1 to 9 in Attachment A.

5.3.2. SOUTH OF SADDLEBAG LAKE

In the western pool located south of Saddlebag Lake, all four life stages of Yosemite toads (eggs, tadpoles, subadults, and adults) were observed during both the 2022 and the 2023 field seasons (Pool 11: Figure A-4_2 in Attachment A). No evidence of toad breeding was observed in the second pool (located approximately 50 feet [15 meters] east of the occupied pool) despite adult toads being observed adjacent to the pool (Pool 12: Figure A-4_2 in Attachment A). No sign of toad or toad breeding was observed in any of the other potential breeding locations including the locations at Sawmill Campground and the location 1,150 feet (350 meters) south of the other pools (see Figure A-4-2 in Attachment A).

5.3.3. UPPER LEE VINING CREEK

Portions of upper Lee Vining Creek draining the Slate Creek Meadow Complex below Slate Creek were observed supporting toad tadpoles (Pools 16, 18, and 19; see Figure A-4-2 in Attachment A). This area was not surveyed in 2022 and was inaccessible during the early part of the 2023 survey season due to extraordinarily high-water flow in Lee Vining Creek. Regardless, high numbers of toad tadpoles were observed in multiple locations (Pools 16, 18, and 19). The tadpoles were generally located in very shallow water edges (1 inch [3 centimeters] or less) along the flowing drainage or within adjacent meadows supporting very shallow water. Some tadpoles were observed in the flowing water channel downstream closer to the intersection with Lee Vining Creek; however, these individuals were larger and were assumed to have washed down with high-water flows rather than hatching within the water channel.

5.3.4. LOWER LEE VINING CREEK

No toads were observed anywhere within the Lower Lee Vining Creek region during the 2023 field season even though the ponds retained water through the season (Pools 23 to 26, 28 to 32, 34 to 43, and 60 to 62: Figure A-4-3 in Attachment A). During the 2022 surveys, two pools contained recently hatched tadpoles that could be identified as either treefrog or toad (Pools 31 and 63). A follow-up visit was conducted at these pools to intentionally coincide with tadpole metamorphosis; however, both pools had dried completely and there was no remnant evidence of any amphibians. No other observation of tadpoles or toads were made during any of the other survey visits. Many of the pools along Lower Lee Vining Creek were observed to support Sierran treefrogs during both the 2022 and 2023 survey seasons.

5.3.5. TIOGA LAKE

No toads were observed anywhere within the wet meadows associated with the small inflows along the eastern or western margins of Tioga Lake. However, A portion of the overflow meadow associated with the larger inflow draining the Dana Plateau was observed to support toad breeding during the 2022 and 2023 field seasons (Pool 47; see Figure A-4-4 in Attachment A). The observations included hearing mating calls and seeing adults, eggs, and tadpoles.⁴

The pool (Pool 50: Figure A-4-4 in Attachment A) above Tioga Lake to the south was also determined to have potential breeding habitat but was outside of the FERC Project Boundary and was not regularly included in the visual encounter surveys. No toad breeding was visually observed at this location, during the two visits of the 2022 season and the one visit during the 2023 season. However, toad breeding was detected at this location using the audio recorders (details are provided in the Acoustic Surveys section below).

5.4. ACOUSTIC SURVEYS

Acoustic recording devices were deployed in potential toad breeding habitat in the 2023 survey season (July through October). Of the 10 locations deployed, only 2 audio recorder locations detected Yosemite toad breeding calls. Figure 5.4-1 shows the number of separate call events recorded throughout the period sampled daily at the two separate locations. Note, the number of separate call events shown on Figure 5.4-1 include instances of overlapping calls by different males simultaneously listed as one separate call.

⁴ Portions of CDFW's 2022 herpetological surveys overlapped with the Project's 2022 Yosemite toad survey effort. The staggered timing of the Project's survey efforts and CDFW's survey efforts (albeit closely staggered) allowed each survey effort to make observations not shared by both parties. Notably, CDFW observed Yosemite toad tadpoles in some pools above the southern margins of Tioga Lake.

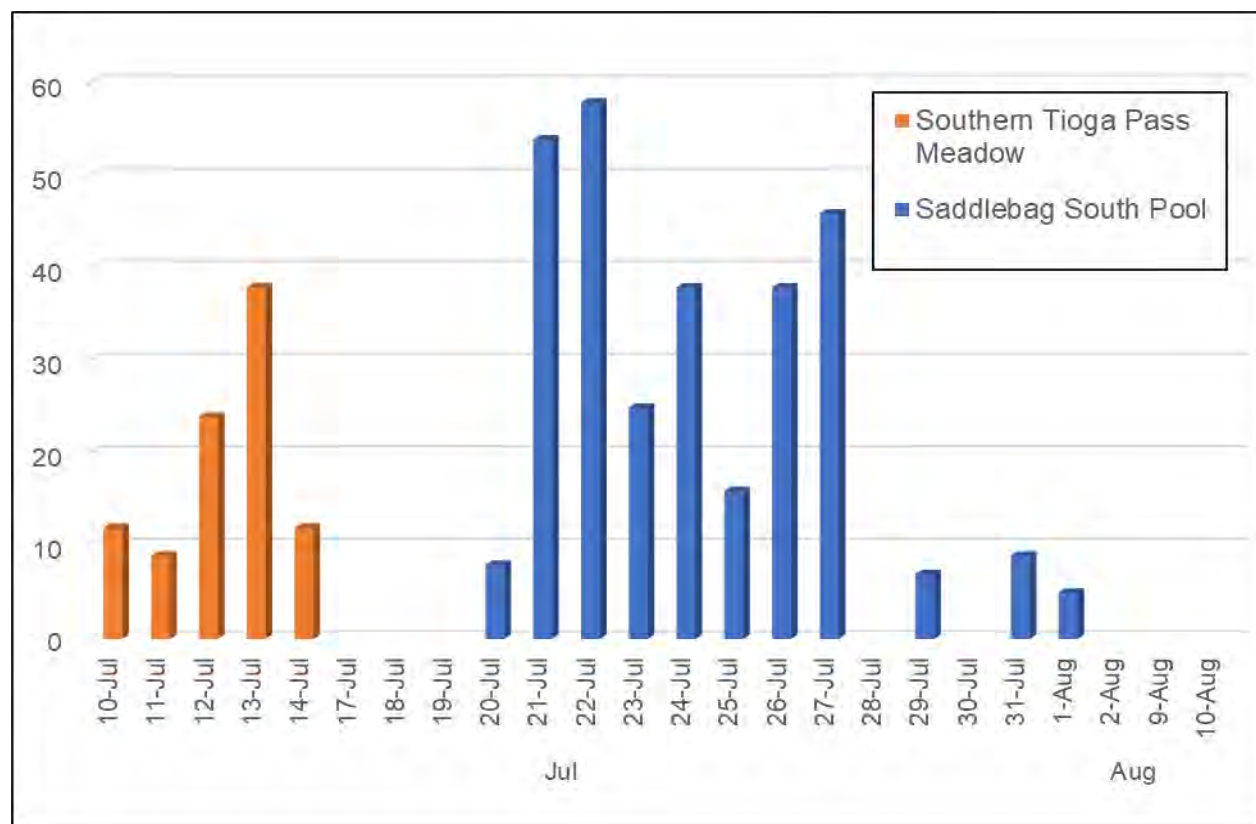


Figure 5.4-1. Yosemite Toad Breeding Calls Recorded Daily.

The audio recorders were determined to have a recordable range between approximately 50 to 100 feet (15 to 30 meters). This range was not systematically tested but all calls at or greater than 100 feet (30 meters) away were subsequently determined to be out of range of the recorders. Figure A-4 in Attachment A shows the location of the audio recorders in relation to the potential breeding habitat observed.

5.4.1. NORTHERN SADDLEBAG LAKE

Despite successful audio recorder deployment, no Yosemite toad breeding calls were recorded in the Northern Saddlebag Lake region (Pools 1 to 9: Figure A-4-1 in Attachment A). Only one detector was deployed in this area; however, it was in the center of the meadow complex within the Greenstone Lake outflow to Saddlebag Lake and the majority of potential breeding habitat in that meadow was within approximately 100 feet (30 meters) of the detector. None of the other potential breeding locations were recorded.

5.4.2. SOUTH OF SADDLEBAG LAKE

Audio recorders were deployed in one known breeding location (Pool 11: Figure A-4-1 in Attachment 1) and one potential breeding location (Pool 13: Figure A-4-1 in Attachment 1). The recorder at the known breeding location was deployed in a tree approximately 56 feet (17 meters) to the west of the pool's waterline. The eastern extent of the pool was greater than 131 feet (40 meters) away from the recorder and the total number of calls reported may underrepresent the total calls at this pool. Regardless, the number of calls

recorded at this location occurred for 8 consecutive days followed by intermittent recordings for an additional 5 days.

The second recorder was deployed at the isolated meadow (Pool 13) located approximately 1,150 feet (350 meters) south of Saddlebag Lake and no breeding calls were recorded. This meadow is less than 200 feet (60 meters) in diameter and the recorder was attached to a sapling located in the center of the meadow. Any breeding calls at this meadow are likely to have been recorded by the audio recorder if they had occurred.

5.4.3. UPPER LEE VINING CREEK

Two audio recorders were deployed within the upper Lee Vining Creek meadow complex (Western Slate Creek Meadow and Pool 16: Figure A-4-2 in Attachment A); however, access limitations prevented recorder deployment until after the anticipated Yosemite toad breeding calls would have occurred. No Yosemite toad breeding calls were recorded on either recorder within the upper Lee Vining Creek region.

5.4.4. LOWER LEE VINING CREEK

An audio recorder was deployed in two locations within the Lower Lee Vining Creek region (Central LV Creek Westside, near pools 63,29,30, 60 and 31 and central LV Creek Eastside near pools 42, 41, and 39: Figure A-4-3 in Attachment 1), with the first location only being recorded before access was available to the west side of Lee Vining Creek. There were several limitations to audio recording the potential breeding habitat along this portion of Lee Vining Creek. First, the potential breeding habitat is dispersed across a wide area and sufficient coverage of all potential habitat would be a substantial effort. Second, the ambient noise from the high-water flows of Lee Vining Creek substantially reduces the distance clear recordings can be collected by the equipment. Third, this area is heavily used for recreation (specifically fishing) and there is limited vegetation to secure and hide the audio recorders. Regardless, the detector along the western side of Lee Vining Creek was deployed within 100 feet (30 meters) of a pool with unidentified tadpoles during the 2022 survey. No Yosemite toad breeding calls were recorded within any portion of the Lower Lee Vining Creek region.

5.4.5. TIOGA LAKE

Three locations around Tioga Lake had audio recorders deployed during 2023. The first recorder was deployed in the center of a meadow complex along the northwestern side of Tioga Lake (Pool 46/Western Tioga Lake Meadow: Figure A-4-4 in Attachment A). Multiple portions of the meadow complex extended beyond 100 feet (30 meters) from the acoustic recorder location; however, the majority of potential breeding habitat was within 100 feet (30 meters). No Yosemite toad breeding calls were recorded at this location. The second recorder was deployed at the meadow and small pool complex associated with inflow from the Dana Plateau (Pool 47/ Southeast Margin Tioga Lake: Figure A-4-4 in Attachment A). A portion of this meadow was observed to support breeding Yosemite toad; however, the audio recorder was greater than 165 feet (50 meters) away from the

observed breeding location. Subsequently, no Yosemite toad breeding calls were recorded by this detector. The final location was at the potential breeding habitat above Tioga Lake to the south (Pool 50/Southern Tioga Pass Meadow: Figure A-4-4 in Attachment A). The habitat was small (approximately 100 feet [30 meters] in diameter) and the audio recorder along the western boundary. This habitat was not regularly included in the visual encounter surveys and as a result, no breeding activity was observed at this location. The audio recorder recorded Yosemite toad breeding calls at this location for 5 consecutive days.

5.5. RECREATION INTERACTIONS

As part of the Existing Recreation Facilities Condition Assessment (REC-2 Study) performed for the Project, the location of dispersed recreational activities were assessed, including identifying informal pedestrian trails. The assessment included both a desktop review of aerial images and a field assessment. Of the 7,048 linear feet (2,148.2 meters) of trails identified around Saddlebag Lake and the 9,924 linear feet (3,024.8 meters) of trails around Tioga Lake, 1,129 linear feet (344 meters) of trails intersect with potential breeding habitat and 303 linear feet (92 meters) of trails intersect with the occupied breeding habitat observed. More specifically, the intersection of pedestrian trails and potential breeding habitat occurred along within the Northern Saddlebag Lake region and the intersection of pedestrian trails and occupied breeding habitat occurred in the Tioga Lake region (see Figure A-5 in Attachment A).

5.6. DNA SAMPLING

Yosemite toad are known to interbreed with western toad in multiple locations within California (personal communication, Paul Maier, Population Geneticist, Gene by Gene, January 13, 2023). The closest known hybrid location is believed to be at approximately 10,000 feet (3,048 meters) amsl, approximately 4.7 miles (7.6 kilometers) north of Saddlebag Lake (see Figure A-6 in Attachment A). Figure A-5 shows toad occurrence records compiled from multiple sources, including Yosemite toad records in CNDDDB (CDFW, 2020), western toad records from iNaturalist (iNaturalist, 2022), the western toad and Yosemite toad museum records in Tioga Pass along the Tuolumne County and Mono County border (MVZ Arctos Database, 2021), and anecdotal records of the Yosemite toad–western toad hybrid population in the Blue Lake area (personal communication, Paul Maier, Population Geneticist, Gene by Gene, January 13, 2023). To date, no genetic analysis of any of toad populations within the study area has been performed.

The DNA samples collected in 2023 at the two sites within the study area are scheduled to be processed and compared against a hybrid genetic panel currently being developed by the Eldorado National Forest. Because the sample processing and analysis are in progress, no results are yet available.

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ATTACHMENT A FIGURES



FERC Project Boundary (P-1388)

Penstock

Tunnel

Gages

Inyo National Forest

Wilderness Area (Inyo NF)

Yosemite National Park

Inyo NF Trail

County Line

Inyo NF Recreation Site

Boating - Non-Motorized

Campground Camping

Group Camping

RV Camping

Day Hiking

Interpretive Area

Fishing Access

Picnicking

Viewing Scenery

Visitor Center

SOUTHERN CALIFORNIA

EDISON

Energy for What's AheadSM

Figure A-1

Project Location

LEE VINING

HYDROELECTRIC

RELICENSING PROJECT

N

Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet

Projection: Lambert Conformal Conic

Datum: North American 1983c

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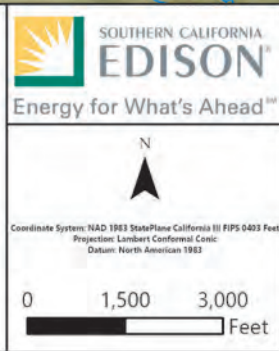
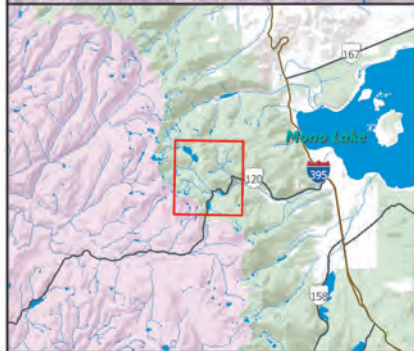
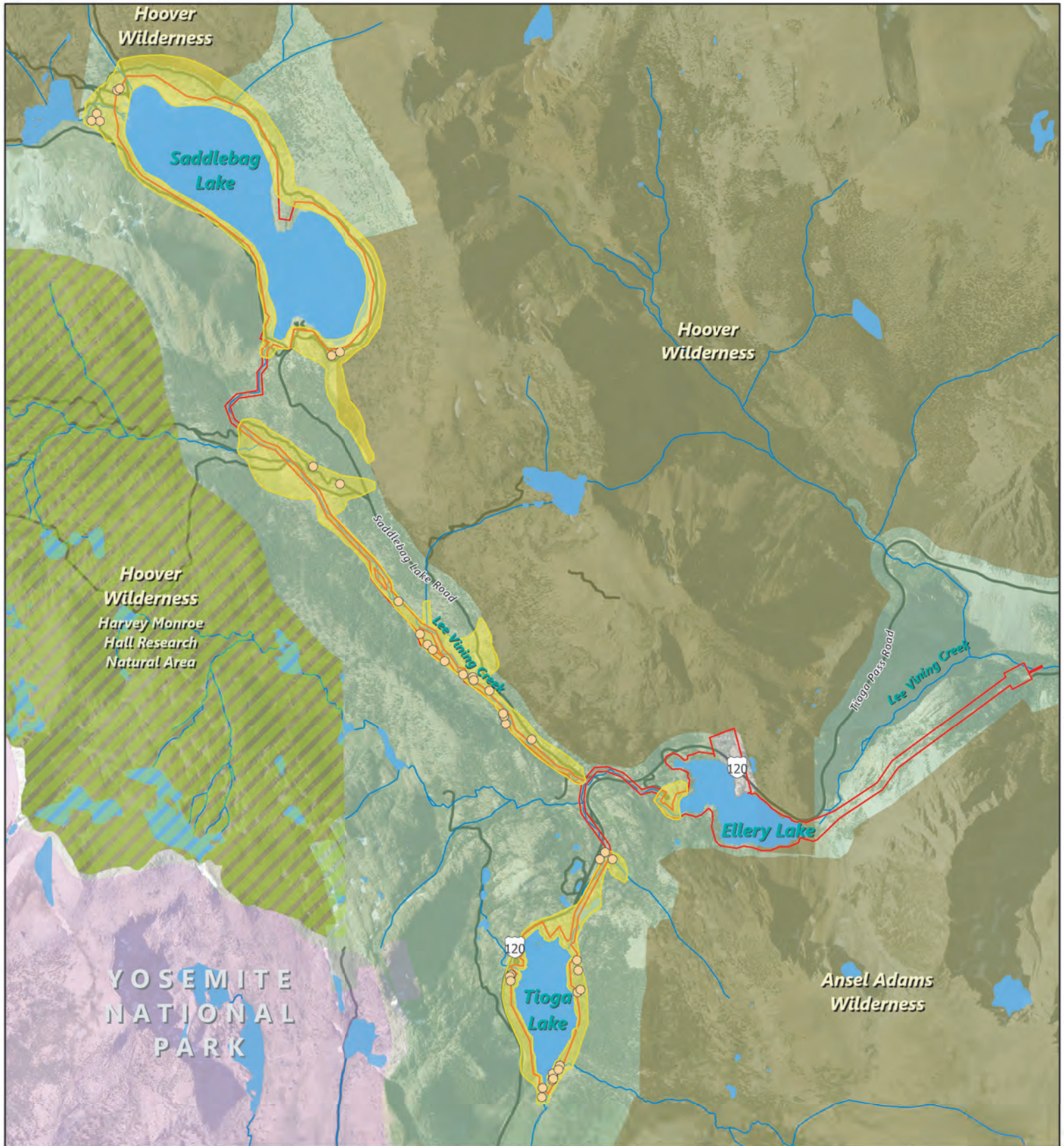
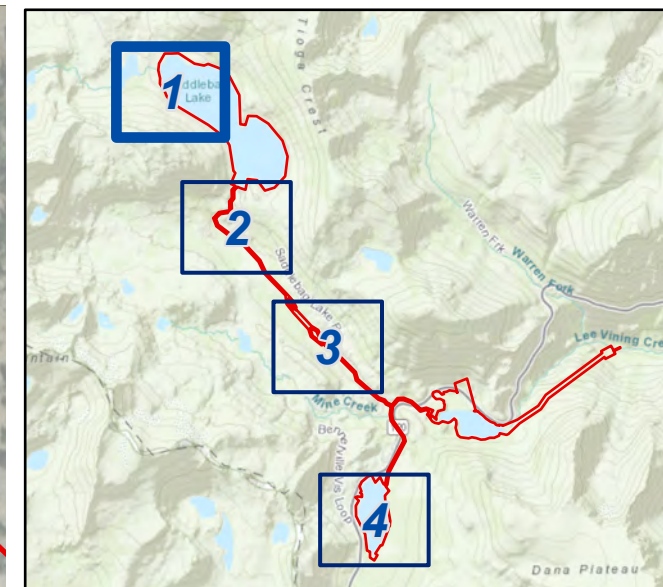
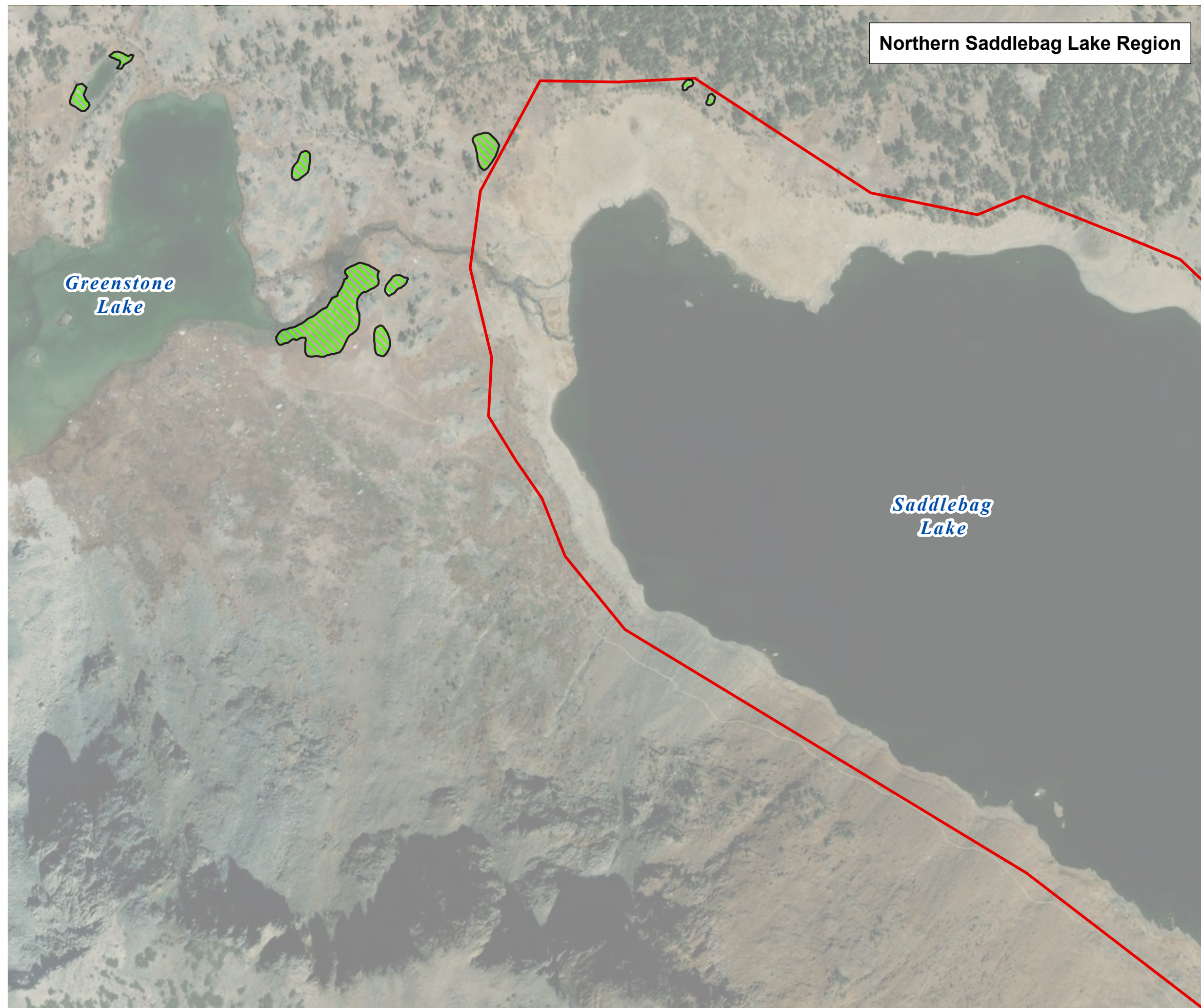


Figure A-2

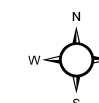
**2022
Yosemite Toad
Habitat
Study Area**

**LEE VINING
HYDROELECTRIC
RELICENSING PROJECT**

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- FERC Project Boundary
- YOTO Occupied Potential Habitat**
- Potential Breeding Habitat Observed



400 200 0 400 Feet

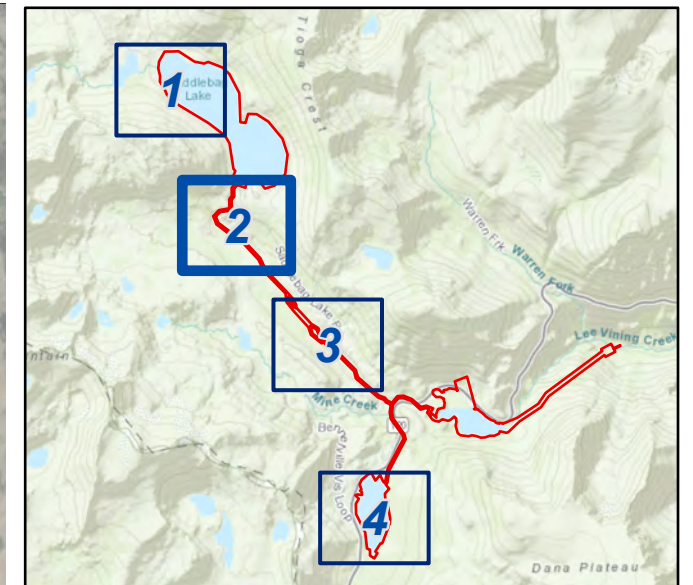
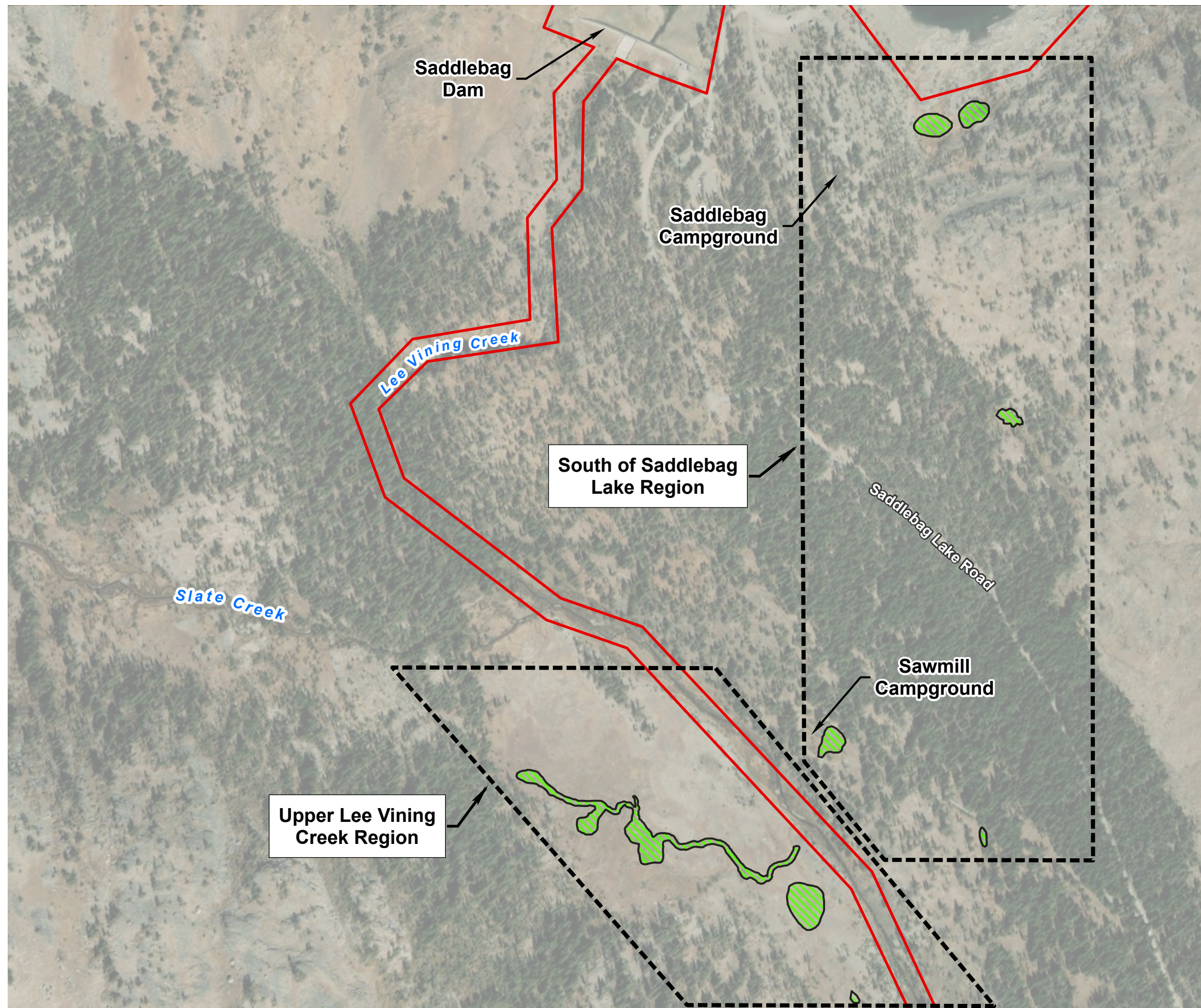
Aerial Source: ESRI, Maxar 2022

Prioritized Yosemite
Toad Study Area **Figure A-3-1**
Lee Vining Hydroelectric
Relicensing Project

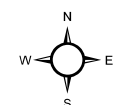


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-  FERC Project Boundary
- YOTO Occupied Potential Habitat**
-  Potential Breeding Habitat Observed



400 200 0 400 Feet

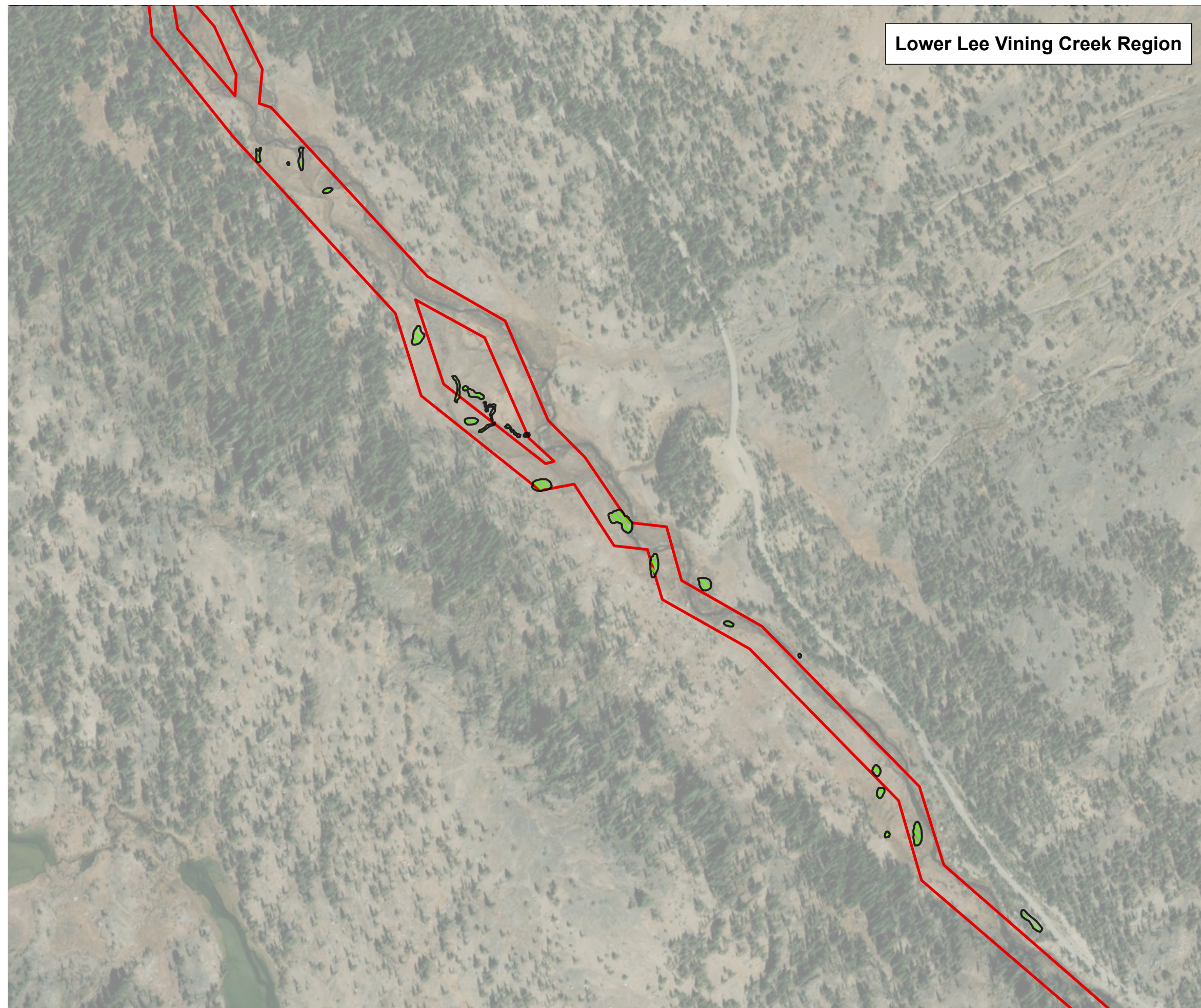
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Prioritized Yosemite Toad Study Area **Figure A-3-2**
Lee Vining Hydroelectric Relicensing Project

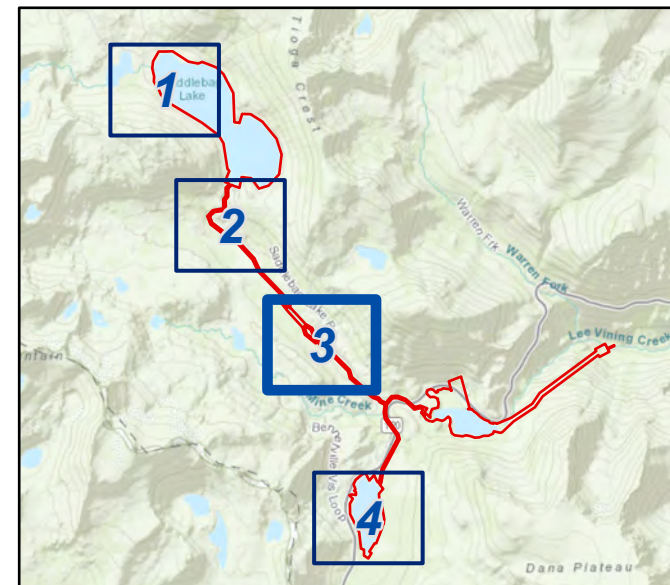


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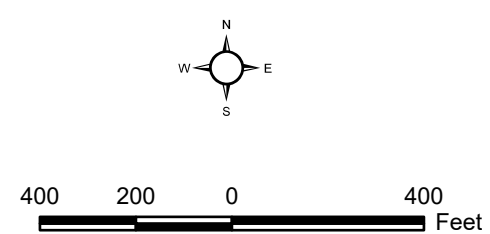
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Lower Lee Vining Creek Region



- FERC Project Boundary
- YOTO Occupied Potential Habitat**
- Potential Breeding Habitat Observed



Aerial Source: ESRI, Maxar 2022

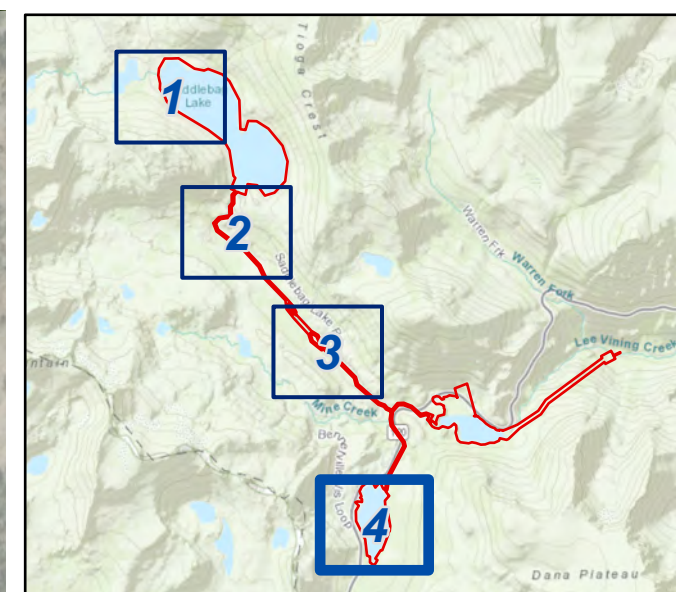
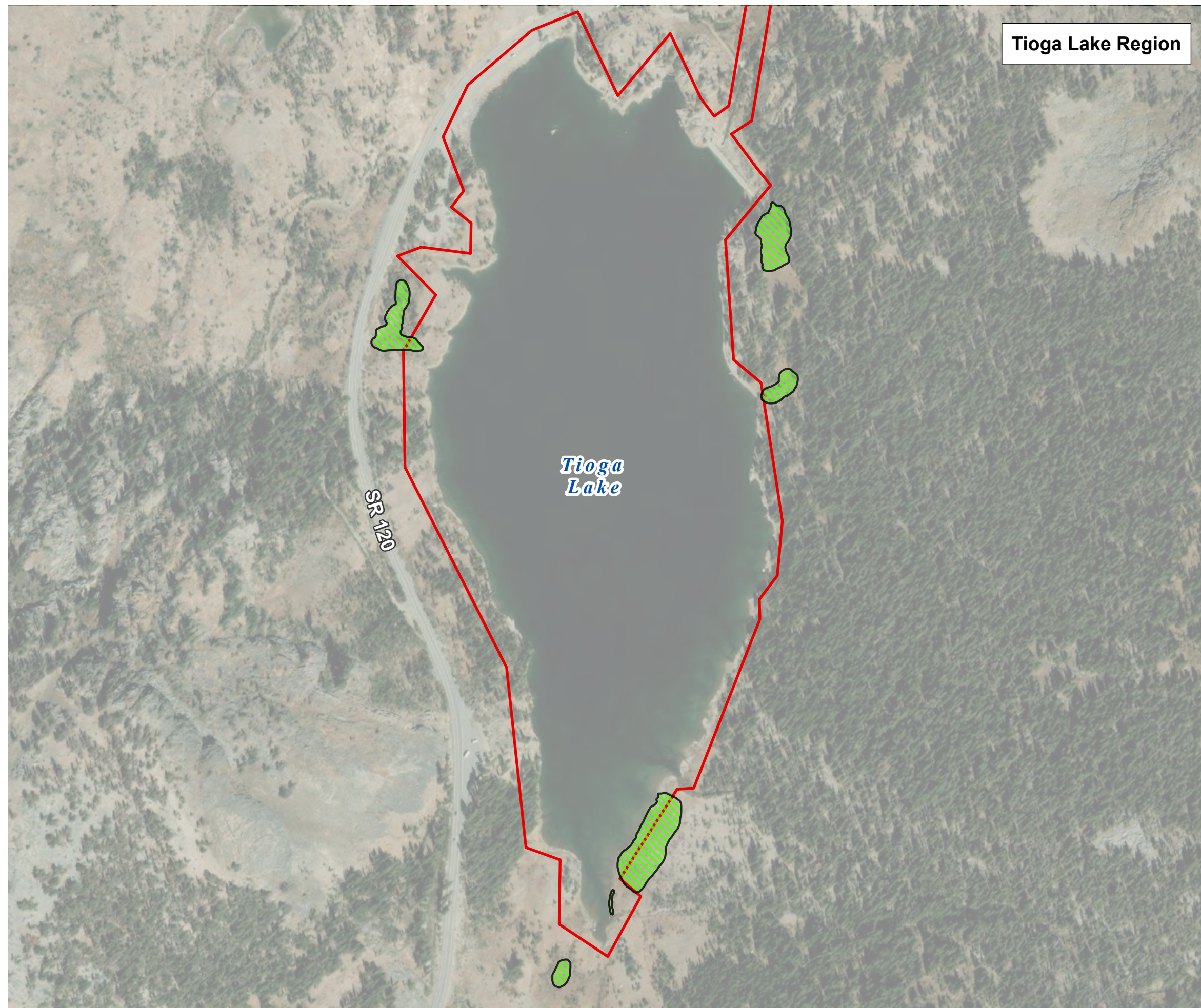
Prioritized Yosemite Toad Study Area **Figure A-3-3**

Lee Vining Hydroelectric Relicensing Project

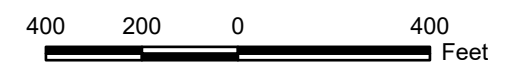
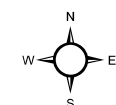
SOUTHERN CALIFORNIA
EDISON
Energy for What's Ahead

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- FERC Project Boundary
- YOTO Occupied Potential Habitat**
- Potential Breeding Habitat Observed



Aerial Source: ESRI, Maxar 2022

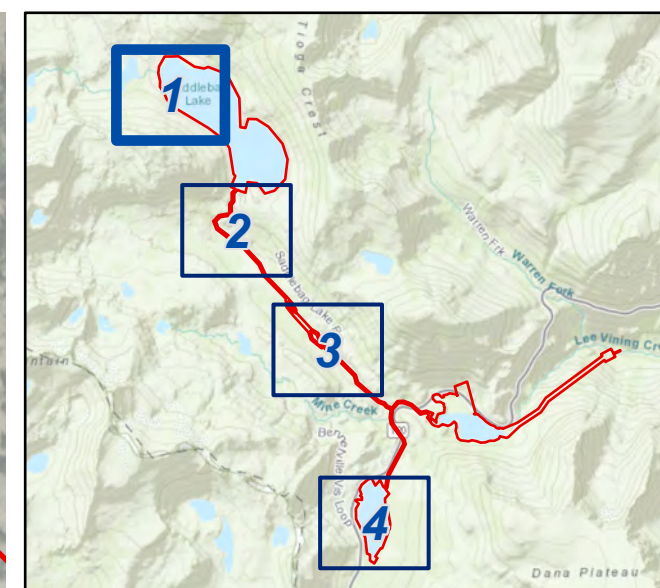
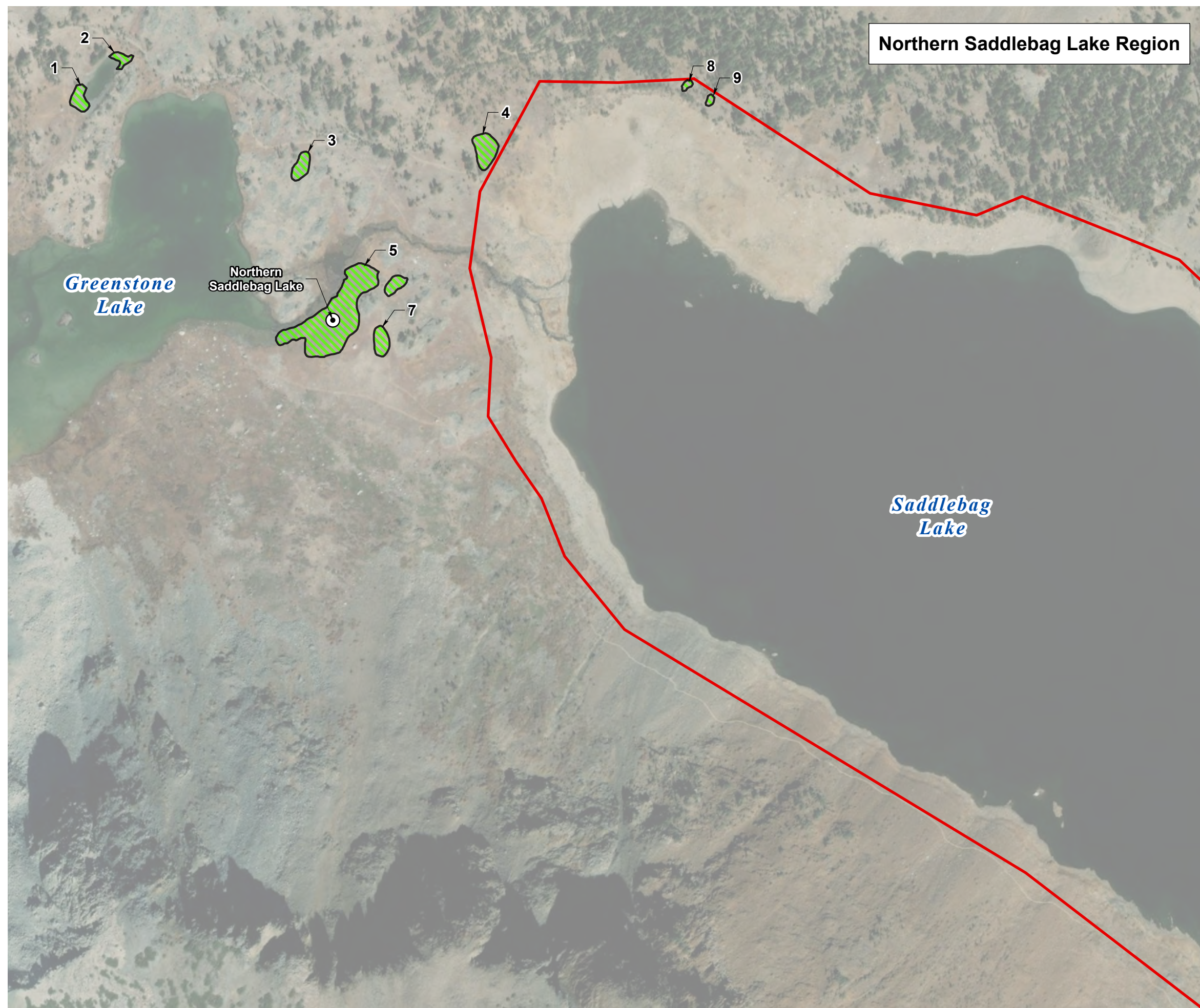
Prioritized Yosemite Toad Study Area **Figure A-3-4**

Lee Vining Hydroelectric Relicensing Project

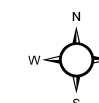
SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead

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- FERC Project Boundary
- Acoustic Detector
- YOTO Occupied Potential Habitat**
- Potential Breeding Habitat Observed



400 200 0 400 Feet

Aerial Source: ESRI, Maxar 2022

Survey Results

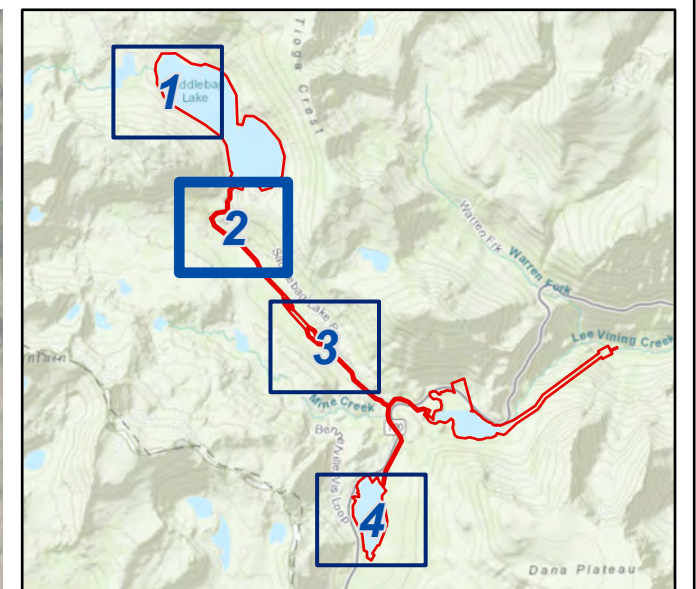
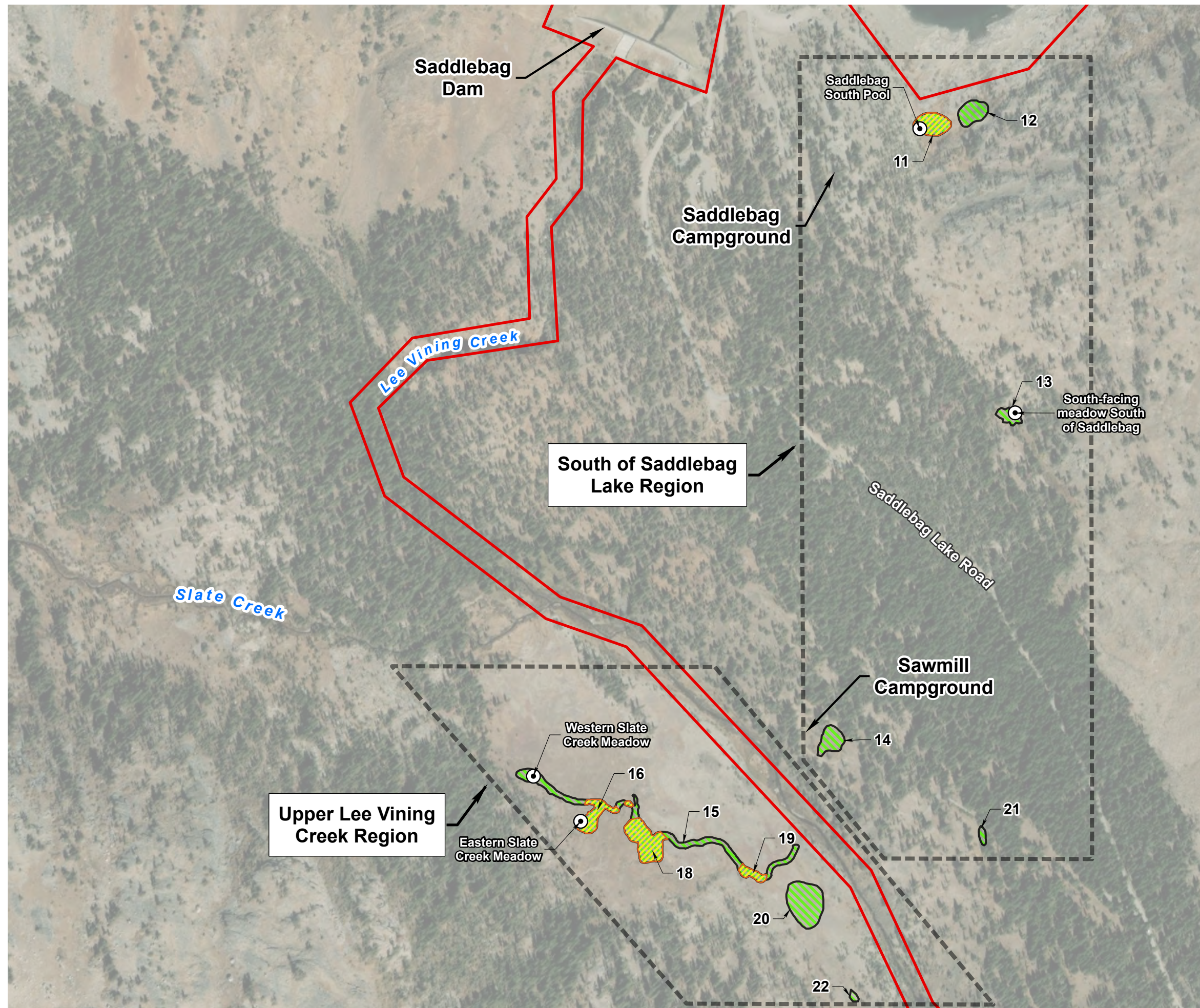
Lee Vining Hydroelectric
Relicensing Project

Figure A-4-1

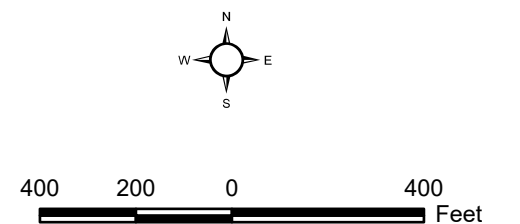


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- FERC Project Boundary
- Acoustic Detector
- YOTO Occupied Potential Habitat**
 - Potential Breeding Habitat Observed
 - Occupied, Toad Breeding Observed



Aerial Source: ESRI, Maxar 2022

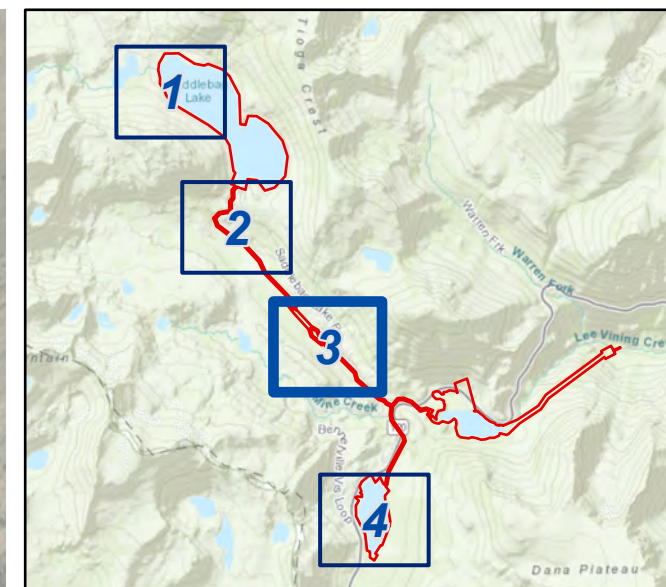
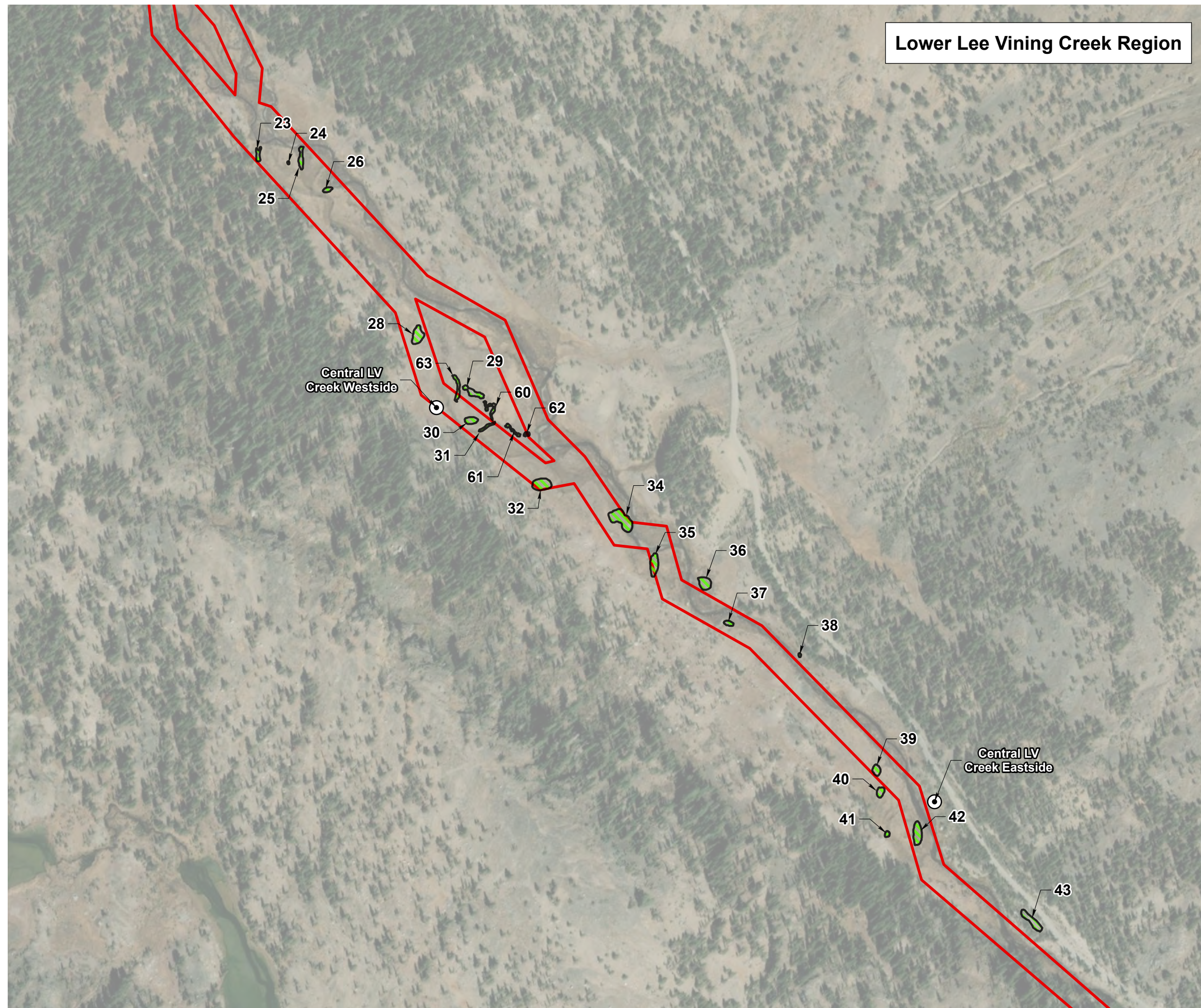
Survey Results

Lee Vining Hydroelectric
Relicensing Project

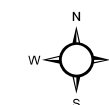
Figure A-4-2



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- FERC Project Boundary
- Acoustic Detector
- YOTO Occupied Potential Habitat**
- Potential Breeding Habitat Observed



400 200 0 400 Feet

Aerial Source: ESRI, Maxar 2022

Survey Results

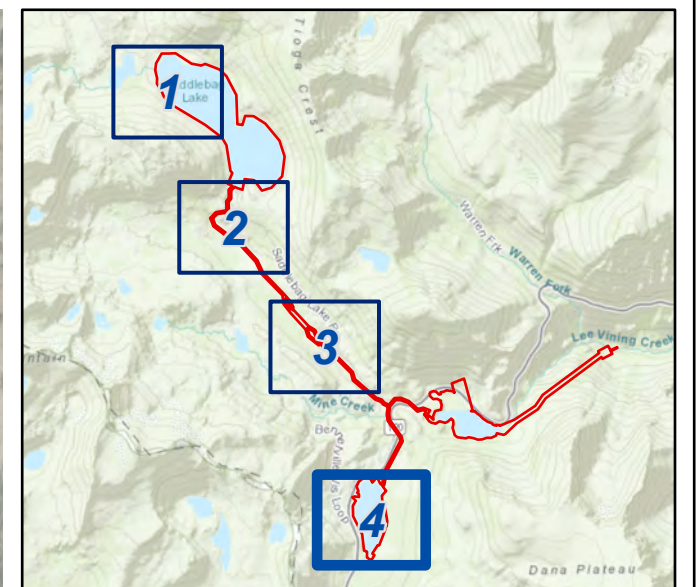
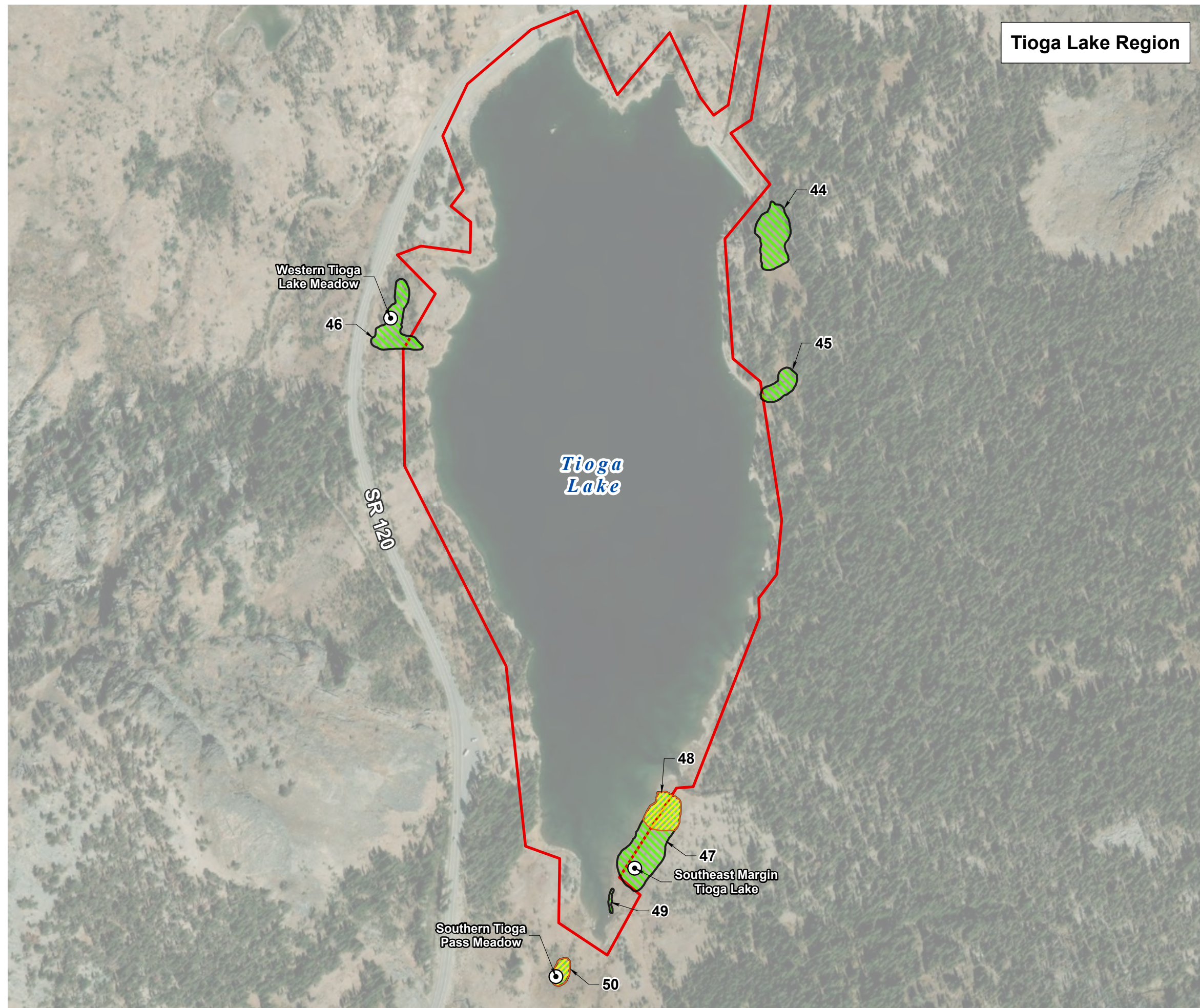
Lee Vining Hydroelectric
Relicensing Project

Figure A-4-3

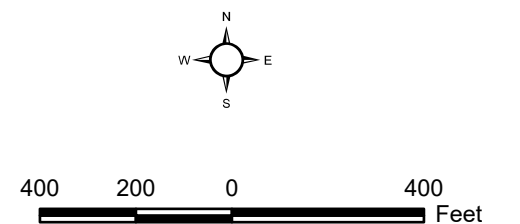


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- FERC Project Boundary
- Acoustic Detector
- YOTO Occupied Potential Habitat**
- Potential Breeding Habitat Observed
- Occupied, Toad Breeding Observed



Aerial Source: ESRI, Maxar 2022

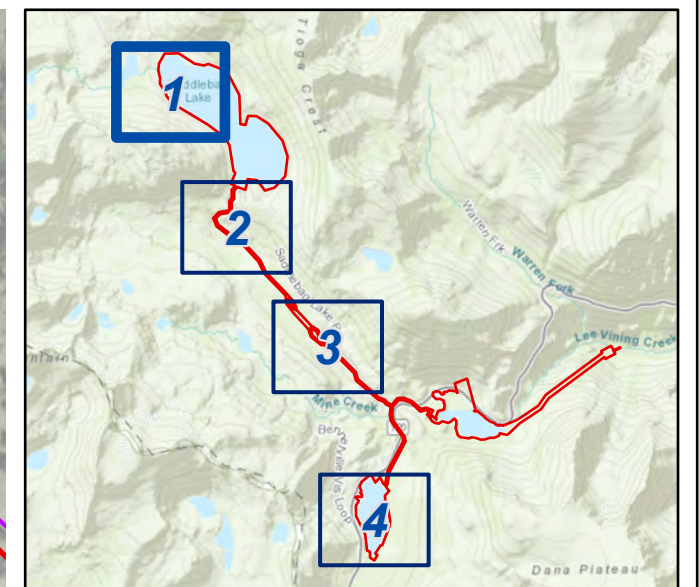
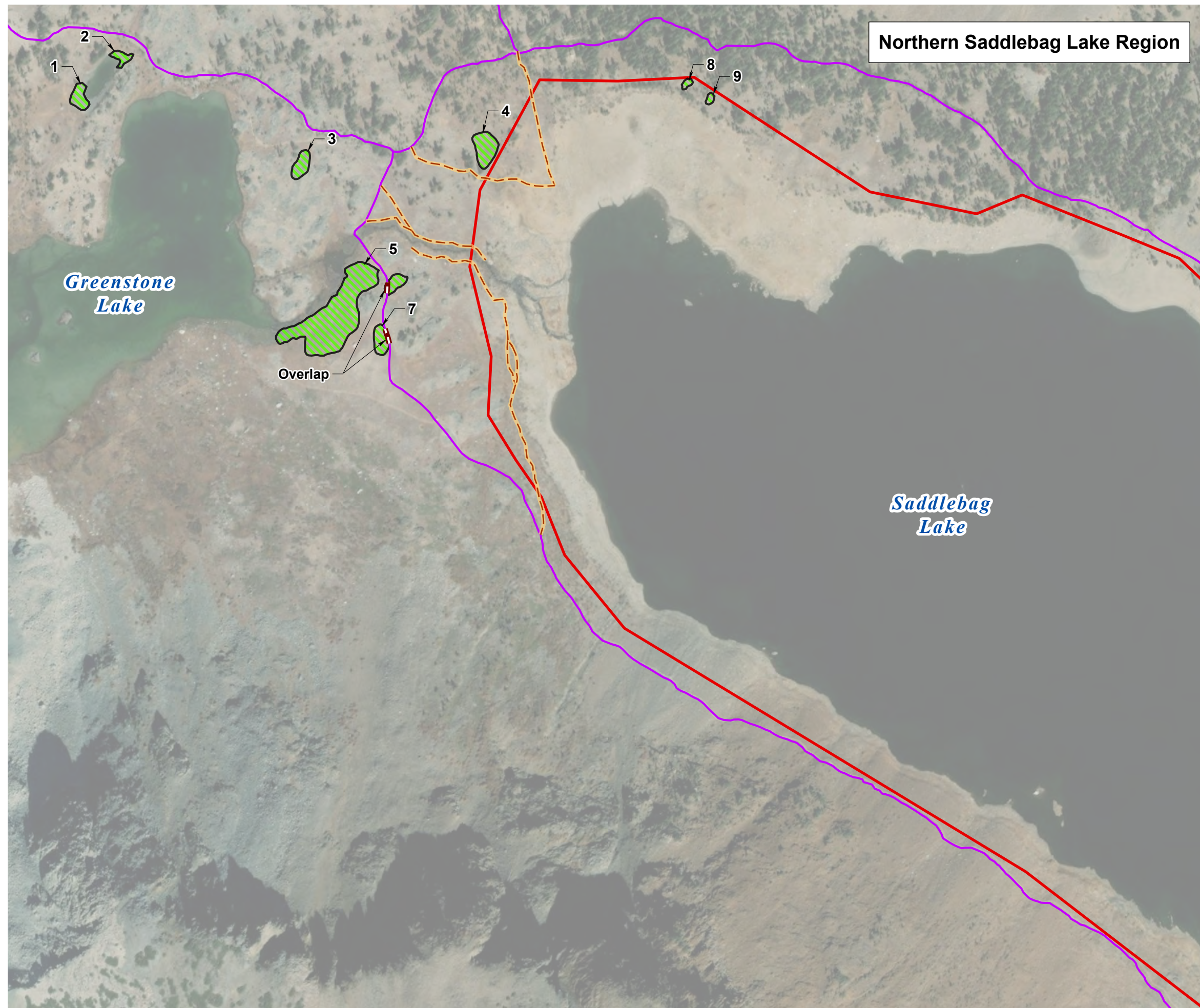
Survey Results
*Lee Vining Hydroelectric
Relicensing Project*

Figure A-4-4

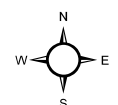
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Energy for What's Ahead

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- FERC Project Boundary
- Inyo National Forest Trail
- Informal Trail
- Trail Overlap Areas
- YOTO Occupied Potential Habitat**
- Potential Breeding Habitat Observed



400 200 0 400 Feet

Aerial Source: ESRI, Maxar 2022

**Trail-Habitat
Intersections**

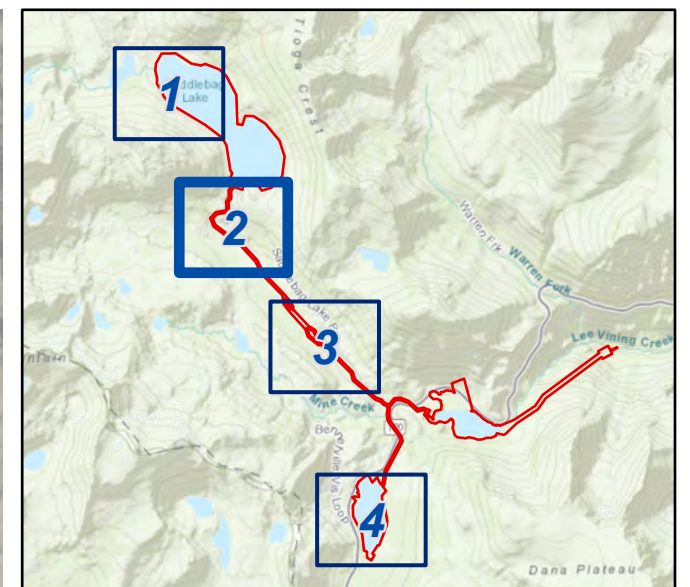
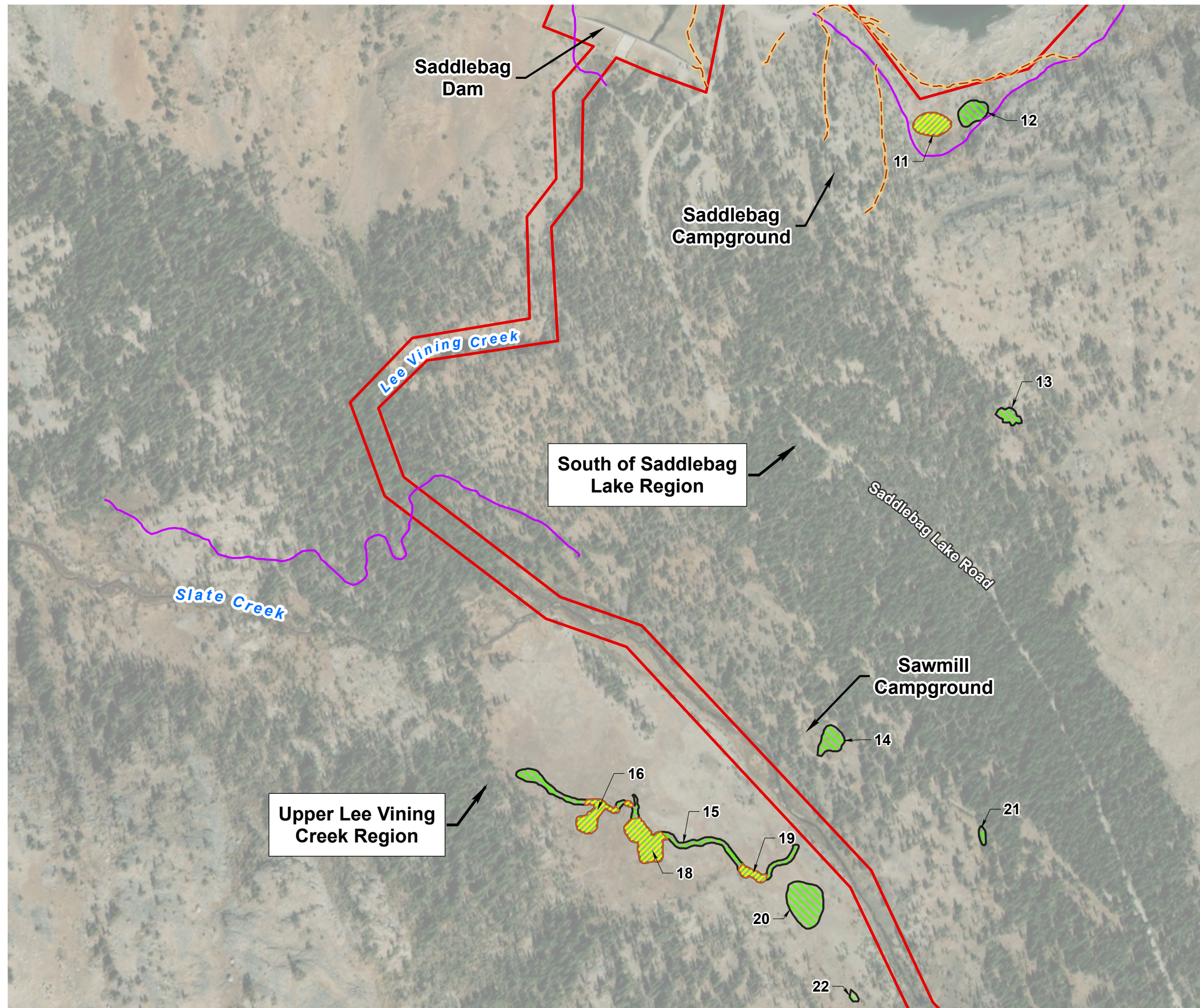
Figure A-5-1

*Lee Vining Hydroelectric
Relicensing Project*

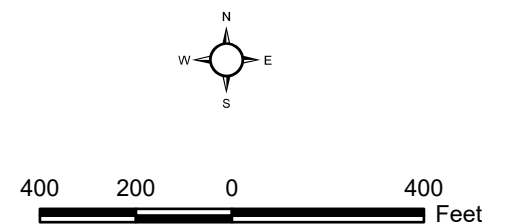


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- FERC Project Boundary
- Inyo National Forest Trail
- Informal Trail
- YOTO Occupied Potential Habitat**
 - Potential Breeding Habitat Observed
 - Occupied, Toad Breeding Observed



Aerial Source: ESRI, Maxar 2022

Trail-Habitat
Intersections

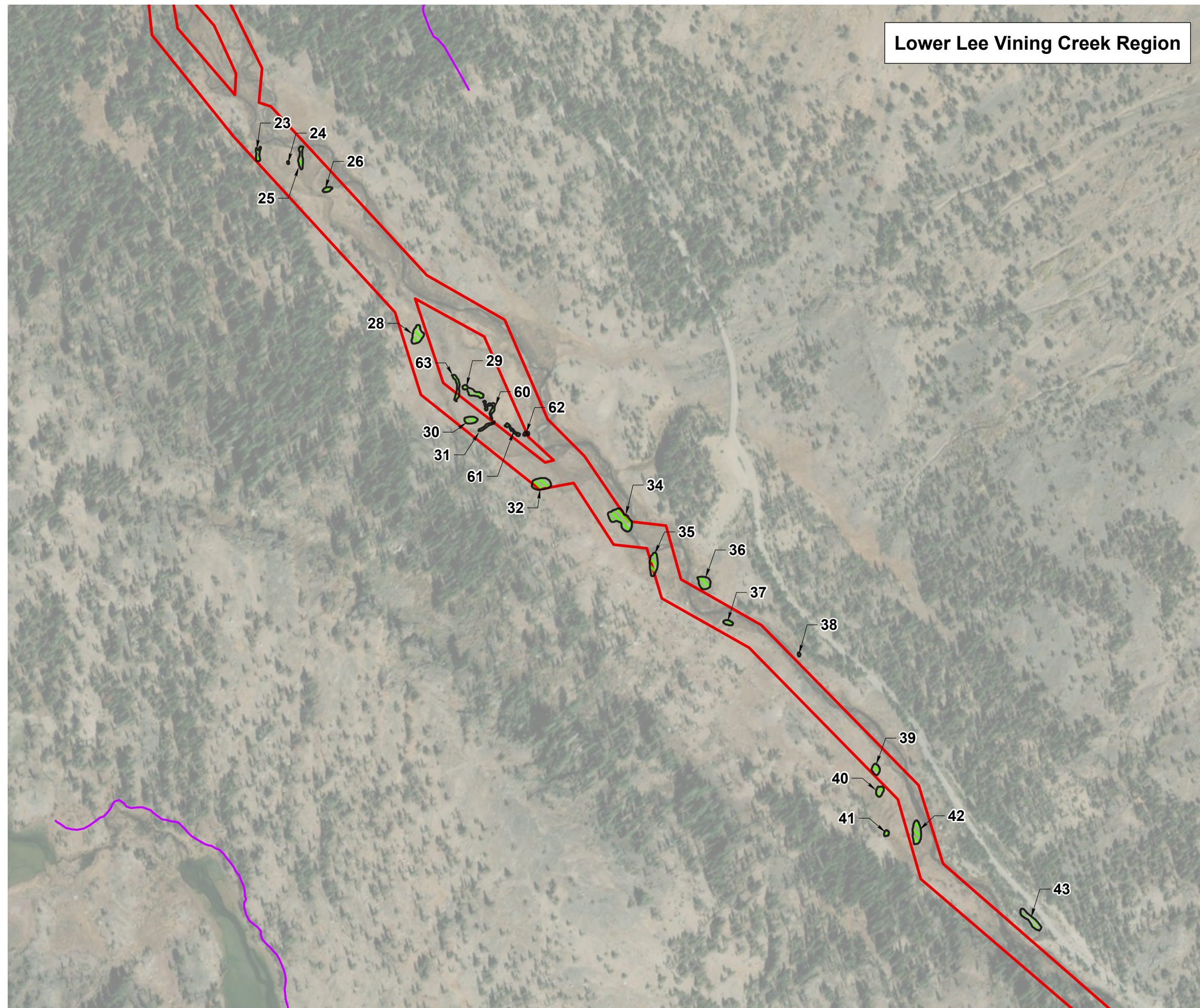
Lee Vining Hydroelectric
Relicensing Project

Figure A-5-2

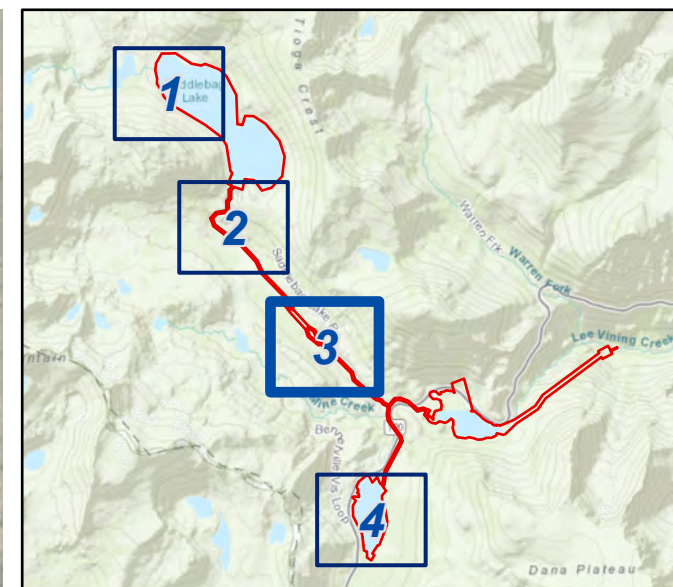
**SOUTHERN CALIFORNIA
EDISON**
Energy for What's Ahead

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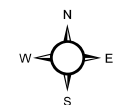
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Lower Lee Vining Creek Region



- FERC Project Boundary
- Inyo National Forest Trail
- YOTO Occupied Potential Habitat**
- Potential Breeding Habitat Observed



400 200 0 400 Feet

Aerial Source: ESRI, Maxar 2022

Trail-Habitat Intersections

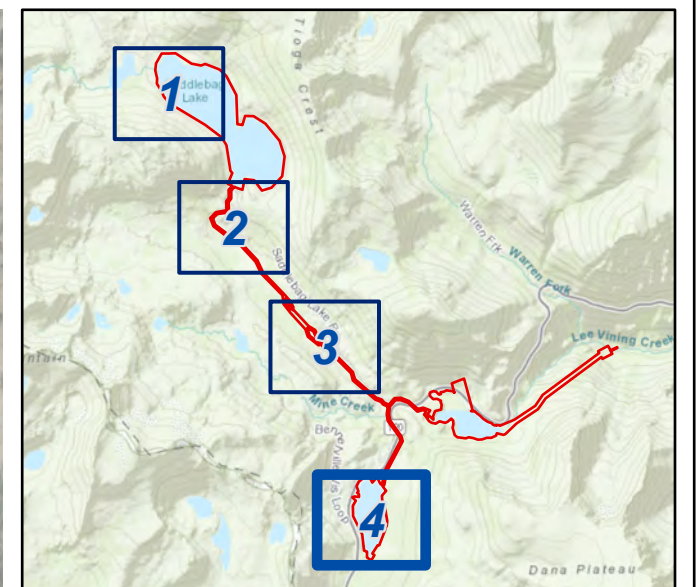
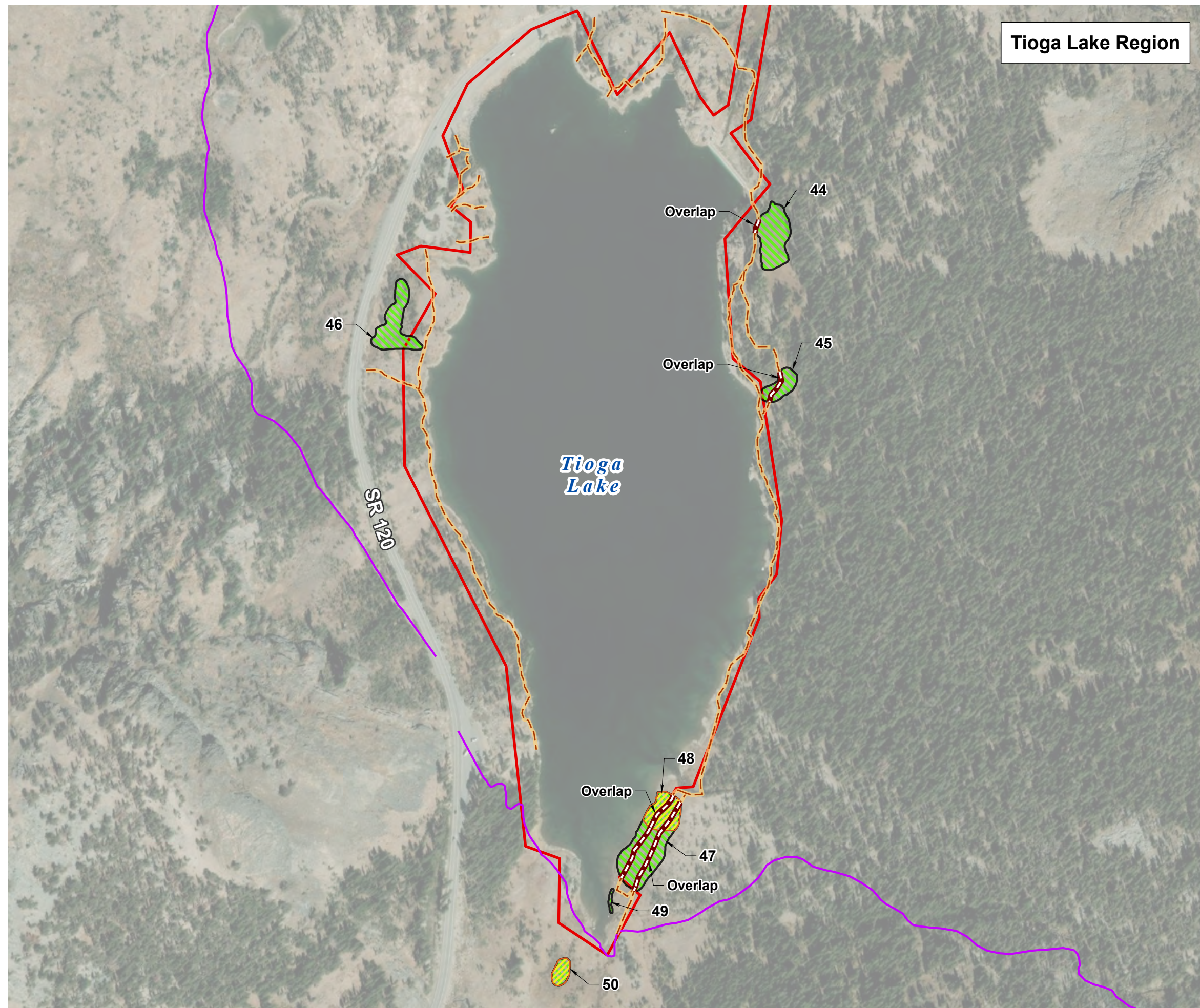
Lee Vining Hydroelectric Relicensing Project

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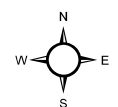
Figure A-5-3

SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead

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- FERC Project Boundary
- Inyo National Forest Trail
- Informal Trail
- Trail Overlap Areas
- YOTO Occupied Potential Habitat**
 - Potential Breeding Habitat Observed
 - Occupied, Toad Breeding Observed



400 200 0 400
Feet

Aerial Source: ESRI, Maxar 2022

Trail-Habitat

Intersections

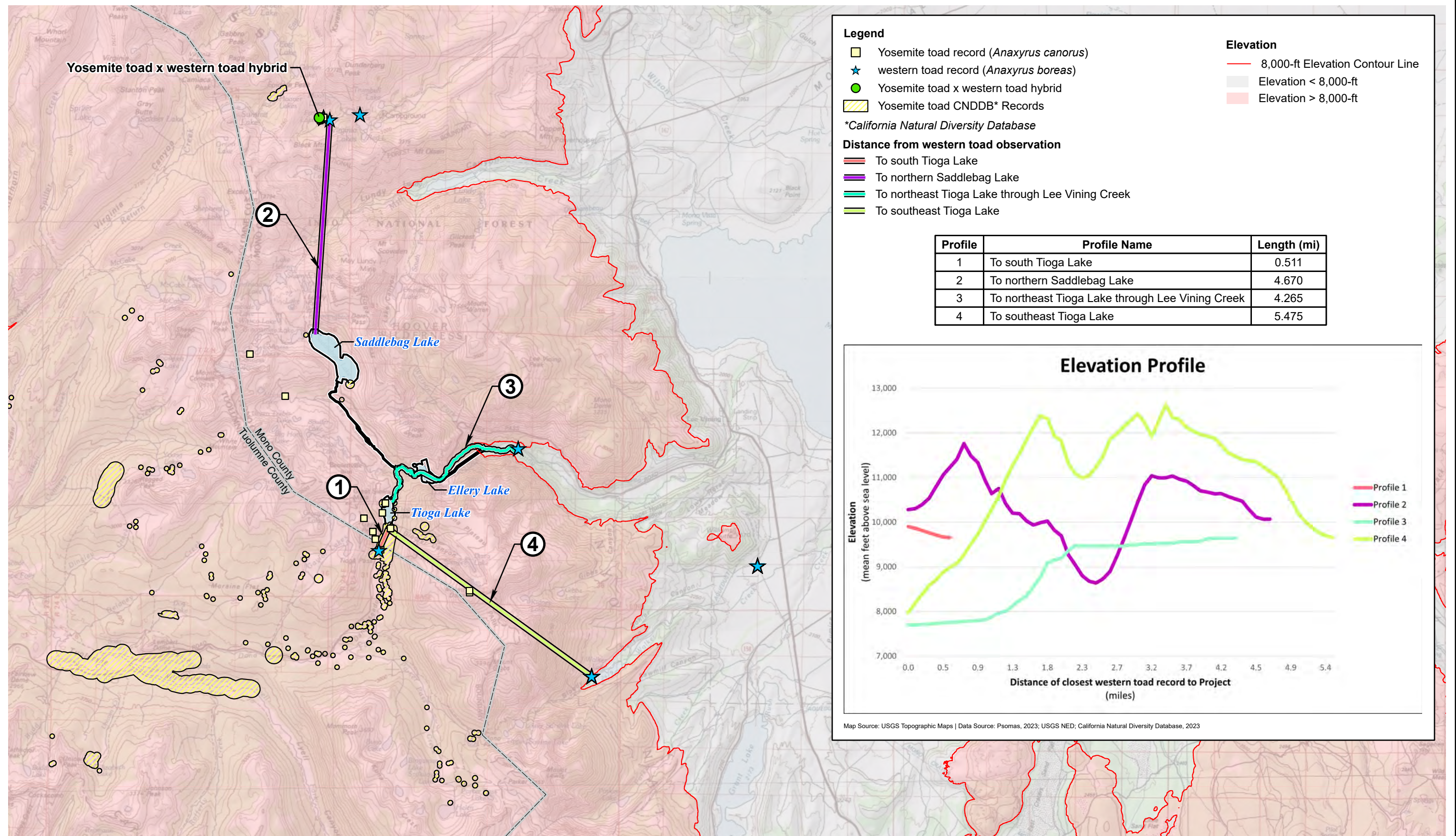
Lee Vining Hydroelectric
Relicensing Project

Figure A-5-4



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Historic Regional Yosemite Toad and Western Toad Locations

Lee Vining Hydroelectric Relicensing Project

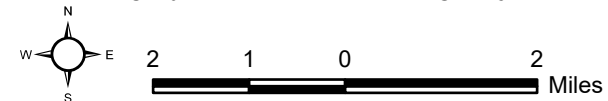


Figure A-6



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ATTACHMENT B
CONSECUTIVE AUDIO RECORDERS HOURS RECORDED BY DATE

Attachment B
Consecutive Audio Recorders Hours Recorded by Date

Date (2023)	Southern Tioga Pass Meadow	Southeast Margin Tioga Lake	Western Tioga Lake Meadow	Central Lee Vining Creek Eastside	Central Lee Vining Creek Westside	Western Slate Creek Meadow	Eastern Slate Creek Meadow	South-facing Meadow South of Saddlebag	Saddlebag South Pool	Northern Saddlebag Lake
6-Jul		9								
7-Jul	15	24	14	15						
8-Jul	24	24	24	24						
9-Jul	24	24	24	24						
10-Jul	24	24	24	24						
11-Jul	24	24	24	24						
12-Jul	24	24	24	24						
13-Jul	24	24	14	24	8					
14-Jul	24	24		10	24			12	14	
15-Jul	24	24			24			24	24	
16-Jul	24	24			24			24	24	
17-Jul	24	24			24			24	24	
18-Jul	24	24			24			24	24	
19-Jul	24	24			24			24	24	
20-Jul	24	24			24			24	24	
21-Jul	24	24			24			24	24	
22-Jul	24	24			24			24	24	
23-Jul	24	24			24			24	24	
24-Jul	24	24			24			24	24	
25-Jul	24	24			24			24	24	
26-Jul	24	24			24			24	24	
27-Jul	10	10			24	12	12	24	24	
28-Jul					24	24	24	24	23	
29-Jul					24	24	24	24	24	
30-Jul					24	24	24	24	24	
31-Jul					24	24	24	24	24	
1-Aug					24	24	24	24	24	
2-Aug					24	24	24	24	24	
3-Aug					24	24	24	24	24	
4-Aug					24	24	24	24	24	
5-Aug					24	24	24	24	24	
6-Aug					24	24	24	24	24	
7-Aug					24	24	24	24	24	
8-Aug					24	24	24	24	24	
9-Aug					24	24	24	25	24	12
10-Aug					25	13	24	24	25	24
11-Aug					24		24	24	24	24
12-Aug					24		24	24	24	24
13-Aug					24		24	24	24	24
14-Aug					24		24	24	24	24
15-Aug					24		24	24	24	24
16-Aug					24		24	24	24	24

Attachment B
Consecutive Audio Recorders Hours Recorded by Date

Date (2023)	Southern Tioga Pass Meadow	Southeast Margin Tioga Lake	Western Tioga Lake Meadow	Central Lee Vining Creek Eastside	Central Lee Vining Creek Westside	Western Slate Creek Meadow	Eastern Slate Creek Meadow	South-facing Meadow South of Saddlebag	Saddlebag South Pool	Northern Saddlebag Lake
17-Aug					24		24	24	24	24
18-Aug					24		24	24	24	24
19-Aug					24		24	24	24	24
20-Aug					24		24	24	24	24
21-Aug					24		24	24	24	24
22-Aug					24		24	24	24	24
23-Aug					24		24	24	24	24
24-Aug					24		24	24	24	24
25-Aug					24		24	24	24	24
26-Aug					24		24	24	24	24
27-Aug					24		24	24	24	24
28-Aug					24		24	24	24	24
29-Aug					24		24	24	24	24
30-Aug					24		24	24	24	24
31-Aug					24		24	24	24	24
1-Sep					24		24	24	24	24
2-Sep					24		24	24	24	24
3-Sep					24		24	24	24	24
4-Sep					24		24	24	24	24
5-Sep					24		24	24	24	24
6-Sep					24		24	24	24	24
7-Sep					24		24	24	24	24
8-Sep					24		24	24	24	24
9-Sep					24		24	21	24	24
10-Sep					24		24		24	24
11-Sep					24		24		24	24
12-Sep					24		24		24	24
13-Sep					24		24		24	24
14-Sep					24		24		24	24
15-Sep					24		24		24	24
16-Sep					24		24		24	24
17-Sep					24		24		24	4
18-Sep					24		24		24	
19-Sep					24		24		24	
20-Sep					24		24		24	
21-Sep					14		24		11	
22-Sep							24			
23-Sep							24			
24-Sep							24			
25-Sep							24			
26-Sep							24			
27-Sep							24			

Attachment B
Consecutive Audio Recorders Hours Recorded by Date

Date (2023)	Southern Tioga Pass Meadow	Southeast Margin Tioga Lake	Western Tioga Lake Meadow	Central Lee Vining Creek Eastside	Central Lee Vining Creek Westside	Western Slate Creek Meadow	Eastern Slate Creek Meadow	South-facing Meadow South of Saddlebag	Saddlebag South Pool	Northern Saddlebag Lake
28-Sep							24			
29-Sep							19			

ATTACHMENT C
SUMMARY OF VOUCHER SPECIMENS COLLECTED



IN REPLY REFER TO:

United States Department of the Interior

NATIONAL PARK SERVICE

Yosemite National Park

P. O. Box 577

Yosemite, California 95389

Saddle Bag Lake, Inyo National Forest, Mono County, California. Yosemite toad (*Anaxyrus* spp.) – tadpole collection for suspected potential hybridization/contact zone with Western toad (*Anaxyrus boreas*).

August 23, 2023

TE-86906B-2 – SPECIAL TERMS AND CONDITIONS requirement for [3. Authorized Take.] 14-day report for the collection of potential *Anaxyrus canorus* larvae (tadpoles).

By this email message, you are authorized to collect Yosemite toad (*Anaxyrus canorus*) toe clips, tail clips, or whole voucher specimens (tadpoles only), as specified in your June 27, 2023, email request, per the conditions of your recovery permit (86906B-2) and attached amendment. Surveys and genetic sampling will be conducted in the Saddlebag Lake region, Inyo National Forest, Mono County, California. Please remember to carry a copy of your permit while doing the work and to follow the terms and conditions therein. This authorization does not include access to the property which must be arranged with the landowner or manager. Please let us know if the activities are not performed as authorized, or if they are done by a different permittee under a separate authorization.

Please send survey reports with the reference # [86906B-2-RFWO-Grasso] to FW8_RFWO_Permits@fws.gov and Chad Mellison (chad_mellison@fws.gov) to your direction.

Site Location

Saddle Bag Lake and vicinity – Inyo National Forest, Mono County, California

Collection Period

August 8, 2023

Start time: 1200

End time: 1400

Collector: Rob Grasso (Yosemite National Park)

Assistants: Nico Grasso (volunteer)

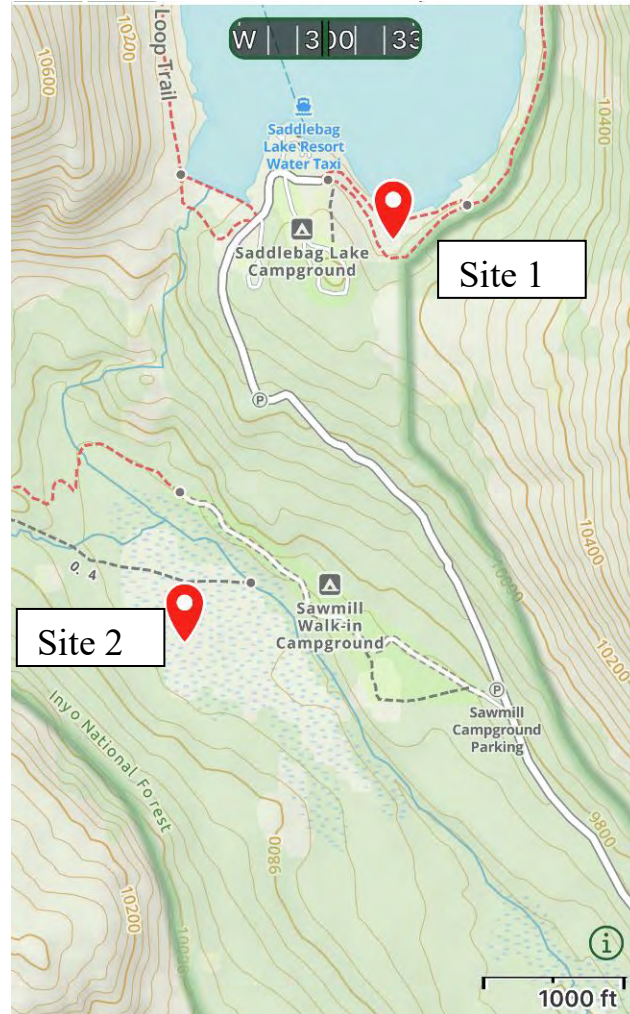
Summary: Due to suspected contact zone between *Anaxyrus canorus* and *A. boreas*, special permission was requested to collect voucher specimens from two locations near Saddle Bag Lake, Inyo National Forest, Mono County, California that could be requested for genetic analyses to establish if hybridization is occurring in this region.

On 8 August 2023, Rob Grasso and one volunteer traveled to Saddle Bag Lake to collect *A. spp.* specimens to be available for genetic analyses. The first location visited was approximately 0.25 mi. east of the dam along the south shore of the lake in a small, ponded meadow area: [Latitude: 37.96511°; Longitude: -119.26891°, Elevation: 10,079 ft, Map 1, Photo 1] accessed via the lake loop trailhead parking at the lake shore resort. Approximately 200-300 early-stage tadpoles were observed in two distinct pools in the meadow as well as a total of 16 recently metamorphosed or second year toadlets along pond shorelines. A total of 10 *A. spp* tadpoles were collected from 4-6 distinct aggregations of tadpoles from both ponds and placed in 90% ethanol. Tadpoles were small (< 20 mm), dark (black), and had a paddle-shaped tail equal to the length of the body. All characteristics consistent with *A. canorus*. Metamorphs/toadlets also had paratoid gland spacing consistent with *A. canorus*. No adult toads were observed.

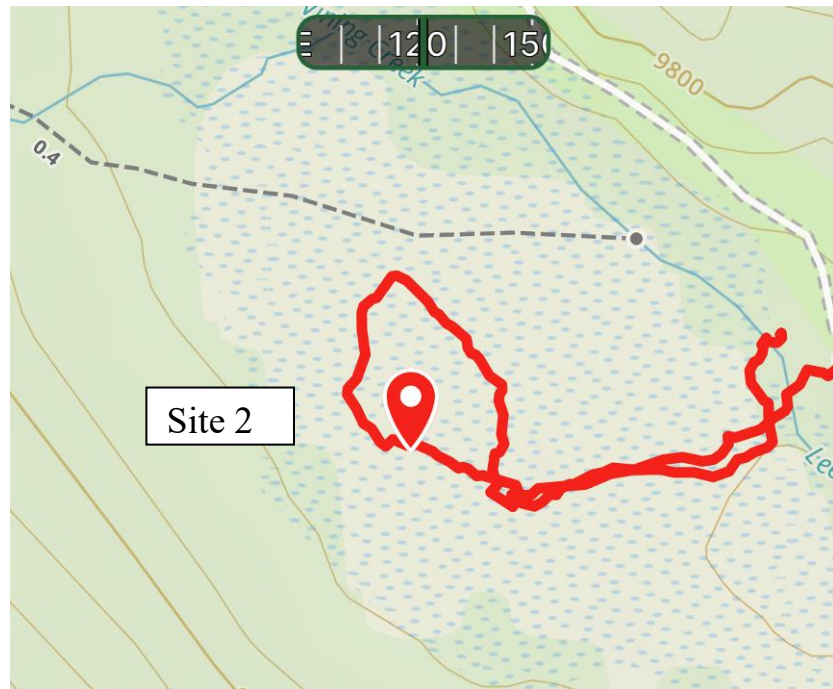
The second collection was located below the Saddle Bag Lake dam in a large meadow west of Lee Vining Creek [Latitude: 37.95694°; Longitude: -119.27389°, Elevation: 9,850 ft, Map 1, Photo 2]. A visual encounter survey of suitable *A. canorus* habitat in the meadow (Map 2) was performed of the area prior to collecting *A. spp.* tadpoles in

the meadow were sparse and spread out. We estimated less than 250 total tadpoles in the area. A total of 10 *A. spp.* tadpoles were collected from 6-8 distinct small aggregations of tadpoles from around the meadow in small ponds as well as stream locations and placed in 90% ethanol. Tadpoles were large (> 20 mm), dark (black), and had a paddle-shaped tail equal to the length of the body. All characteristics consistent with *A. canorus*. No other life stages of toads were observed.

Disposition of *A. canorus* samples: All samples ($n=20$) are preserved in ethanol and currently stored in -20 freezer at the Yosemite National Park Maintenance Facility located at 5083 Foresta Rd in El Portal, CA, 95318. They are on the first-floor freezer in the wet lab of the Resources Management and Science Building and will be available upon request to an entity with permission from the U.S. Fish & Wildlife Service.



Map 1. Depicting two *Anaxyrus* spp. collection locations (red balloon markers) in proximity to Saddle Bag Lake, Inyo National Forest, Mono County, California. Site 1, approximately 0.25 mi. from Saddle Bag Lake dam; and Site 2 west of Lee Vining Creek and Sawmill Walk-in Campground.



Map 2. Depicting visual encounter survey track of Site 2 west of Sawmill Walk-in Campground and Lee Vining Creek, Inyo National Forest, Mono County, California.

ATTACHMENT D
POTENTIAL YOSEMITE TOAD BREEDING HABITAT SURVEYED

Attachment D
Potential Yosemite Toad Breeding Habitat Surveyed

General Site Location	Pool No.	Tree cover ^b	Adjacent Vegetative Cover ^{a,c}		Dominant Adjacent Plant Species ^a			Wildlife Burrows Present ^a	Emergent vegetation ^c	Aquatic detritus	Observed inflow	Inflow	Approx. area pooled (m ²)	Deepest water depth (cm)	Percentage of pool <= 30 cm deep ^c	Mean distance to 3 closest habitat areas (m)	Treefrog present	Toad present	Unknown tadpoles present	Predators present
			Herbs or <1 m tall	Woody or >1 m tall	Grass (Poacea family)	Shrubby willow (<i>Salix</i> spp.)	Pine (<i>Pinus</i> spp.)													
Northern Saddlebag Lake	1	Yes	75%	25%	X		X	No	25%	Yes	Offsite runoff	Lentic (still)	516	>30	75%	224	tadpoles	None	No	mountain garter snake
Northern Saddlebag Lake	2	Yes	75%	25%	X	X		Yes	50%	Yes	Offsite runoff	Lentic (still)	286	7	100%	218	tadpoles	None	No	None
Northern Saddlebag Lake	3	Yes	75%	<5%	X			No	50%	Yes	Greenstone Lake	Lentic (still)	541	>30	75%	165	tadpoles	None	No	None
Northern Saddlebag Lake	4	Yes	95%	5%	X			No	75%	Yes	Offsite runoff	Lentic (still)	981	15	100%	182	None	None	No	None
Northern Saddlebag Lake	5	No	>95%	<5%	X			Yes	75%	Yes	Greenstone Lake/ Offsite runoff	Lentic (still)	5,741	>30	50%	52	adults, tadpoles	None	No	None
Northern Saddlebag Lake	7	No	>95%	<5%	X			Yes	>95%	Yes	Offsite runoff	Lentic (still)	581	20	100%	88	None	None	No	None
Northern Saddlebag Lake	8	Yes	100%	5%	X		X	Yes	50%	Yes	Offsite runoff	Lentic (still)	113	7	100%	225	None	None	No	None
Northern Saddlebag Lake	9	Yes	100%	5%	X		X	Yes	50%	Yes	Offsite runoff	Lentic (still)	103	7	100%	238	None	None	No	None
South of Saddlebag Lake	11	Yes	>95%	<5%	X			Yes	25%	Yes	Offsite runoff	Lentic (still)	1,008	>30	25%	366	adults, tadpoles	adults, tadpoles	No	None
South of Saddlebag Lake	12	Yes	75%	<5%	X			Yes	25%	Yes	Offsite runoff	Lentic (still)	856	>30	50%	374	tadpoles	None	No	None
South of Saddlebag Lake	13	Yes	75%	<5%	X			No	75%	Yes	Offsite runoff	Lentic (still)	437	20	100%	376	tadpoles	None	No	None
South of Saddlebag Lake	14	Yes	>95%	<5%	X			No	50%	Yes	Offsite runoff	Lentic (still)	815	10	100%	156	tadpoles	None	No	None
Upper Lee Vining Creek	15	No	>95%	<5%	X	X		Yes	25%	Yes	Offsite runoff	Lotic (flowing)	5,274	>30	75%	103	tadpoles	None	No	mountain garter snake
Upper Lee Vining Creek	16	No	>95%	<5%	X			Yes	75%	Yes	Offsite runoff	Lentic (still)	941	20	None	0	None	tadpoles	No	mountain garter snake
Upper Lee Vining Creek	18	No	>95%	<5%	X			Yes	50%	Yes	Offsite runoff	Lentic (still)	1,640	8	100%	0	tadpoles	tadpoles	No	mountain garter snake
Upper Lee Vining Creek	19	No	>95%	<5%	X			Yes	25%	Yes	Offsite runoff	Lotic (flowing)	359	15	100%	0	None	tadpoles	No	brook trout
Upper Lee Vining Creek	20	No	>95%	<5%	X			Yes	>95%	Yes	Offsite runoff	Lentic (still)	2,031	3	100%	91	None	None	No	None
South of Saddlebag Lake	21	Yes	75%	75%			X	Yes	50%	Yes	Offsite runoff	Lentic (still)	154	8	100%	209	None	None	No	None
Upper Lee Vining Creek	22	Yes	75%	25%	X		X	Yes	75%	Yes	Offsite runoff	Lentic (still)	99	20	100%	168	tadpoles	None	No	None
Lower Lee Vining Creek	23	Yes	>95%	25%	X	X		Yes	25%	Yes	Lee Vining Creek	Lentic (still)	75	30	100%	55	None	None	No	None
Lower Lee Vining Creek	24	No	95%	<5%	X	X		Yes	25%	Yes	Offsite runoff	Lentic (still)	9	25	100%	32	None	None	No	None
Lower Lee Vining Creek	25	No	25%	75%		X		No	>95%	Yes	Lee Vining Creek	Lentic (still)	123	15	100%	31	None	None	No	brook trout
Lower Lee Vining Creek	26	No	75%	25%	X	X		No	75%	Yes	Lee Vining Creek	Lotic (flowing)	52	>30	25%	58	None	None	No	brook trout
Lower Lee Vining Creek	28	Yes	75%	25%	X	X		Yes	75%	Yes	Offsite runoff	Lentic (still)	227	>30	50%	81	adults	None	No	None
Lower Lee Vining Creek	29	No	>95%	<5%	X			Yes	25%	Yes	Offsite runoff	Lentic (still)	155	7	100%	11	tadpoles	None	No	None
Lower Lee Vining Creek	30	No	>95%	<5%	X			Yes	75%	Yes	Offsite runoff	Lentic (still)	112	20	100%	16	tadpoles	None	No	None
Lower Lee Vining Creek	31	No	>95%	<5%	X			Yes	25%	Yes	Offsite runoff	Lentic (still)	55	>30	75%	8	tadpoles	None	Yes	None
Lower Lee Vining Creek	32	No	>95%	<5%	X			Yes	75%	Yes	Offsite runoff	Lentic (still)	277	6	100%	63	None	None	No	None
Lower Lee Vining Creek	34	No	>95%	<5%	X			Yes	>95%	Yes	Lee Vining Creek	Lentic (still)	460	3	100%	74	None	None	No	None
Lower Lee Vining Creek	35	No	>95%	<5%	X			Yes	50%	Yes	Lee Vining Creek	Lotic (flowing)	221	>30	25%	65	None	None	No	None
Lower Lee Vining Creek	36	No	50%	50%		X		No	50%	Yes	Lee Vining Creek	Lotic (flowing)	191	>30	None	66	None	None	No	brook trout
Lower Lee Vining Creek	37	Yes	>95%	25%	X	X		Yes	75%	Yes	Lee Vining Creek	Lentic (still)	57	>30	25%	79	None	None	No	brook trout
Lower Lee Vining Creek	38	Yes	>95%	75%		X		No	25%	Yes	Lee Vining Creek	Lentic (still)	12	>30	25%	129	None	None	No	None
Lower Lee Vining Creek	39	No	>95%	50%	X			Yes	>95%	Yes	Offsite runoff	Lentic (still)	99	>30	50%	53	None	None	No	None
Lower Lee Vining Creek	40	Yes	>95%	50%	X			Yes	>95%	Yes	Offsite runoff	Lentic (still)	91	>30	50%	36	tadpoles	None	No	None
Lower Lee Vining Creek	41	Yes	>95%	50%	X			Yes	50%	Yes	Offsite runoff	Lentic (still)	34	7	100%	47	None	None	No	None
Lower Lee Vining Creek	42	No	>95%	25%	X	X		Yes	50%	Yes	Lee Vining Creek	Lentic (still)	245	>30	25%	52	adults	None	No	None
Lower Lee Vining Creek	43	Yes	<5%	>95%	X	X	X	Yes	75%	Yes	Offsite runoff	Lentic (still)	230	25	100%	188	None	None	No	None
Margins of Tioga Lake	44	Yes	50%	75%			X	Yes	75%	Yes	Offsite runoff	Lotic (flowing)	2,589	5	100%	404	None	None	No	None
Margins of Tioga Lake	45	Yes	75%	50%	X		X	No	75%	No	Offsite runoff	Lotic (flowing)	1,084	5	100%	348	None	None	No	None
Margins of Tioga Lake	46	Yes	>95%	75%			X	Yes	>95%	Yes	Offsite runoff	Lotic (flowing)	2,352	10	75%	492	None	None	No	None
Margins of Tioga Lake	47	No	>95%	25%	X	X		Yes	75%	Yes	Offsite runoff	Lentic (still)	4,950	7	100%	211	None	None	No	None
Margins of Tioga Lake	48	No	>95%	<5%	X			Yes	>95%	Yes	Offsite runoff	Lotic (flowing)	1,654	10	100%	44	None	tadpoles	No	None

Attachment D
Potential Yosemite Toad Breeding Habitat Surveyed

General Site Location	Pool No.	Tree cover ^b	Adjacent Vegetative Cover ^{a,c}		Dominant Adjacent Plant Species ^a			Wildlife Burrows Present ^a	Emergent vegetation ^c	Aquatic detritus	Observed inflow	Inflow	Approx. area pooled (m ²)	Deepest water depth (cm)	Percentage of pool <= 30 cm deep ^c	Mean distance to 3 closest habitat areas (m)	Treefrog present	Toad present	Unknown tadpoles present	Predators present
			Herbs or <1 m tall	Woody or >1 m tall	Grass (Poacea family)	Shrubby willow (<i>Salix</i> spp.)	Pine (<i>Pinus</i> spp.)													
Margins of Tioga Lake	49	No	>95%	25%	X			Yes	50%	Yes	Tioga Lake	Lentic (still)	103	10	100%	242	None	None	No	brook trout
Margins of Tioga Lake	50	Yes	>95%	<5%	X			Yes	50%	Yes	Offsite runoff	Lentic (still)	574	>30	75	309	None	tadpoles	No	None
Lower Lee Vining Creek	60	No	>95%	<5%	X			Yes	25%	Yes	Offsite runoff	Lentic (still)	93	5	100%	7	tadpoles	None	No	None
Lower Lee Vining Creek	61	No	>95%	<5%	X			Yes	25%	Yes	Offsite runoff	Lentic (still)	58	12	100%	11	tadpoles	None	No	mountain garter snake
Lower Lee Vining Creek	62	No	>95%	<5%	X			Yes	25%	Yes	Offsite runoff	Lentic (still)	22	15	100%	28	tadpoles	None	No	None
Lower Lee Vining Creek	63	No	>95%	<5%	X			Yes	>95%	Yes	Offsite runoff	Lentic (still)	114	>30	25%	19	adults, tadpoles	None	Yes	None

Legend:
a - within 2 meters from water's edge
b - within 5 meters from water's edge
c - None, 25%, 50%, 75%, >95%
cm = centimeters, m = meters, m² = square meters, spp. = species

APPENDIX B

SITE PHOTO LOCATIONS AND REPRESENTATIVE PHOTOGRAPHS

D:\Projects\3KLELeeViningPROLee_Vining_Project\Lee_Vining_Project.aprx\Att_SP



Site Photo Locations

Lee Vining Hydroelectric Relicensing Project



3,200 1,600 0 3,200
Feet

Appendix B-1



(Rev: 1-26-2024 JVR) R:\Projects\KLE\3KLE020100\Graphics\Wildlife\Att_SP.pdf



Photo 1. Photo of a coyote (*Canis latrans*) taken by Camera B along the western side of Lee Vining Creek facing west.



Photo 2. Photo of a mule deer (*Odocoileus hemionus*) taken by Camera C on the eastern side of Tioga Lake facing east.



Photo 3. Photo taken by Camera C of a juvenile black bear (*Ursus americanus*).

Representative Photographs

Lee Vining Hydroelectric Relicensing Project

Appendix B-2



Photo 4. Photo taken by Camera C of a mule deer at 1:33 AM.



Photo 5. Photo taken by Camera C of a mountain lion (*Puma concolor*) carrying prey at 1:49 AM.



Photo 6. Photo taken by Camera C of the same mountain lion continuing to carry prey at 1:50 AM.

Representative Photographs

Lee Vining Hydroelectric Relicensing Project

Appendix B-3



Photo 7. Representative photo of the area monitored by Camera A between Saddlebag Lake and Greenstone Lake. No clearly distinguishable or otherwise notable wildlife photo were taken by this camera.



Photo 8. Photo of the location recorded by Bat Acoustic Recorder A downstream of Saddlebag Dam.



Photo 9. Photo of the location recorded by Bat Acoustic Recorder B downstream of Poole Powerhouse.

Representative Photographs

Lee Vining Hydroelectric Relicensing Project

Appendix B-4

ATTACHMENT 2

TERR-1 Botanical Resources Technical Report

SOUTHERN CALIFORNIA EDISON Lee Vining Hydroelectric Project (FERC Project No. 1388)



GENERAL BOTANICAL RESOURCES SURVEY (TERR-1) FINAL TECHNICAL REPORT



SEPTEMBER 2024

SOUTHERN CALIFORNIA EDISON

**Lee Vining Hydroelectric Project
(FERC Project No. 1388)**

GENERAL BOTANICAL RESOURCES SURVEY (TERR-1) FINAL TECHNICAL REPORT

Southern California Edison
2244 Walnut Grove Avenue
Rosemead, CA 91770

September 2024

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Appendix C	California Native Species Field Survey Form
Appendix D	Plant Compendium

LIST OF ACRONYMS AND ABBREVIATIONS

amsl	above mean sea level
AS	Above Saddlebag
BE	Below Ellery
BS	Below Saddlebag
Cal-IPC	California Invasive Plant Council
CALVEG	Classification and Assessment with Landsat of Visible Ecological Groupings
CDFW	California Department of Fish and Wildlife
CNDDDB	California Natural Diversity Database
CRPR	California Rare Plant Rank
FERC	Federal Energy Regulatory Commission
GPS	Global Positioning System
LLV	Lower Lee Vining
MC	Mine Creek
MLV	Middle Lee Vining
NDVI	Normalized Difference Vegetation Index
NIR	near-infrared
NNIP	non-native invasive plant
Project	Lee Vining Hydroelectric Project (FERC Project No. 1388)
R	red light
SCE	Southern California Edison
TWG	Technical Working Group
ULV	Upper Lee Vining
USC	Upper Slate Creek
USFS	U.S. Forest Service
USGS	U.S. Geological Survey

1.0 INTRODUCTION

This technical report presents the results of Study TERR-1 conducted in 2022 and 2023 for the Lee Vining Hydroelectric Project (Project). The *TERR-1 General Botanical Resources Survey Technical Study Plan* details Southern California Edison's (SCE) proposal for study objectives, study area, methods, and schedule for the effort. The Final Technical Study Plan was filed with the Federal Energy Regulatory Commission (FERC) on April 25, 2022 (SCE, 2022).

During the Technical Working Group (TWG) meetings, SCE and Stakeholders identified the need to conduct botanical resources studies to determine the presence of sensitive natural communities, special-status plant species, invasive species, and riparian habitat at Project facilities and U.S. Forest Service (USFS) recreational areas.

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 Environmental Assessment (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. Relicensing is an appropriate time to examine sensitive plant species presence in and around the Project to determine the effects of Project operations on those plants in the context of the most recent *Land Management Plan for the Inyo National Forest* (USFS, 2019), the federal and state Endangered Species Acts, the National Environmental Policy Act, and the California Environmental Quality Act.

As outlined in Study TERR-1, the studies were conducted in 2022 and 2023.

2.0 STUDY GOALS AND OBJECTIVES

The goal of this study is to supplement the existing information regarding sensitive botanical resources in the study area by:

- Ground-truthing the existing USFS vegetation map (USFS, 2020a), including identification of any sensitive natural communities;
- Documenting the presence of species listed by the federal and/or state Endangered Species Acts or proposed for listing, e.g., whitebark pine (*Pinus albicaulis*);
- Documenting the presence of other special-status plants including species with a California Rare Plant Rank (CRPR) of 1 or 2 and USFS Species of Conservation Concern;
- Documenting non-native, invasive plants identified in the Inyo National Forest Invasive Plant Inventory Database (NRM – TESP/IS, 2018) and on the California Invasive Plant Council (Cal-IPC) Inventory (Cal-IPC, 2020);

- Incorporating results of the riparian monitoring study undertaken as part of the existing license (Read, 2004, 2012, 2017, 2022); and
- Performing a focused study of selected riparian habitat areas using Normalized Difference Vegetation Index (NDVI) to (1) compare “test” reaches and “control” reaches and (2) to assess whether or not there have been changes resulting from hydro-resource optimization.

2.1. STUDY AREAS

Three study areas were used as part of the botanical resources survey. This includes a Botanical Resources Study Area, a Riparian Monitoring Study Area, and an NDVI Study Area.

2.1.1. BOTANICAL RESOURCES STUDY AREA

Surveys conducted within the Botanical Resources Study Area include ground-truthing the USFS-mapped vegetation communities and documenting the presence of special-status and invasive plant species. The Botanical Resources Study Area is shown on the associated mapbook in Appendix A and includes all aboveground Project facilities and USFS recreation areas, including an approximate 100-foot buffer around these areas:

- Saddlebag Dam and Campgrounds (SD): Saddlebag Dam, spillway, and valve house; Saddlebag Day Use Picnic/Fishing Site; Saddlebag Lake Campground; Saddlebag Lake Group Campground; Saddlebag Lake Loop trailhead; and the access road to Saddlebag Dam
- Rhinedollar Dam and Penstock Trail (RD): Rhinedollar Dam, tunnel intake, spillway, and valve house and Penstock Trail
- Tioga Dam (TD): Tioga Dam, Tioga Auxiliary Dam, and access road
- Poole Powerhouse (PP)
- Sawmill Campground (SM): Sawmill Walk-in Campground including parking area
- Junction Campground (JC)
- Ellery Lake Campground (EC)
- Ellery Lake Overlook (EO)
- Tioga Lake Campground (TC)

Select riparian areas were extended beyond the 100-foot buffer (i.e., the portion of Lee Vining Creek below Saddlebag Dam and the lakeshore around the Saddlebag Day Use Picnic/Fishing Site) at the recommendation of the USFS to include additional riparian

areas for analysis. In 2022, the area surveyed was adjusted in the field based on accessibility and topography.

2.1.2. RIPARIAN MONITORING STUDY AREA

The Riparian Monitoring Study Area was developed as part of the vegetation monitoring conducted for the current FERC license, which began in 1999. The study area is located along Lee Vining Creek between Saddlebag Lake and the confluence with Slate Creek (Appendix A). The study area consists of three sites with Site 1 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 3-meter-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, and 2022).

2.1.3. NDVI STUDY AREA

The NDVI Study Area was used (1) to compare test reaches and control reaches and (2) to assess the potential effects of hydro-resource optimization on riparian resources. The NDVI Study Area extends from above Saddlebag Lake to below Aspen Campground (Table 2.1-1 and the associated mapbook in Appendix A). Test reaches were located along Lee Vining Creek, within or adjacent to the FERC Project Boundary, that are downstream of Project water releases, including minimum instream flows 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 2.1-1. NDVI Study Sites and Source for Delimiting Sampling Plots

Study Site	Control/Test-Influenced	Affected by Hydro-Resource Optimization	Willow Riparian Scrub Vegetation Determination	Wet Meadow Vegetation Determination
Above Saddlebag (AS)	Control	No	Based on Google Earth aerial imagery	Based on Google Earth aerial imagery
Upper Slate Creek (USC)	Control	No	Based on Google Earth aerial imagery	Based on Google Earth aerial imagery
Mine Creek (MC)	Control	No	Based on Google Earth aerial imagery	Based on Google Earth aerial imagery
Below Saddlebag (BS)	Test	No	Based on field survey; dominated by gray-leaved Sierra willow (<i>Salix orestera</i>)	Community not present

Study Site	Control/Test-Influenced	Affected by Hydro-Resource Optimization	Willow Riparian Scrub Vegetation Determination	Wet Meadow Vegetation Determination
Upper Lee Vining (ULV)	Test	No	Based on field survey; mix of Sierra willow (<i>Salix eastwoodiae</i>), tea-leaved willow (<i>Salix planifolia</i>), Jepson's willow (<i>Salix jepsonii</i>), and gray-leaved Sierra willow	Based on field survey; dominated by a mix of grasses and forbs, including Pacific onion (<i>Allium validum</i>), alpine ragwort (<i>Packera pauciflora</i>), sedges (<i>Carex</i> spp.), and rushes (<i>Juncus</i> spp.)
Middle Lee Vining (MLV)	Test	No	Based on Google Earth aerial imagery	Based on Google Earth aerial imagery
Below Ellery (BE)	Test	No	Based on field survey; dominated by gray-leaved Sierra willow	Community not present
Lower Lee Vining (LLV)	Test	Yes	Based on field survey; dominated by narrow-leaved willow (<i>Salix exigua</i>)	Based on field survey; dominated by sedges (<i>Carex</i> spp.) and rushes (<i>Juncus</i> spp.)

Source: Google Earth, various dates

NDVI = Normalized Difference Vegetation Index

3.0 METHODS

Study implementation generally followed the methods described in the *TERR-1 General Botanical Resources Survey Technical Study Plan*, with the exceptions described below.

3.1. MODIFICATIONS TO METHODS

Study TERR-1 originally proposed two study sites to determine whether changes were detected in riparian “health” as a result of hydro-resource optimization, as measured by NDVI. The current study expanded the analysis to eight study sites: five test reaches of Lee Vining Creek downstream of Project facilities and three outside the Project to act as controls. These additional study sites allow for an increase in sampling replicates and a more robust analysis.

Select portions of the Botanical Resources Study Area were extended beyond 100 feet at the request of the USFS (i.e., the portion of Lee Vining Creek below Saddlebag Dam and the lakeshore around the Saddlebag Day Use Picnic/Fishing Site) for the purpose of gathering more extensive data along the creek.

In some locations, the Botanical Resources Study Area buffer was decreased within 100 feet due to limitations of accessibility and topography.

An upland area (i.e., access road) below Saddlebag Dam was included in the 2023 surveys at the request of the USFS.

Some areas previously surveyed in 2022 were inaccessible for early 2023 surveys due to higher water levels (e.g., the lakeshore around Saddlebag Lake, the left bank of Lee Vining Creek below Saddlebag Dam, and the active channel at Poole Powerhouse), persistent snowpack (e.g., the end of Penstock Trail and a portion of the Tioga Dam study area), or the presence of Yosemite toad (i.e., the eastern end of the Saddlebag Dam and Campgrounds study area). The end of the Penstock Trail was accessible and surveyed during the second round of 2023 surveys; however, other areas were still below water or snow. The eastern end of the Saddlebag Dam and Campgrounds study area was viewed from the edge of the meadow in order to avoid incidental effects on Yosemite toadlets and adults present at the time of the surveys.

In place of reference population checks, two rounds of surveys were performed in 2022 and 2023 to ensure coverage of the blooming periods for all species.

3.2. VEGETATION MAPPING

3.2.1. LITERATURE REVIEW

The original vegetation map was obtained from the USFS (USFS, 2020a). Keys and descriptions followed the CALVEG (Classification and Assessment with Landsat of Visible Ecological Groupings) classification system (USFS, 2009). This is the preferred key to the Inyo National Forest and is used for consistency with the Inyo National Forest Plan (USFS, 2019). The Botanical Resources Study Area occurs in the South Sierran mapping zone.

3.2.2. FIELD SURVEY

Surveys were conducted by Psomas Senior Botanist Allison Rudalevige and Consulting Senior Botanist Sandra Leatherman. Vegetation mapping surveys were performed in 2022 and occurred on July 18, 19, 20, 21, and 22 and August 15, 16, 17, 18, and 19, 2022. A field map with the Botanical Resources Study Area and the original USFS vegetation map was overlaid on aerial imagery (USGS, 2020) and was prepared at a scale of 1 inch equals 150 feet (1"=150'). Canopy cover and dominant plant species were assessed within the study area to determine if ground-truthed vegetation was consistent with the USFS vegetation classification. Given the relatively small size of the various portions of the study area, vegetation was mapped at a scale to enable habitat (i.e., vegetated areas) to be distinguished from non-habitat (i.e., unvegetated and developed areas) and small areas of sensitive vegetation communities or habitats for special-status plant species to be identified.

3.3. SPECIAL-STATUS PLANT SPECIES SURVEY

3.3.1. LITERATURE REVIEW

A literature review was conducted to identify special-status plant species reported to occur (or that historically occurred) in the vicinity of the Botanical Resources Study Area. This literature review also verified the protective status of any of the previously identified special-status plants and reviewed any new literature on the ecology and life history of these resources. The literature review was used to define potentially suitable habitat for special-status plant species and make a determination on which species have potential to occur in the Botanical Resources Study Area based on the presence of suitable habitat.

A list of special-status plant species was compiled from several sources by searching the following U.S. Geological Survey (USGS) 7.5-minute topographic quadrangles: Tioga Pass, Mount Dana, Lee Vining, Falls Ridge, Lundy, Dunderberg Peak, Vogelsang Peak, Koip Peak, Matterhorn Peak, and Tenaya Lake.

The sources queried included:

- California Natural Diversity Database (CNDDDB; CDFW, 2020)
- California Native Plant Society's Inventory of Rare and Endangered Plants (CNPS, 2020)
- Persistence Analysis for Species of Conservation Concern Inyo National Forest (INF, 2019) (species known to be present in the Mono Ranger District are included)
- USFS records of botany at risk species (NRM – TESP/IS, 2018)
- Whitebark pine range geospatial data (USFS, 2020b)

The literature review yielded a total of 135 special-status plant species reported from the vicinity of the Botanical Resources Study Area as shown in Table B-1 of Appendix B, Literature Review Results, to this technical report. Species listed in the table are categorized as known to occur, may occur, or unlikely to occur. The table also summarizes pertinent information for each species, including listing status, blooming period, and preferred habitat, with information on the location of occurrences recorded within the Botanical Resources Study Area.

A soil map was prepared to assist in determining whether soils suitable for special-status plant species occur in the Botanical Resources Study Area (Appendix A).

3.3.2. FIELD SURVEY

Special-status plant surveys were floristic in nature and consistent with the *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities* (CDFW, 2018). Surveys were performed at appropriate times of year to maximize the probability of detecting special-status plant species, as

determined by the literature review and in consultation with the relevant Stakeholders. Two rounds of surveys were conducted each year (2022 and 2023) to encompass the blooming/fruitlet period for multiple special-status plant species. Two years of surveys were performed to maximize the chance of detecting special-status plant species.

Surveys were conducted by Psomas Senior Botanist Allison Rudalevige, and Consulting Senior Botanist Sandra Leatherman. In 2022, surveys were performed on July 18, 19, 20, 21, and 22 and August 15, 16, 17, 18, and 19, 2022. In 2023, surveys were performed on July 24, 25, 26, and 27 and August 18, 19, 20, and 22, 2023. The total number of person-hours spent surveying was approximately 110 hours in 2022 and 85 hours in 2023. A systematic, pedestrian survey was conducted throughout the Botanical Resources Study Area in all areas of suitable plant habitat. Inaccessible areas were viewed via binoculars. A field map with the Botanical Resources Study Area overlaid on aerial imagery (USGS, 2020) was prepared at a scale of 1 inch equals 150 feet (1"=150').

Plant species were identified in the field or collected for future identification. At the time of this technical report, voucher specimens are in the process of being deposited in an approved herbarium that is a member of the Consortium of California Herbaria (i.e., at the University of California, Riverside, and the California Botanic Garden). Individuals were collected under the conditions of California Department of Fish and Wildlife (CDFW) and USFS permits.

Plants were identified to the taxonomic level necessary to determine whether they were a special-status species. Identification was made using taxonomic keys, descriptions, and illustrations in Jepson Flora Project (2022), Wilson et al. (2014), Hurd et al. (1998), Wiese (2013), and Breckling and Breckling (2020). Nomenclature of plant taxa conform to the *Special Vascular Plants, Bryophytes, and Lichens List* (CDFW, 2022) for special-status species and the Jepson eFlora (Jepson Flora Project, 2022) for all other taxa.

The location of any special-status plant species population observed in the Botanical Resources Study Area was recorded with either a handheld Garmin Global Positioning System (GPS) unit or on an iPad loaded with Avenza Maps software displaying the field map. Horizontal mapping accuracy ranged from approximately 10 to 30 feet. The number of individuals was collected for non-clonal species (estimated for large populations) and the area and percent cover was mapped for clonal species. Data were collected on the phenology of individuals and microsite characteristics (e.g., slope, aspect, soil texture, surrounding habitat, and associated species). At the request of the resource agencies, locations of black cottonwood (*Populus trichocarpa*) were also recorded. CNDDDB Field Survey Forms will be submitted to the CDFW for species with a CRPR of 1 or 2 and are included in Appendix C.

3.4. INVASIVE PLANT SPECIES SURVEY

3.4.1. LITERATURE REVIEW

The list of invasive plant species with potential to occur in the Botanical Resources Study Area was developed from a query of the Cal-IPC (Cal-IPC, 2020) and a list provided by the USFS of non-native invasive plants (NNIPs) currently known in the Inyo National Forest (NRM – TESP/IS, 2018).

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

- **Jepson region:** The inventory uses geographic floristic provinces and subdivisions within California as described by the Jepson Flora Project (2022); Sierra Nevada East was used.
- **Habitat types:** Five vegetation communities were known to be in or near the Botanical Resources Study Area and were selected: scrub and chaparral, grasslands, riparian, woodland, and forest.

Cal-IPC defines NNIPs as plants that (1) are not native to, yet can spread into, wildland ecosystems, and that also (2) displace native species, hybridize with native species, alter biological communities, or alter ecosystem processes (Cal-IPC, 2020).

Cal-IPC categorizes plants as High, Moderate, or Limited, according to the degree of ecological effect in California (Cal-IPC, 2020):

- **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 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 NNIPs into various treatment strategies: (1) eradicate, (2) control, (3) contain, and (4) limited or no treatment.

The Cal-IPC query combined with the list of NNIPs known to occur in the Inyo National Forest yielded a total of 84 invasive plant species that have the potential to occur in the Botanical Resources Study Area as shown in Table B-2 of Appendix B, Literature Review Results, to this technical report.

3.4.2. FIELD SURVEY

Invasive plant species surveys were performed concurrently with and followed the methods for special-status plant surveys, as described above.

Plant species were identified in the field or collected for future identification. Voucher specimens will be deposited in an approved herbarium that is a member of the Consortium of California Herbaria (i.e., at the University of California, Riverside, and the California Botanic Garden). Individuals were collected under the conditions of USFS Forest Product Free Use Permit OMB No. 0596-0085, held by Ms. Rudalevige.

The USFS identified select invasive species of concern to be mapped within the Botanical Resources Study Area. This includes all species on the Inyo National Forest Invasive Plant Inventory Database with a treatment strategy of (1) eradicate or (2) control and select species with a treatment strategy of (3) contain (see Table B-3 in Appendix B, Literature Review Results, of this technical report). Discrete individuals/populations were mapped as a point or a polygon. Widely distributed species dispersed throughout a study site were documented as present/absent in individual study sites. The number of individuals of each invasive species was estimated. Other non-native plant species observed were documented as present but not mapped.

3.5. RIPARIAN MONITORING STUDY

The following is a summary of riparian monitoring methods performed as part of the previous license agreement. A complete description of methods can be found in Read (2004, 2012, 2017, and 2022). Herbaceous data were collected in 1-meter 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 3-meter-wide transect belts. Parameters collected for each tree or shrub species included location within the belt, canopy cover, height, and size class.

3.6. NDVI ANALYSIS

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 10 square meters 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 as part of the long-term riparian monitoring study.

An 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 powerhouse in Lee Vining. Pixel resolution of the imagery was approximately 12 centimeters for aeriels flown in 2021 and 15 centimeters for aeriels 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.

4.0 RESULTS

4.1. VEGETATION MAPPING

Thirteen vegetation communities and other areas were identified in 2022 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.

4.1.1. 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).

4.1.2. 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.

4.1.3. 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.

4.1.4. 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 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 4.2.1 below), this area may be considered a sensitive natural community. However, the area is inundated when reservoir levels are normal.

4.1.5. 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).

4.1.6. 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).

4.1.7. 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.

4.1.8. 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-leaved Sierra willow (*Salix orestera*) and bitter cherry (*Prunus emarginata*).

The *Populus tremuloides* Association is considered a sensitive natural community by the CDFW (2023).

4.1.9. 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.

4.1.10. 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. 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 Endangered Species Act, this vegetation type could be considered sensitive.

4.1.11. 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. A relatively small amount of lodgepole pine is also present. 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.

4.1.12. 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.

4.1.13. 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-leaved 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-leaved willow would not be considered sensitive.

4.2. SPECIAL-STATUS PLANT SPECIES

Two special-status plant species tracked by the CNDDDB were observed in 2022 and 2023 in the Botanical Resources Study Area: mountain bent grass and whitebark pine. Appendix A shows the location of each population of special-status plant species. At the request of the resource agencies, information was also collected on black cottonwood. 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 Appendix D, Plant Compendium.

4.2.1. MOUNTAIN BENT GRASS

Mountain bent grass has a CRPR of 2B.3 and is designated as a Species of Conservation Concern 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 above mean sea level (amsl) (Jepson Flora Project, 2020, 2022; 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, 2020, 2022).

4.2.1.1. 2022 Results

Five populations of mountain bent grass totaling approximately 854 individuals were observed in the Botanical Resources Study Area (Appendix A; Table 4.2-1). The majority of individuals were flowering or fruiting. Populations were observed in the Saddlebag Dam and Campgrounds portion of the study area. The species was growing in relatively barren areas along the lakeshore and below Saddlebag Dam, sometimes among scattered boulders and cobbles. 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 4.2-1. 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

4.2.1.2. 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.

4.2.2. WHITEBARK PINE

Whitebark pine is listed as Threatened under the federal Endangered Species Act and is designated as a Species of Conservation Concern by the Inyo National Forest. Federal listing was finalized on December 15, 2022, effective January 17, 2023 (USFWS, 2022). 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, 2020). 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.

4.2.2.1. 2022 Results

Twenty-four populations of whitebark pine totaling approximately 1,069 individuals were observed in the Botanical Resources Study Area (Appendix A; Table 4.2-2). Populations were observed in the Rhinedollar Dam and Penstock Trail, Saddlebag Dam and

Campgrounds, Ellery Lake Campground, Sawmill Campground, Tioga Dam and Auxiliary Dam, and Tioga Lake Campground portions of the study area. Populations 1 through 17 were documented in 2022. The species was observed in several vegetation types including whitebark pine forest, whitebark pine – alpine, willow scrub, and wet meadow. Associated species vary by site and include lodgepole pine, gray-leafed Sierra willow, Brewer’s mountain heather (*Phyllodoce breweri*), western Labrador tea (*Rhododendron columbianum*), whitestem goldenbush (*Ericameria discoidea*), dwarf bilberry, fireweed, compact spear phacelia, Newberry’s beardtongue, squirreltail, Sierra beardtongue, frosted wild buckwheat (*Eriogonum incanum*), and thread-leaved sedge (*Carex filifolia*).

4.2.2.2. 2023 Results

Populations 1 through 17, initially documented in 2022, were confirmed in 2023. Populations 18 through 24 were documented in 2023.

Table 4.2-2. Population Counts and Phenology of Whitebark Pine in 2022 and 2023

Botanical Study Area	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
Saddlebag Dam and Campgrounds	7	30	85	15
	8	200	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
Tioga Lake Campground	15	6	17	83
	16	9	55	45
	17	13	85	15

Botanical Study Area	Population	Number of Individuals	Percent Vegetative	Percent Flowering/Fruiting
Saddlebag Dam and Campgrounds	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

4.2.3. 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 30 meters tall (Jepson Flora Project, 2020). It occurs in alluvial bottomland and stream sides and elevations between approximately 16 and 10,007 meters amsl. In California, it is known throughout the California Floristic Province and the Great Basin.

4.2.3.1. 2022 Results

Three populations of black cottonwood were observed in the Botanical Resources Study Area, all within the Poole Powerhouse area (Appendix A; Table 4.2-3). Population 1 consisted of two, mature individuals. Both individuals appeared healthy. Population 2 consisted of a cluster of eight saplings, all appearing healthy.

4.2.3.2. 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, 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 4.2-3. 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

4.3. INVASIVE PLANT SPECIES

One invasive plant 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, 2020). 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, 2020; Kelch, 2015). It has a USFS treatment strategy of 3 (Contain) and a Cal-IPC rating of “high.”

4.3.1. 2022 RESULTS

Three populations of cheat grass were observed in 2022 in the Botanical Resources Study Area (the associated mapbook in Appendix A). 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 invasive plant species of concern were observed in the study area. Other non-native plant species observed are reported in Appendix D, Plant Compendium.

4.3.2. 2023 RESULTS

Two additional populations of cheat grass were observed in 2023 (Appendix A). Both of these were documented near Poole Powerhouse (Population 4 has 5 individuals; Population 5 has 10 individuals).

4.4. RIPARIAN MONITORING STUDY

Baseline surveys were repeated over 3 years (1999, 2000, and 2001) and long-term monitoring was performed over the next 20 years in 2006, 2011, 2016, and 2021 under the current license.

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 in 2000 and to a low of 28 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 to be 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).

4.5. NDVI ANALYSIS

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 4.5-1 and Figure 4.5-1 summarize 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 4.5-2 and Figure 4.5-2 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 4.5-1. Summary of NDVI 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; USC = Upper Slate Creek; MC = Mine Creek; BS = Below Saddlebag; ULV = Upper Lee Vining; MLV = Middle Lee Vining; BE = Below Ellery; LLV = Lower Lee Vining

^a Site names in italics are control sites; site names not in italics are test sites.

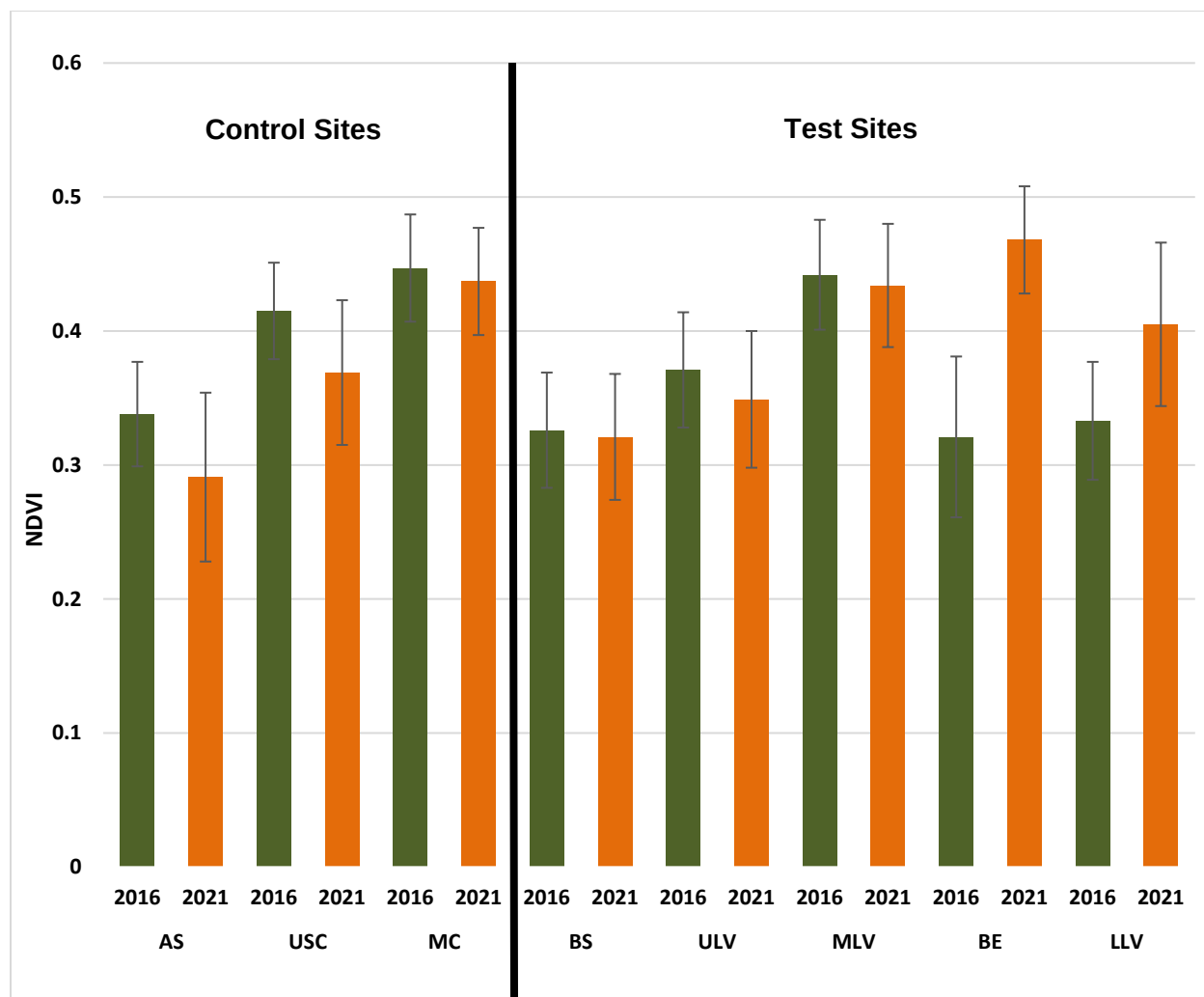


Figure 4.5-1. Mean NDVI (+/- Standard Deviation) for Control and Test Willow Riparian Scrub.

Table 4.5-2. Summary of NDVI 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; USC = Upper Slate Creek; MC = Mine Creek; ULV = Upper Lee Vining; MLV = Middle Lee Vining; LLV = Lower Lee Vining; NDVI = Normalized Difference Vegetation Index

^a Site names in italics are control sites; site names not in italics are test sites.

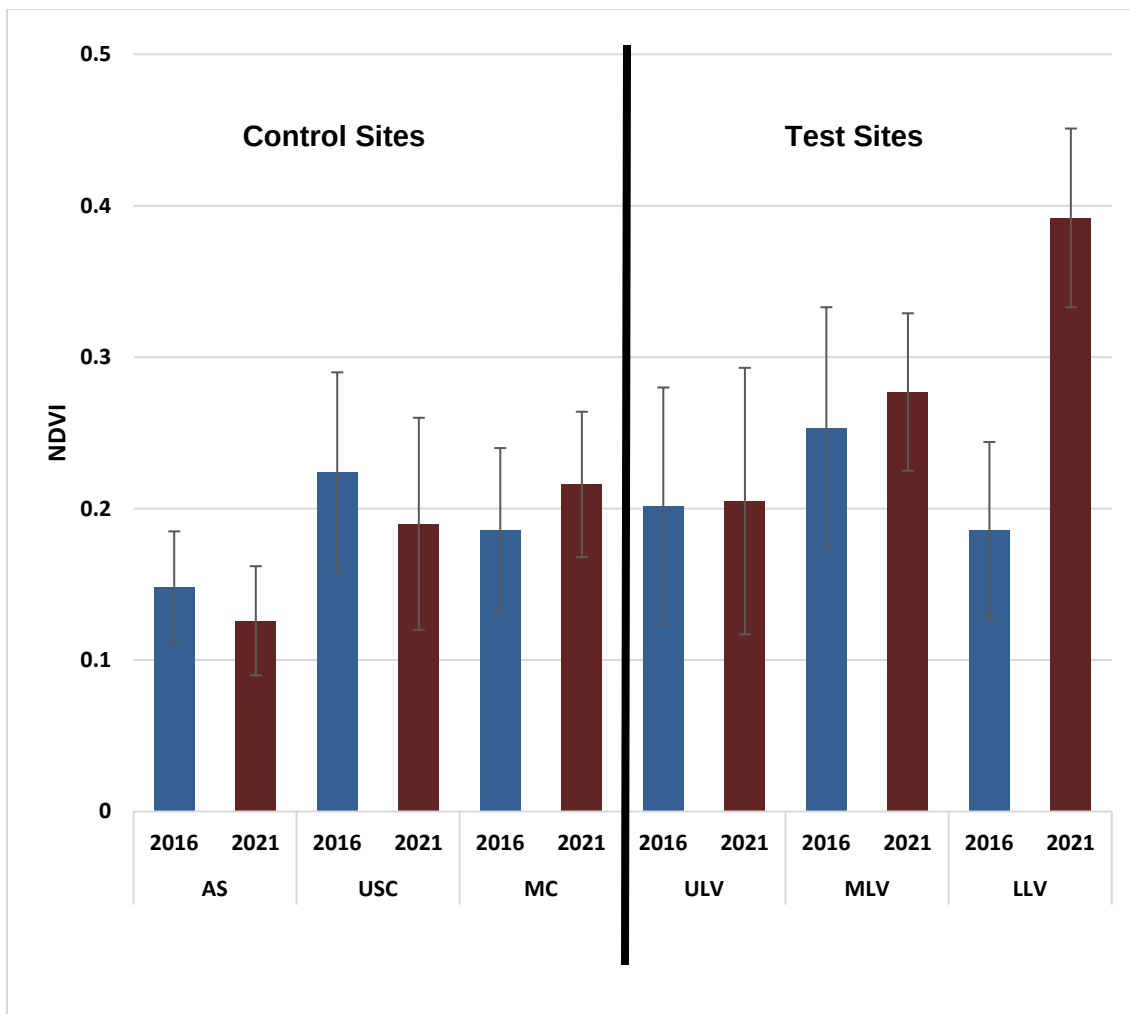


Figure 4.5-2. Mean NDVI for Control and Test Wet Meadow Habitat.

5.0 CONSULTATION SUMMARY

In preparation to file the Pre-Application Document and Notice of Intent filed in August 2021, SCE hosted Terrestrial and Botanical TWG meetings on January 27, February 24, April 7, and May 26, 2021. These TWG meetings resulted in study requests from Stakeholders to address questions regarding botanical resources. Notes and materials from these meetings are available on SCE's Project website (www.sce.com/leevining).

SCE filed draft Study Plans with the Pre-Application Document and Notice of Intent on August 12, 2021, to address issues discussed with the TWGs. The Stakeholder comment period for these filings ended on January 18, 2022. SCE reviewed all comments received and drafted Revised Technical Study Plans, which were distributed to the TWGs on February 18, 2022, for another 30-day review period. Stakeholder comments received on the Revised Technical Study Plans were reviewed and incorporated as appropriate in the Final Technical Study Plans, which were filed with FERC on April 25, 2022 (SCE, 2022). Vegetation mapping and Year 1 of the special-status plant and invasive plant species surveys were conducted in 2022. Year 2 of the special-status plant and invasive plant species surveys were conducted in 2023. Data collected in 2022 was analyzed and a Draft Technical Report was produced and distributed to Stakeholders for review in September 2023. Comments on the report were received from Stakeholders after a 60-day review, and are included in Table 5-1 below.

Draft Technical Reports were distributed to TWGs on April 16, 2024, for a 60-day comment period. On May 14, 2024, SCE held a public meeting at the Lee Vining Community Center to discuss the draft reports and study findings to date. On June 12, 2024, at the end of the comment period, comments were received from USFS, U.S. Fish and Wildlife Service, CDFW, State Water Resources Control Board, and Mono Lake Committee. All comments received related to the TERR-1 2023 Draft Technical Report are included in Table 1-1 in Volume III of the Draft License Application.

Table 5-1. Consultation Summary—Response to Comments

Comment Number	Entity	Date/Forum	Comment ^a	SCE Response
1	USFS	12/27/2023 Comments on 2022 Draft Technical Report	This letter is to comment on the technical surveys performed for the 2022 and 2023 period as required for the relicensing of the Southern California Edison hydroelectric facilities in the Lee Vining Creek drainage. The survey studies are: general botanical resources, water quality, stream fish populations, reservoir fish populations and hydrology operation modeling. For the Owens River watershed, the 2022 water year received a very low snowpack with a seasonal average of 40% and a precipitation average of 40% as well. The 2023 water year saw the largest recorded snowpack in recorded history with a seasonal average of 266% and a seasonal precipitation average of 161%. For seasonal snowpack this a drastic change of approximately 565% between the two years and a 300% change for seasonal precipitation. The hydroelectric license is for a 30-year period and with only these two years of data collection guiding the relicensing process, anomalous weather events could skew what is already a limited dataset and provide a flawed basis for management decisions. A similar situation occurred with Colorado River water flows, when past allocation decisions were based on very high flow years. We are concerned that a similar situation could unfold given that these survey studies are based on two years of data collection, with one of those years being the extreme winter of 2022-2023. For this reason, we would like to see at least one more year of data collection for the relicensing process.	SCE believes we have collected adequate information to assess potential Project effects and do not believe an additional study year is warranted. 2023 may have had higher than average precipitation; however, global climate trends indicate increasingly erratic and unpredictable weather events, so an additional 2024 study year may not be a truly "normal" year either. Special-status species were identified in both a dry year and a wet year. Future O&M activities resulting in vegetation removal/ground disturbance over the new license term would be addressed in the Vegetation Management Plan, which may include additional survey(s). Given stochasticity in plant population sizes, a PME addressing potential future threats may be more appropriate than a third consecutive year of plant surveys.

Comment Number	Entity	Date/Forum	Comment ^a	SCE Response
2	CDFW	11/22/2023 Comments on 2022 Draft Technical Report	Comment: The CNPS identifies that mountain bent grass (<i>Agrostis humilis</i>) (California Rare Plant Rank 2B.3-rare, threatened or endangered in California) is threatened by foot traffic and vehicles and possibly threatened by grazing and trampling. SCE should identify the potential for these threats and any other threats (e.g., maintenance activities) at each population location to determine the vulnerability, condition of occurrences, and if PME measures are needed (e.g., signage, fencing) to protect the plant.	SCE will discuss potential threats to mountain bent grass populations in the DLA. PME measures will be included in the DLA for mountain bent grass, if appropriate.
3	CDFW	11/22/2023 Comments on 2022 Draft Technical Report	Comment: On January 14th, 2022, CDFW proposed a Riparian Monitoring and Community Health Study. SCE responded that 'sufficient data exists from ongoing Riparian Monitoring Evaluations conducted as part of the license'. SCE has shared with CDFW via email various Riparian Reports associated with the existing FERC License requirements; however, these reports should be made available for review on the Projects relicensing website. Additionally, SCE responded in the Revised Technical Study Plans that raw data would be provided to the TWG. This data should also be made available on the Projects relicensing website. All existing available data that SCE produced as part of the license (e.g., riparian monitoring and evaluations) should be made available for review. Providing this data later with the DLA will not provide stakeholders sufficient time to review the data in a meaningful way.	SCE provided historic riparian reports and other relevant existing data to interested Stakeholders when requested. If additional Stakeholders would like this information, SCE can provide it. However, SCE does not intend to provide these reports and data on the website.

Comment Number	Entity	Date/Forum	Comment ^a	SCE Response
4	CDFW	11/22/2023 Comments on 2022 Draft Technical Report	Comment: Much of the Botanical Resource study area is outside of the FERC Project area and is focused only around Project facilities or recreational areas. Question: Does sufficient data exist to provide a baseline of the distribution of special status plant species within the FERC Project area?	The Botanical Resources Study Area was determined in consultation with Stakeholders during several TWG meetings prior to the field studies. The study area was developed to address potential future O&M activities, which would occur around Project facilities. The studies were designed to document baseline conditions (i.e., Lee Vining Creek with flow conditions similar to that under the current license).
5	CDFW	11/22/2023 Comments on 2022 Draft Technical Report	CDFW requests the following spatial data be provided as shapefiles or geodatabase: Botanical Study Area boundary	Data will be provided with distribution of draft reports.
6	CDFW	11/22/2023 Comments on 2022 Draft Technical Report	CDFW requests the following spatial data be provided as shapefiles or geodatabase: NDVI: Sampling plots (wet meadow), Sampling plots (willow riparian scrub), Study Sites (Test), Study Sites (Control)	Data will be provided with distribution of draft reports.
7	CDFW	11/22/2023 Comments on 2022 Draft Technical Report	CDFW requests the following spatial data be provided as shapefiles or geodatabase: Special-status plant species populations	Data will be provided with distribution of draft reports.

CDFW = California Department of Fish and Wildlife; DLA = Draft License Application; FERC = Federal Energy Regulatory Commission; FS = Forest Service; ft = feet; GIS = geographic information system; INF = Inyo National Forest; NDVI = Normalized Difference Vegetation Index; O&M = operation and maintenance; PME = Protection, Mitigation, and Enhancement; RTSP = Revised Technical Study Plan; SCE = Southern California Edison; TWG = Technical Working Group; USFS = U.S. Forest Service; USGS = U.S. Geological Survey

^a Acronyms are used in comments that do not align with those used in this technical report: FS = Forest Service; ft = feet; INF = Inyo National Forest; RTSP = Revised Technical Study Plan

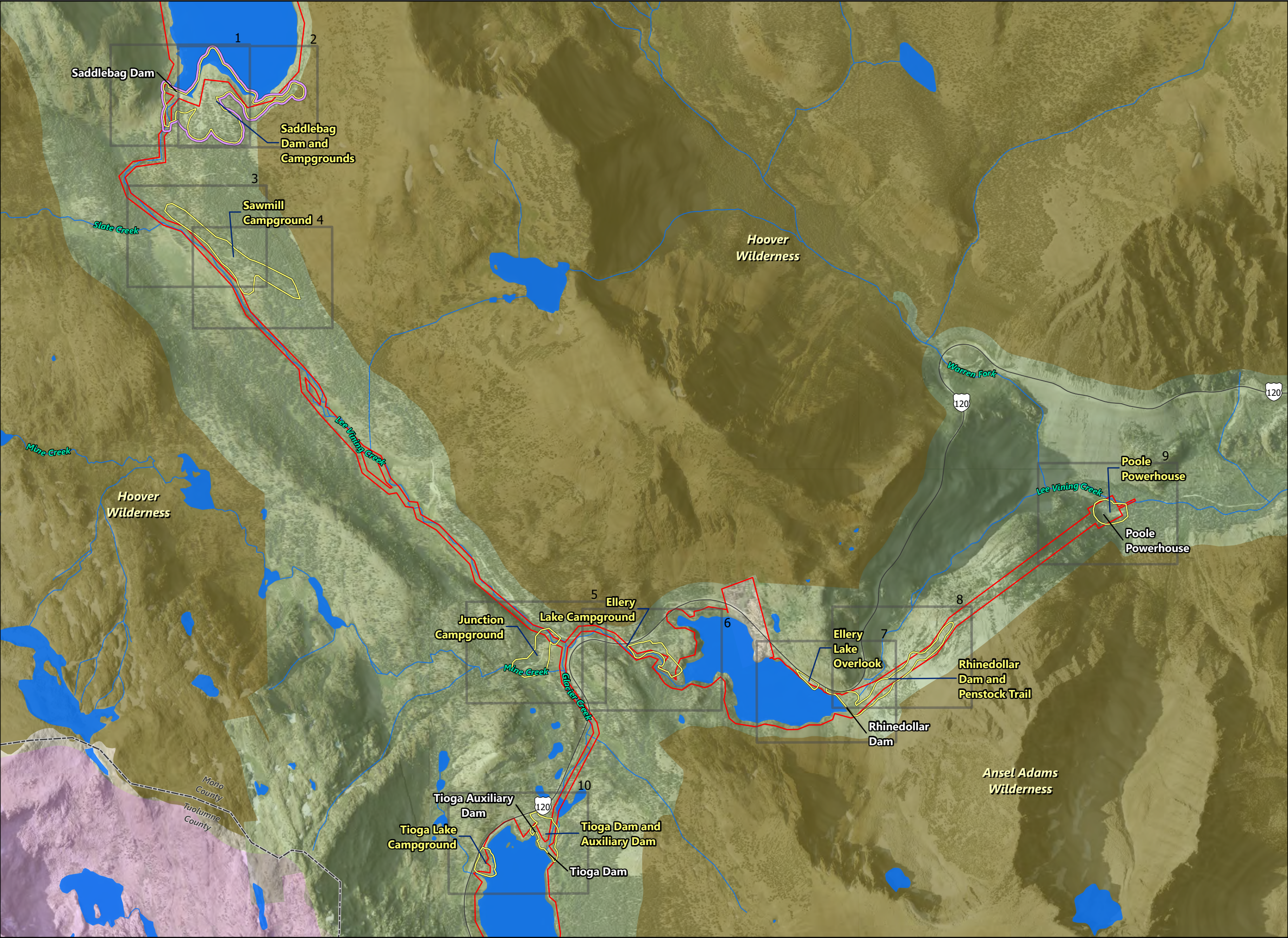
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APPENDIX A MAPBOOKS



- 2023 Study Area Modification
- 2022 Study Area
- Map Extents
- County Line
- FERC Project Boundary (P-1388)
- Wilderness Area (Inyo NF)
- Yosemite National Park
- Inyo National Forest



**Botanical Resources
Study Area**

**LEE VINING
HYDROELECTRIC PROJECT
FERC PROJECT NO. 1388**



N

Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983

0 1,000 2,000
Feet



- 2023 Study Area Modification
- 2022 Study Area
- Map Extents
- Facility
- FERC Project Boundary (P-1388)
- Waterbody
- Hydrography

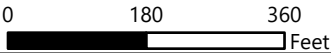
Base Imagery: NAIP 2020



**Botanical Resources
Study Area**

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HYDROELECTRIC PROJECT
FERC PROJECT NO. 1388**

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Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet
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- 2023 Study Area Modification
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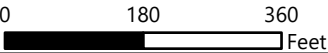
**Botanical Resources
Study Area**

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FERC PROJECT NO. 1388**



Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet
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Botanical Resources Study Area

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HYDROELECTRIC PROJECT
FERC PROJECT NO. 1388**

Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet
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0 180 360 Feet



- 2023 Study Area Modification
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Base Imagery: NAIP 2020



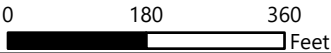
**Botanical Resources
Study Area**

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**LEE VINING
HYDROELECTRIC PROJECT
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Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet
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- 2023 Study Area Modification
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**Botanical Resources
Study Area**

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HYDROELECTRIC PROJECT
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- 2023 Study Area Modification
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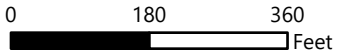
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**Botanical Resources
Study Area**

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HYDROELECTRIC PROJECT
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- 2023 Study Area Modification
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Botanical Resources Study Area

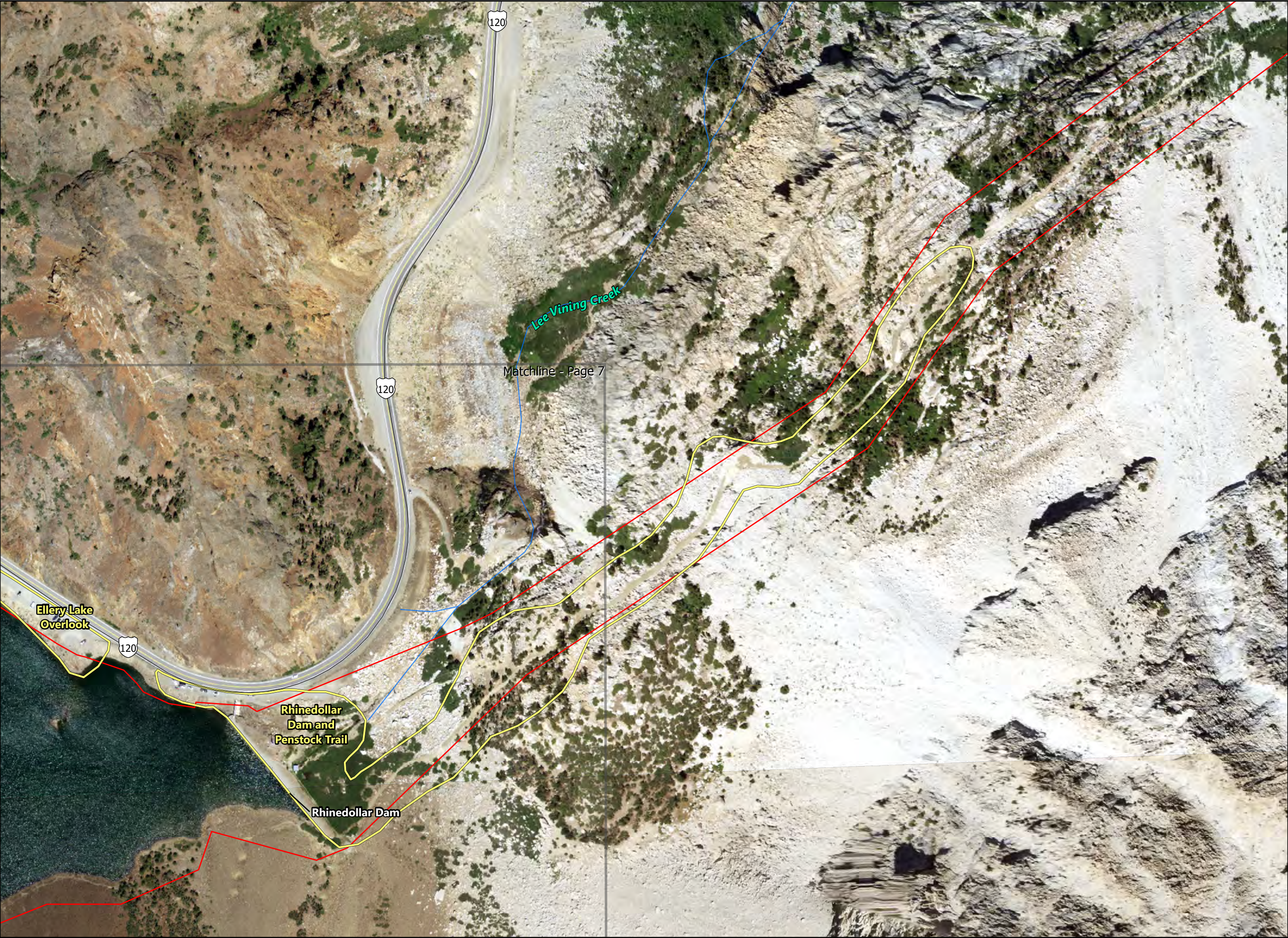
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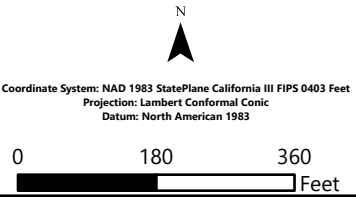
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**Botanical Resources
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Base Imagery: NAIP 2020



Botanical Resources Study Area

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Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet
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0 180 360 Feet



- 2023 Study Area Modification
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Base Imagery: NAIP 2020



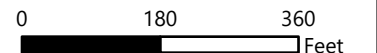
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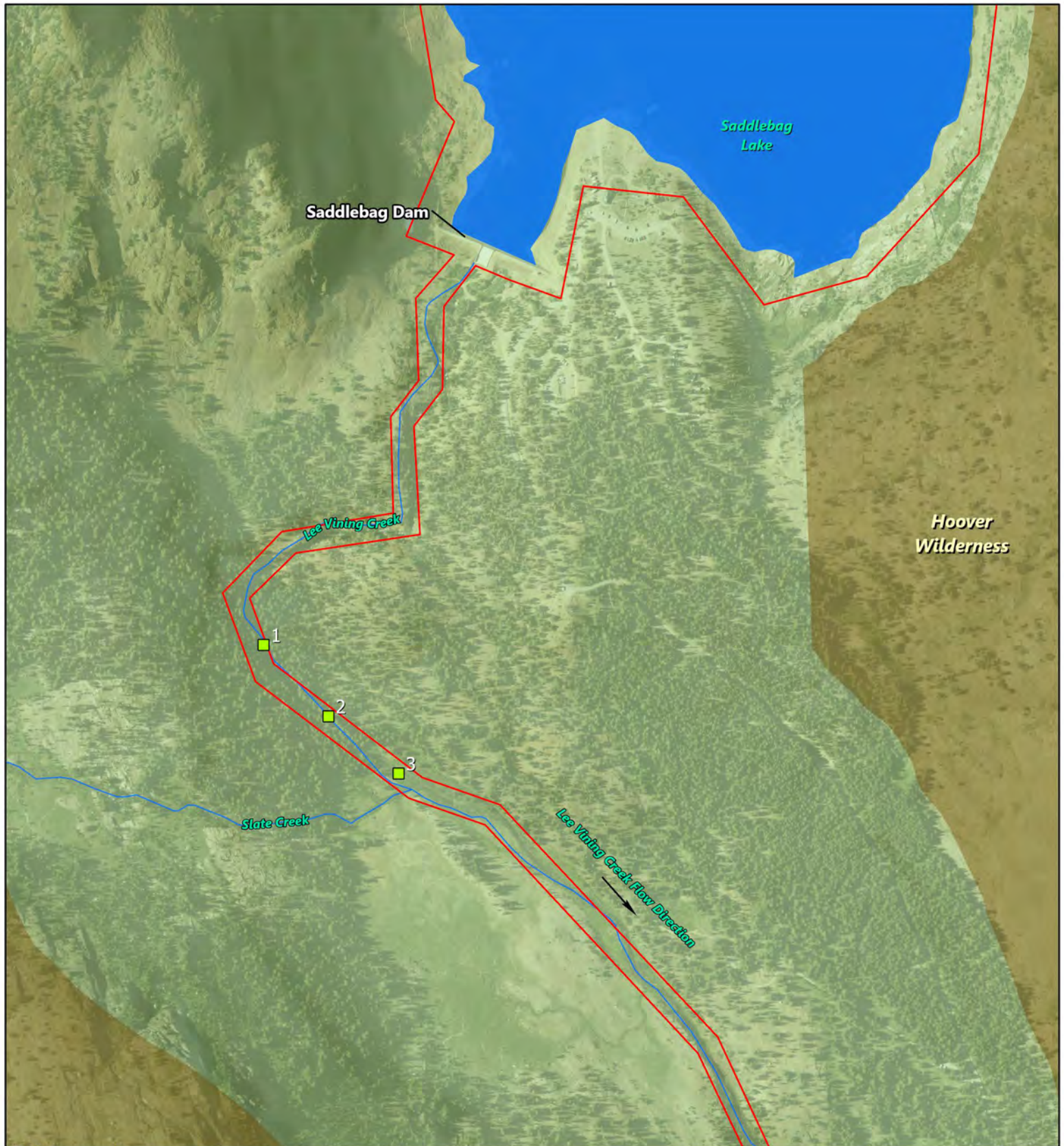
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HYDROELECTRIC PROJECT
FERC PROJECT NO. 1388



Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983





- Riparian Monitoring Study Sites
- ▬ FERC Project Boundary (P-1388)
- County Line
- Wilderness Area (Inyo NF)
- Inyo National Forest
- Yosemite National Park

The riparian monitoring study area consists of three study sites.



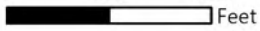
**SOUTHERN CALIFORNIA
EDISON**
Energy for What's Ahead™

N



Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983

0 300 600



Feet

Riparian Monitoring Study Sites

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HYDROELECTRIC PROJECT
FERC PROJECT NO. 1388**

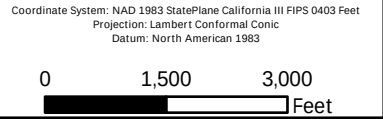


- Map Extents
- County Line
- FERC Project Boundary (P-1388)
- Stream Flowline
- Inyo National Forest
- Yosemite National Park



NDVI Study Area

LEE VINING
HYDROELECTRIC PROJECT
FERC PROJECT NO. 1388





Above Saddlebag Plot

- NDVI Plots
-  Sampling Plot - Wet Meadow
 -  Sampling Plot - Willow Riparian Scrub
- NDVI Study Sites
-  NDVI Study Site - Test
 -  NDVI Study Site - Control
 -  Stream Flowline
 -  Road
 -  FERC Project Boundary (P-1388)



NDVI Study Area

Below Saddlebag Plot



NDVI Plots

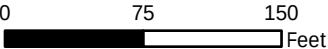
- Sampling Plot - Wet Meadow
- Sampling Plot - Willow Riparian Scrub

NDVI Study Sites

- NDVI Study Site - Test
- NDVI Study Site - Control
- Stream Flowline
- Road
- FERC Project Boundary (P-1388)



NDVI Study Area



Upper Slate Creek Plot

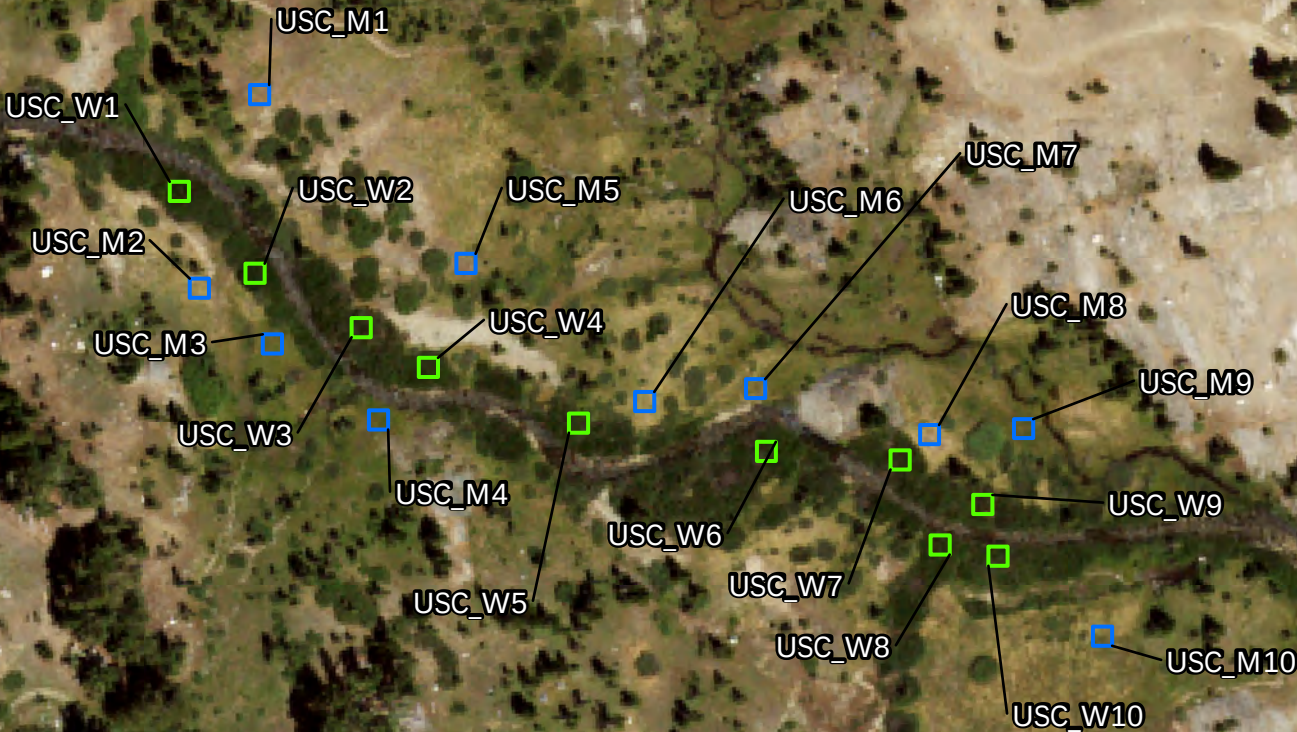
NDVI Plots

- Sampling Plot - Wet Meadow
- Sampling Plot - Willow Riparian Scrub

NDVI Study Sites

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- NDVI Study Site - Control
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Slate Creek

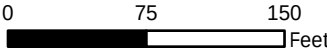


NDVI Study Area

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LEE VINING
HYDROELECTRIC PROJECT
FERC PROJECT NO. 1388

Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983



Upper Lee Vining Plot



NDVI Plots

-  Sampling Plot - Wet Meadow
-  Sampling Plot - Willow Riparian Scrub

NDVI Study Sites

-  NDVI Study Site - Test
-  NDVI Study Site - Control
-  Stream Flowline
-  Road
-  FERC Project Boundary (P-1388)



NDVI Study Area

Middle Lee Vining Plot



NDVI Plots

- Sampling Plot - Wet Meadow
- Sampling Plot - Willow Riparian Scrub

NDVI Study Sites

- NDVI Study Site - Test
- NDVI Study Site - Control
- Stream Flowline
- Road
- FERC Project Boundary (P-1388)



NDVI Study Area



- NDVI Plots
- Sampling Plot - Wet Meadow
 - Sampling Plot - Willow Riparian Scrub
- NDVI Study Sites
- NDVI Study Site - Test
 - NDVI Study Site - Control
 - Stream Flowline
 - Road
 - FERC Project Boundary (P-1388)



NDVI Study Area



Below Ellery Plot

NDVI Plots

-  Sampling Plot - Wet Meadow
-  Sampling Plot - Willow Riparian Scrub

NDVI Study Sites

-  NDVI Study Site - Test
-  NDVI Study Site - Control
-  Stream Flowline
-  Road
-  FERC Project Boundary (P-1388)

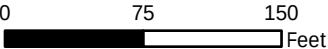


NDVI Study Area

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FERC PROJECT NO. 1388

Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983



Lower Lee Vining Plot



NDVI Plots

- Sampling Plot - Wet Meadow
- Sampling Plot - Willow Riparian Scrub

NDVI Study Sites

- NDVI Study Site - Test
- NDVI Study Site - Control
- Stream Flowline
- Road
- FERC Project Boundary (P-1388)

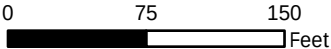


NDVI Study Area

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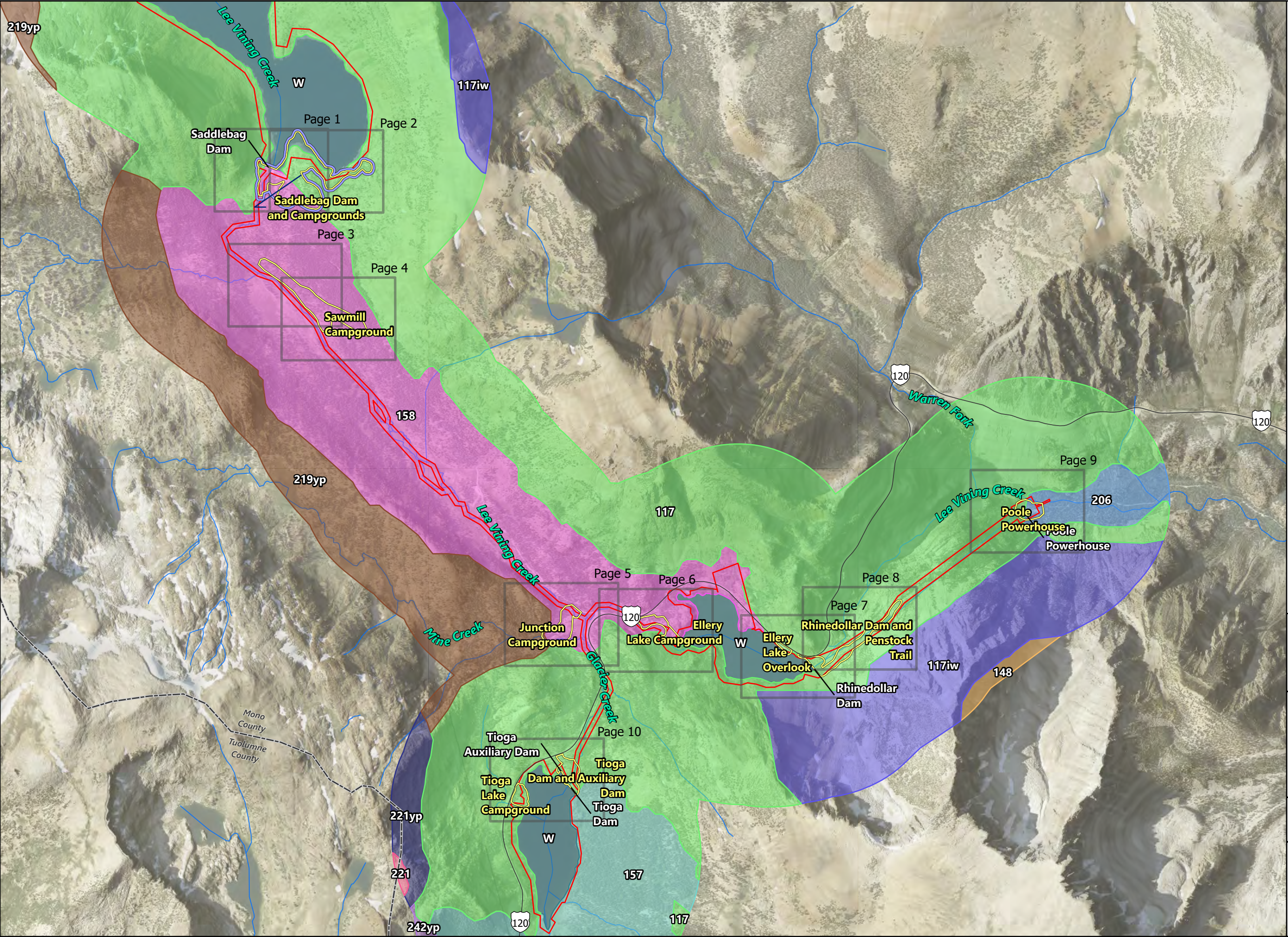
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Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet
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NRCS Soil Type Key

Map Unit Symbol	Map Unit Name
114	Typic Cryorthents-Rock outcrop complex, 0 to 45 percent slopes
117	Rock outcrop-Rubble land complex (published 1998)
117iw	Rock outcrop-Rubble land complex (published 1996)
148	Rock outcrop-Typic Cryorthents complex, 40 to 85 percent slopes
157	Stecum-Guiser families-Rock outcrop complex, 15 to 60 percent slopes.
158	Stecum-Charcol familes-Rock outcrop complex, 30 to 70 percent slopes.
206	Stecum-Chacol families-Rock outcrop association, 2 to 50 percent slopes.
210yp	Rubble land-Typic Cryorthents-Rock outcrop-Xeric Dystrocryepts complex, 30 to 80 percent slopes, mountainflanks, metamorphic, mafic, cryic
219yp	Rock outcrop-Rubble land-Canisrocks association, 0 to 80 percent slopes, cirqued mountainflanks, cryic
221	Typic Cryorthents-Xeric Dystrocryepts-Oxyaquic Dystrocryepts complex, 15 to 45 percent slopes, metamorphic, mountain slopes, lateral moraines, cryic (published 2006)
221yp	Typic Cryorthents-Xeric Dystrocryepts-Oxyaquic Dystrocryepts complex, 15 to 45 percent slopes, metamorphic, mountain slopes, lateral moraines, cryic (published 1998)
228yp	Xeric Dystrocryepts-Vitrandid Eutrocryepts complex, 0 to 15 percent slopes, wet/dry meadows, cryic
242yp	Rock outcrop-Canisrocks-Xeric Dystrocryepts complex, 0 to 35 percent slopes, mountain slopes, cryic
W	Water



Map Extents

2023 Study Area Modification

Study Area

County Line

FERC Project Boundary (P-1388)

Hydrography

NRCS Soils Type

114

117

117iw

148

157

158

206

210yp

219yp

221

221yp

228yp

242yp

W

SOUTHERN CALIFORNIA
EDISON
Energy for What's AheadSM

Soil Types

LEE VINING
HYDROELECTRIC PROJECT
FERC PROJECT NO. 1388

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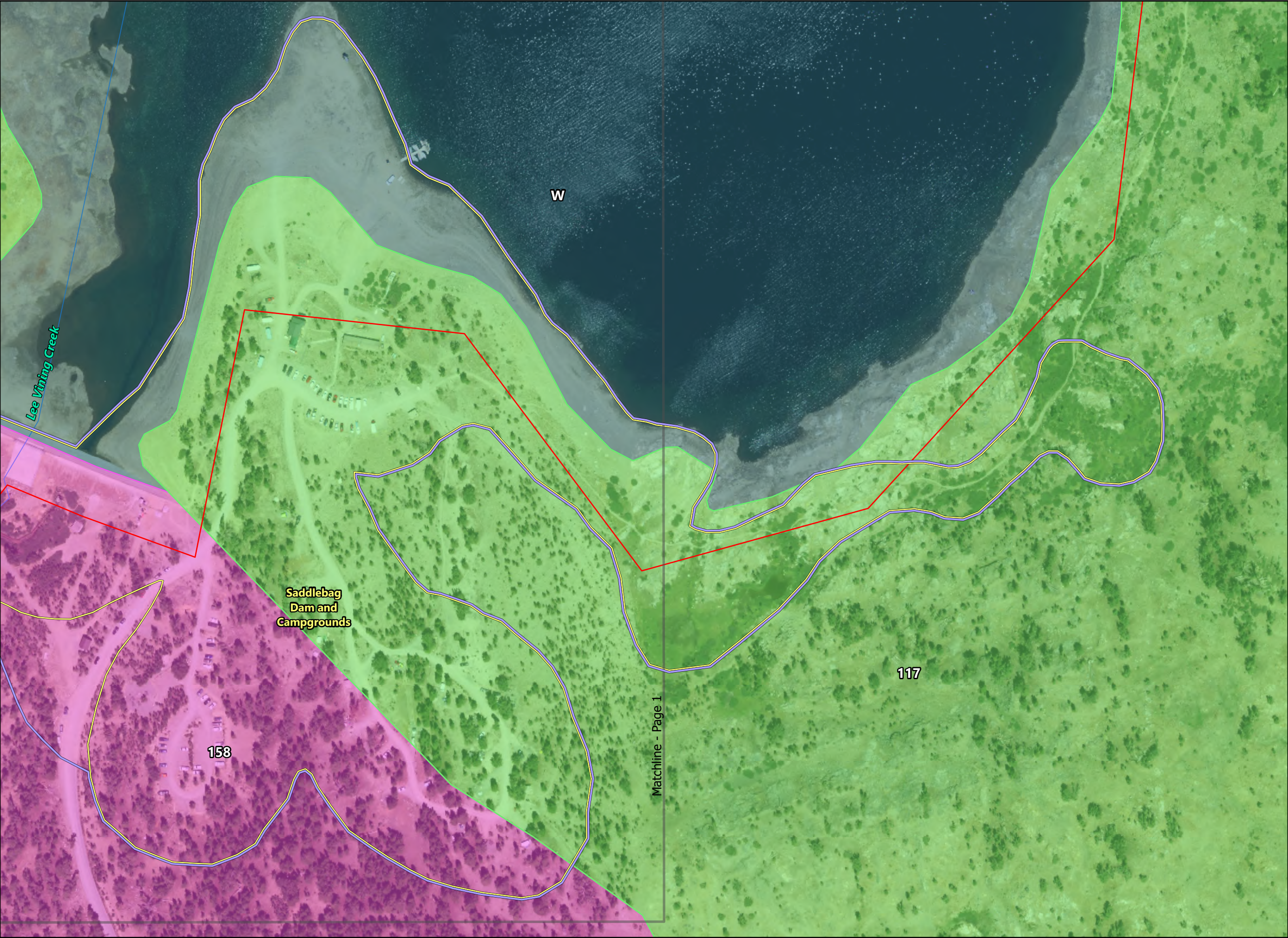
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0

1,250

2,500

Feet



- Map Extents
- 2023 Study Area Modification
- Study Area
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- FERC Project Boundary (P-1388)
- Hydrography
- NRCS Soils Type
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Base Imagery: NAIP 2020



**SOUTHERN CALIFORNIA
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Soil Types

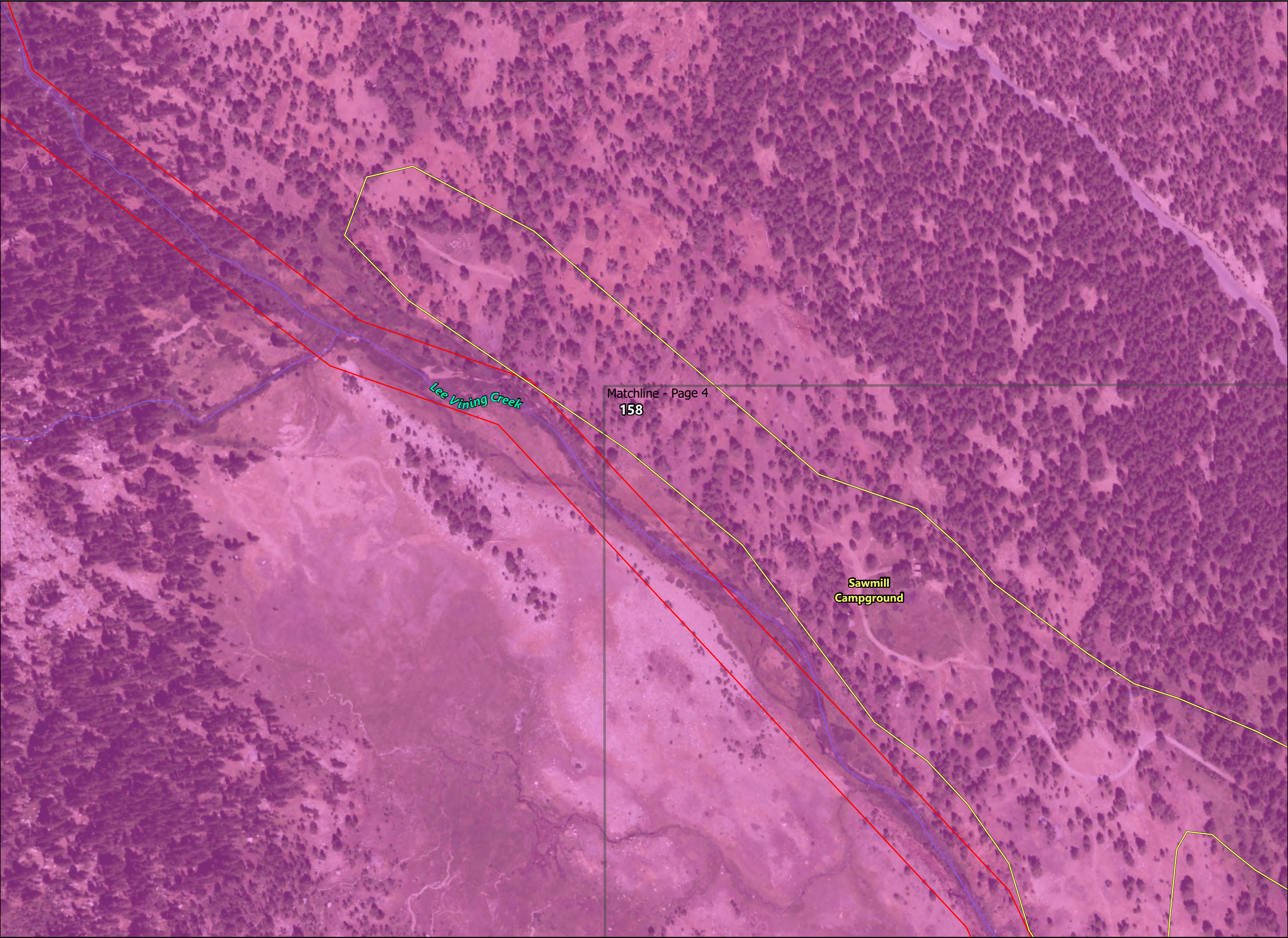
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HYDROELECTRIC PROJECT
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Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet
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Datum: North American 1983

0 125 250 Feet



- Map Extents
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Base Imagery: NAIP 2020



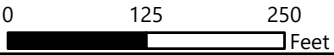
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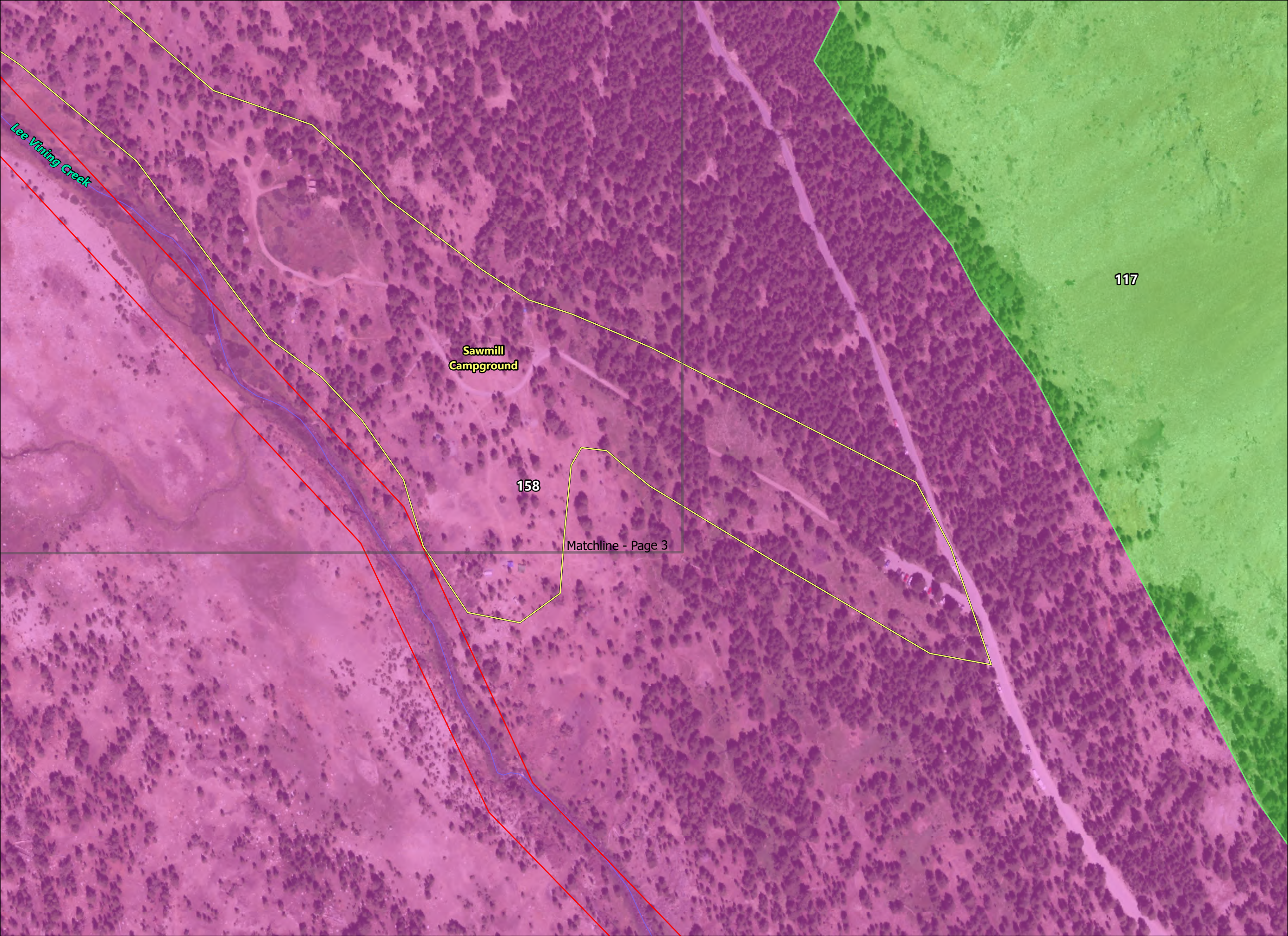
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LEE VINING
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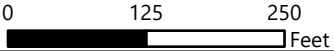
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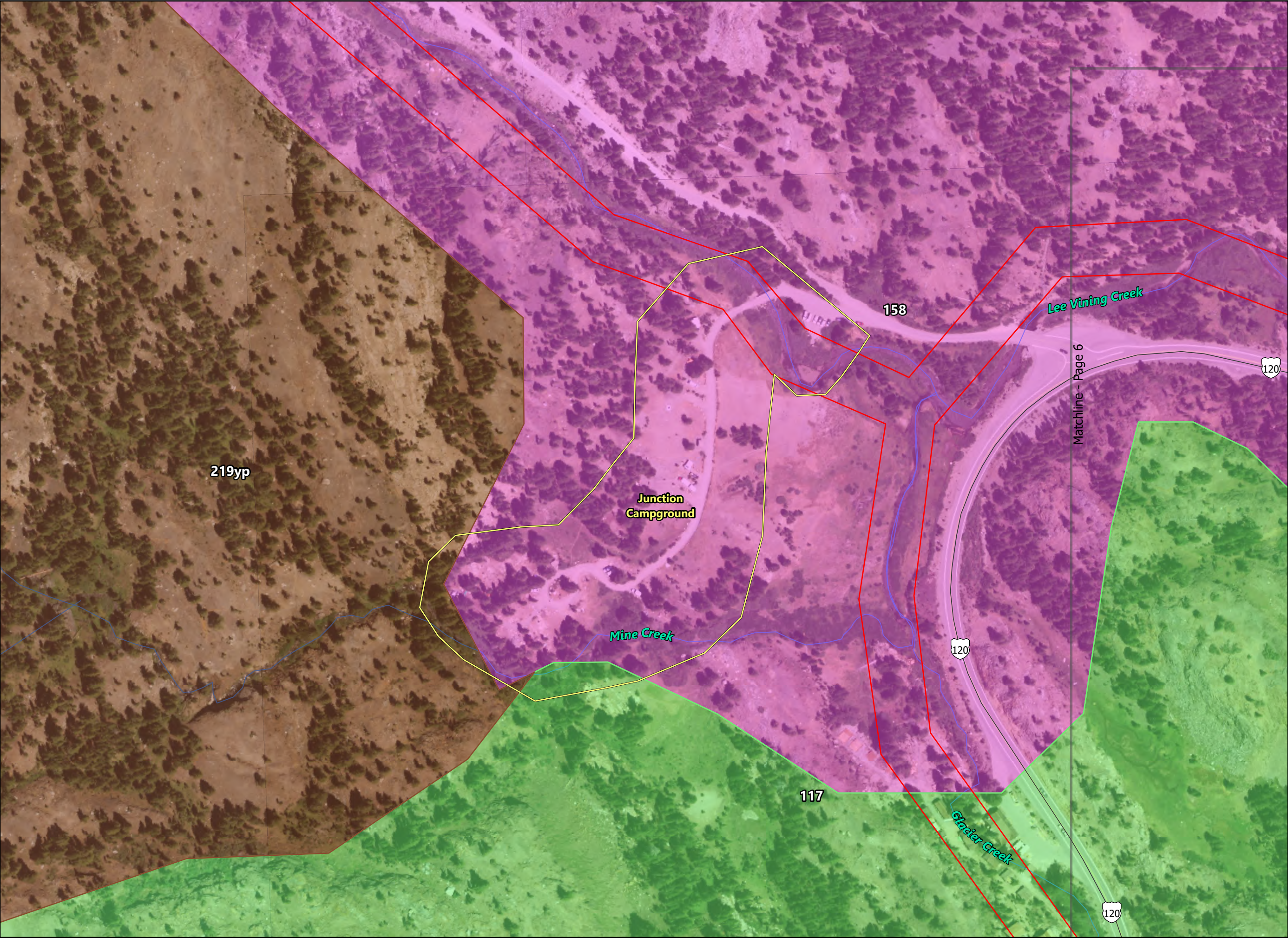
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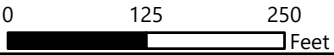
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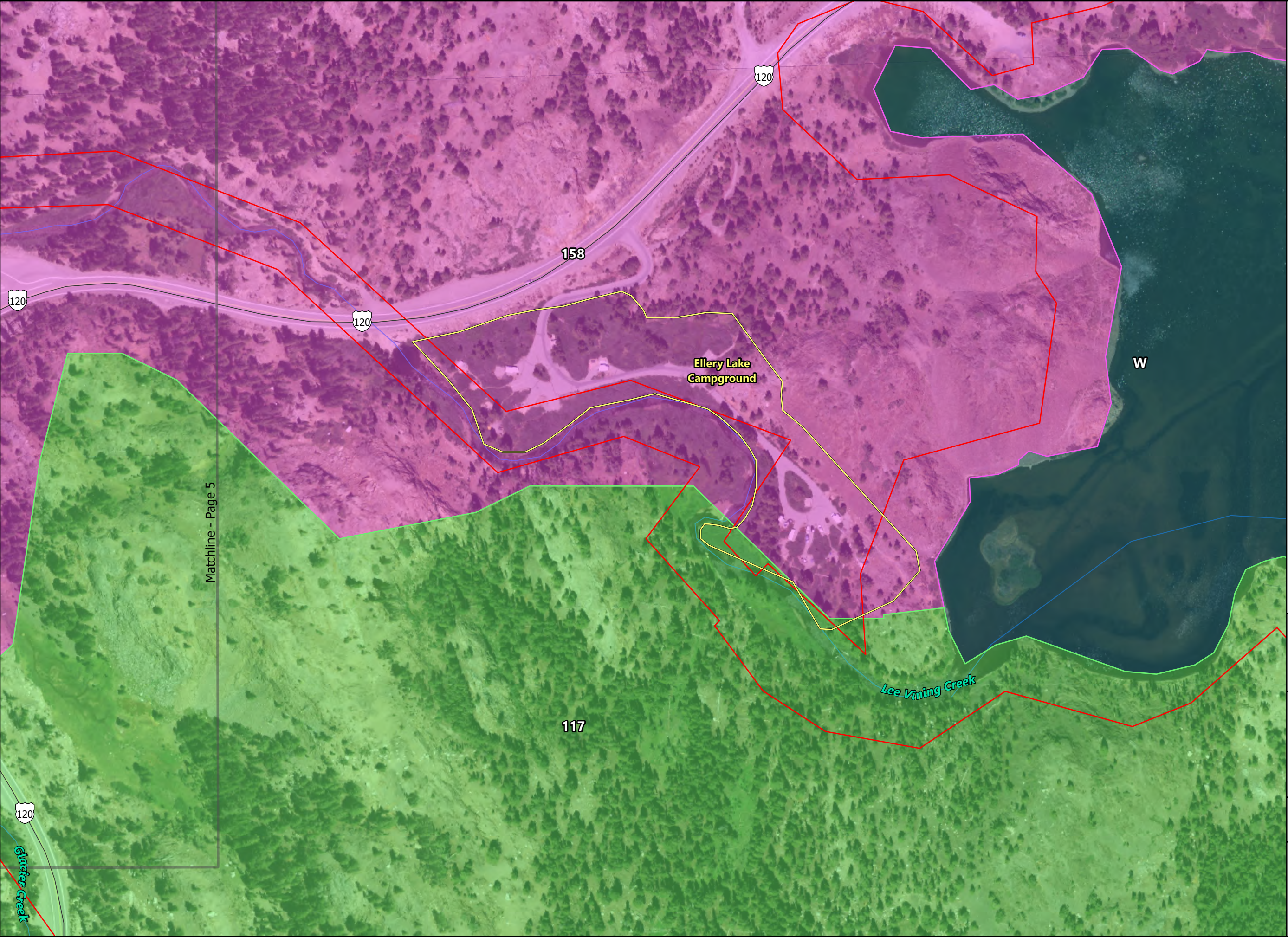
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SOUTHERN CALIFORNIA
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Soil Types

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**LEE VINING
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Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet
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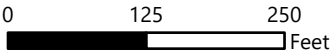
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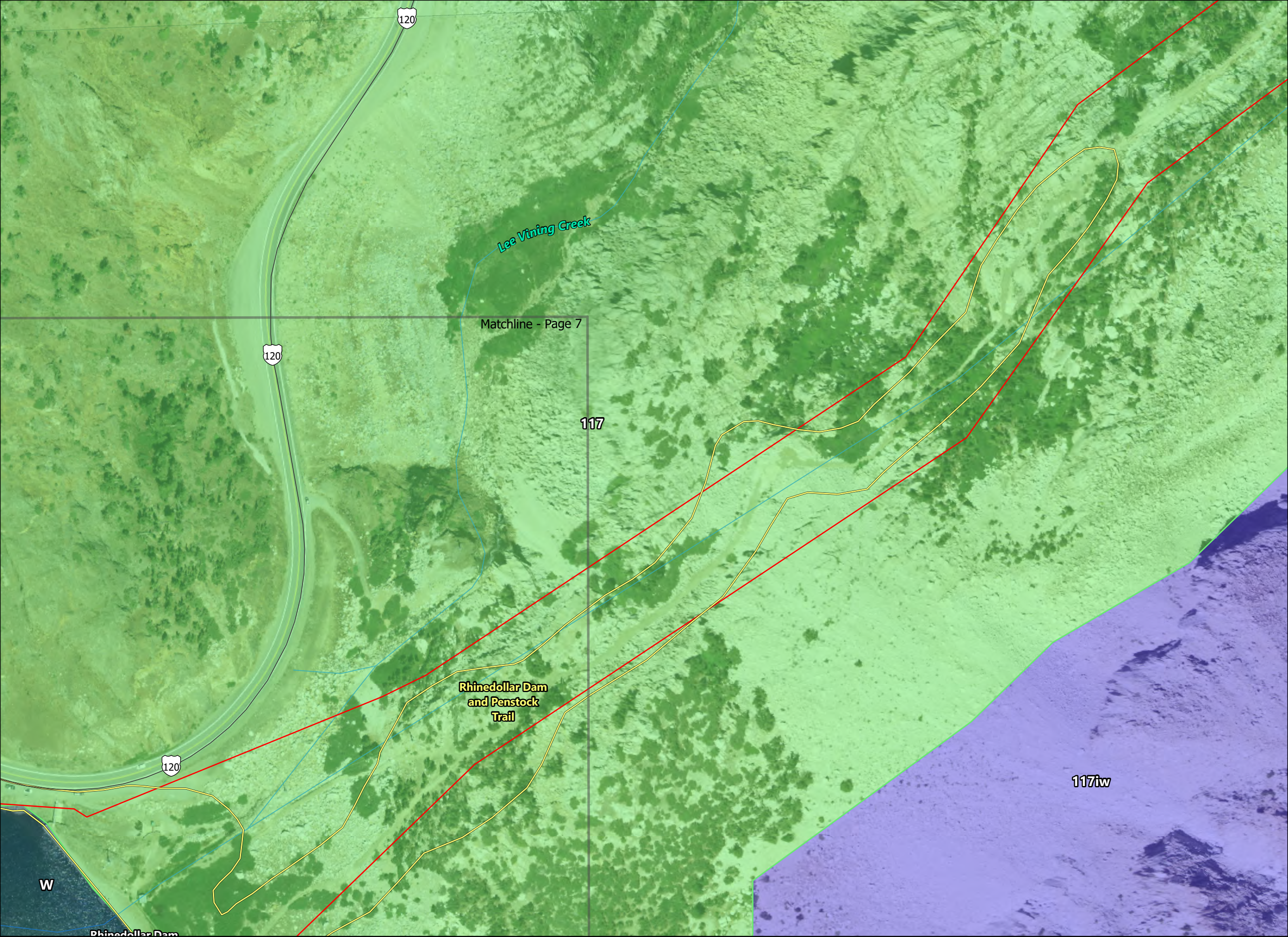
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HYDROELECTRIC PROJECT
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Base Imagery: NAIP 2020

 **SOUTHERN CALIFORNIA EDISON**
Energy for What's AheadSM

Soil Types

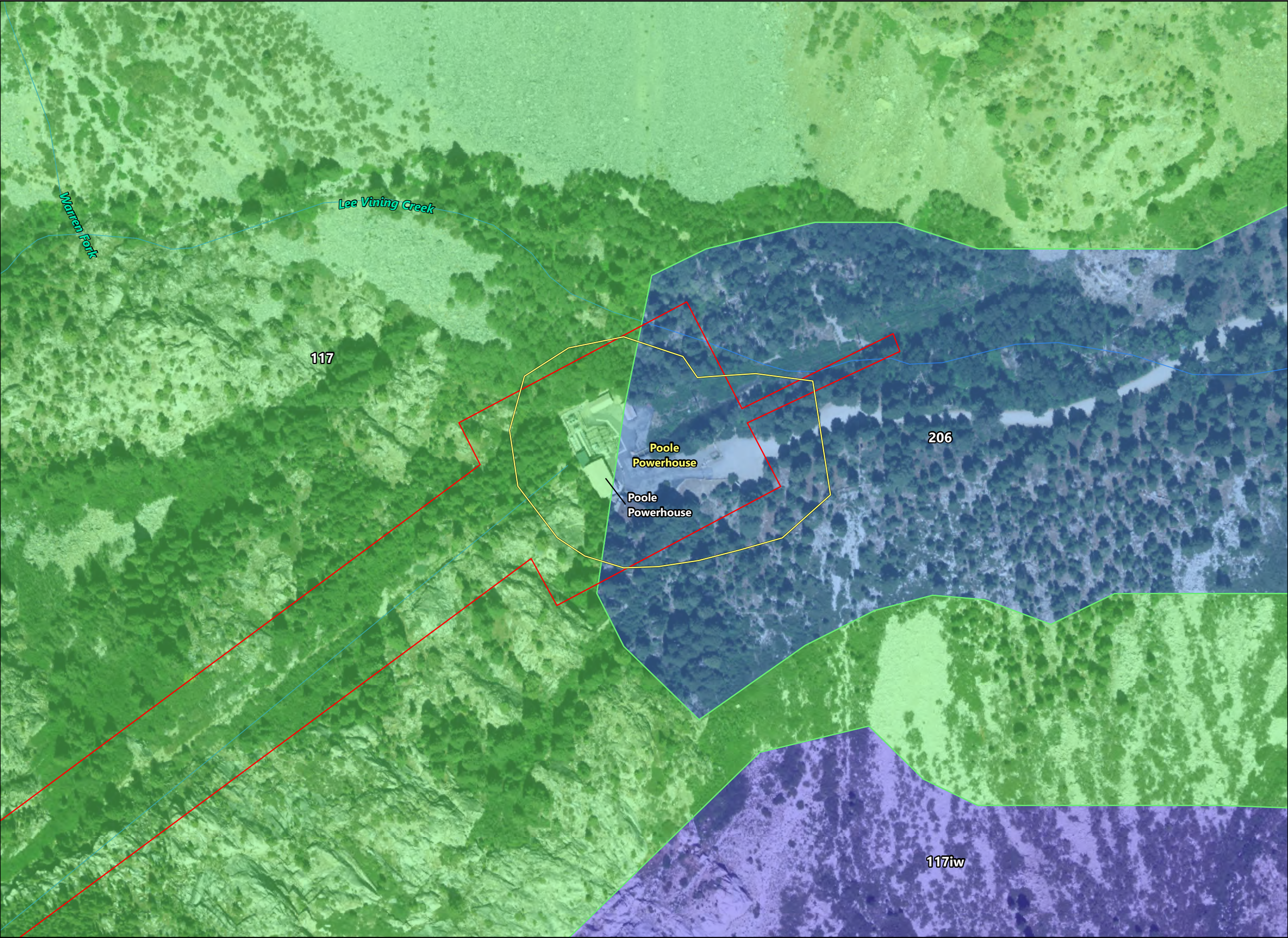
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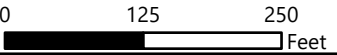
Soil Types

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LEE VINING
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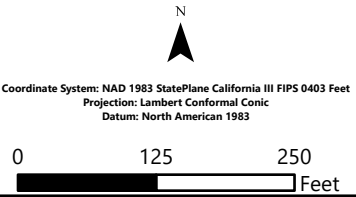


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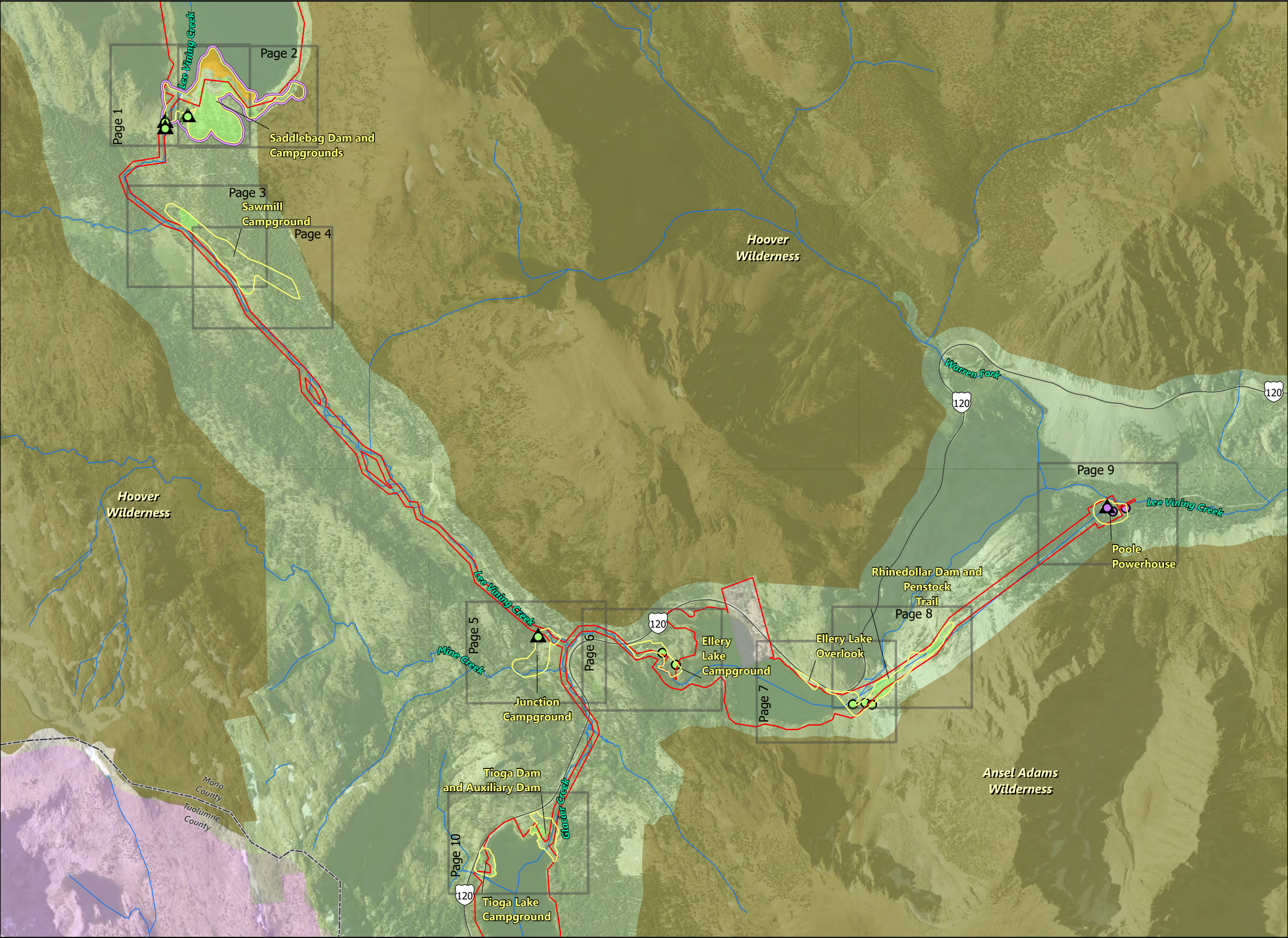
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Soil Types



Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet
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2023 Study Area

2022 Study Area

Map Extents

FERC Project Boundary (P-1388)

County Line

Wilderness Area (Inyo NF)

Inyo National Forest

Yosemite National Park

Special-status Plant Species Populations 2022

Agrostis humilis

Pinus albicaulis

Pinus albicaulis

Populus trichocarpa

Special-status Plant Species Populations 2023

Pinus albicaulis

Pinus albicaulis

Populus trichocarpa



SOUTHERN CALIFORNIA

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Botanical Resources

Study Area –

Special-status

Plant Species

LEE VINING

HYDROELECTRIC PROJECT

FERC PROJECT NO. 1388

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Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet

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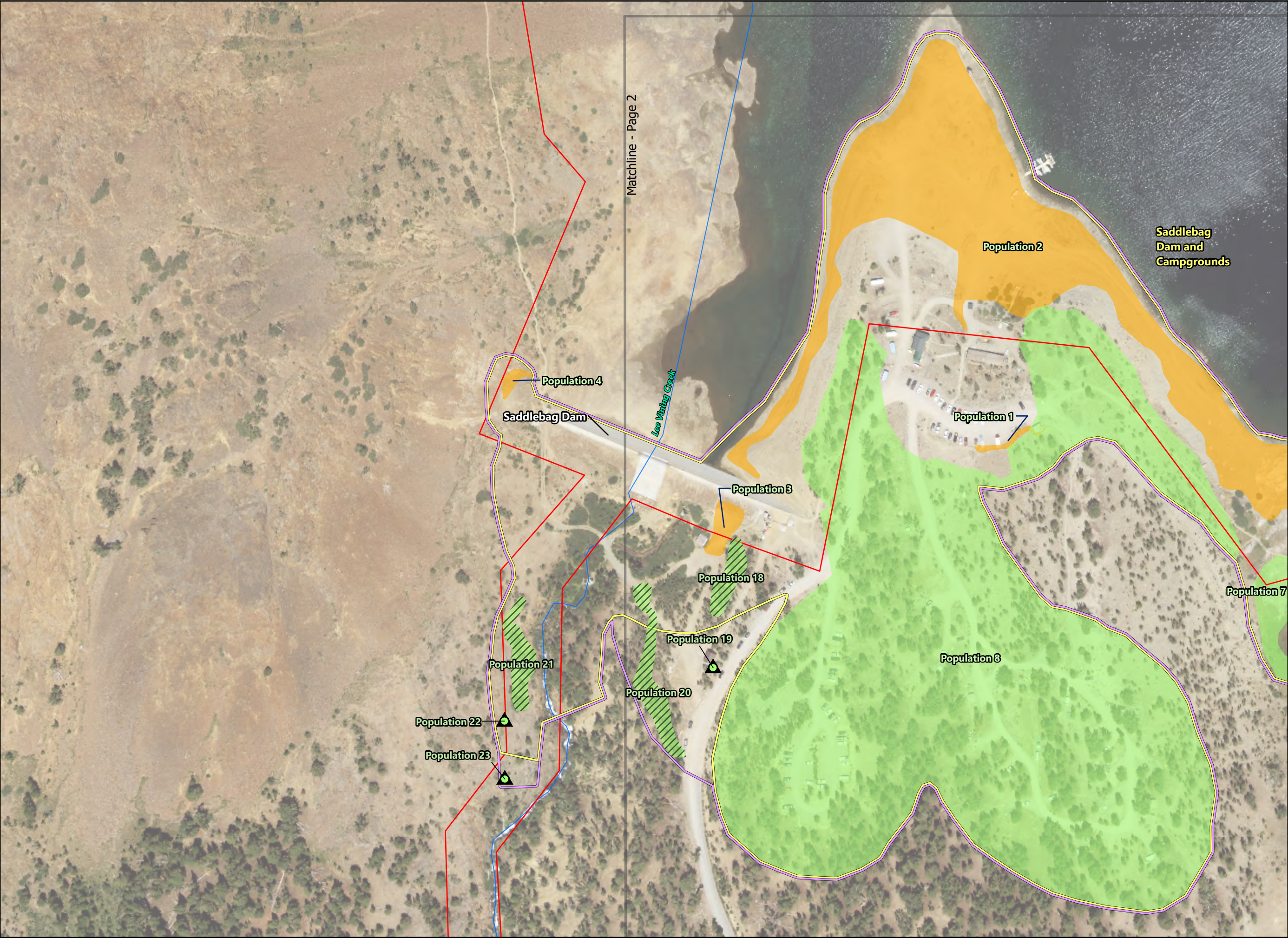
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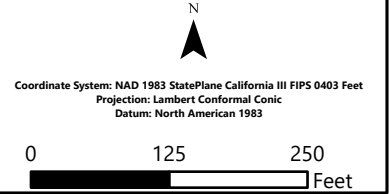
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- 2023 Study Area
- 2022 Study Area
- Map Extents
- FERC Project Boundary (P-1388)
- County Line
- Special-status Plant Species Populations 2022
 - Agrostis humilis*
 - Pinus albicaulis*
- Special-status Plant Species Populations 2023
 - Pinus albicaulis*
 - Pinus albicaulis*



Botanical Resources
Study Area –
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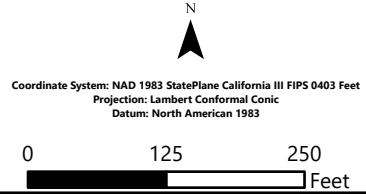


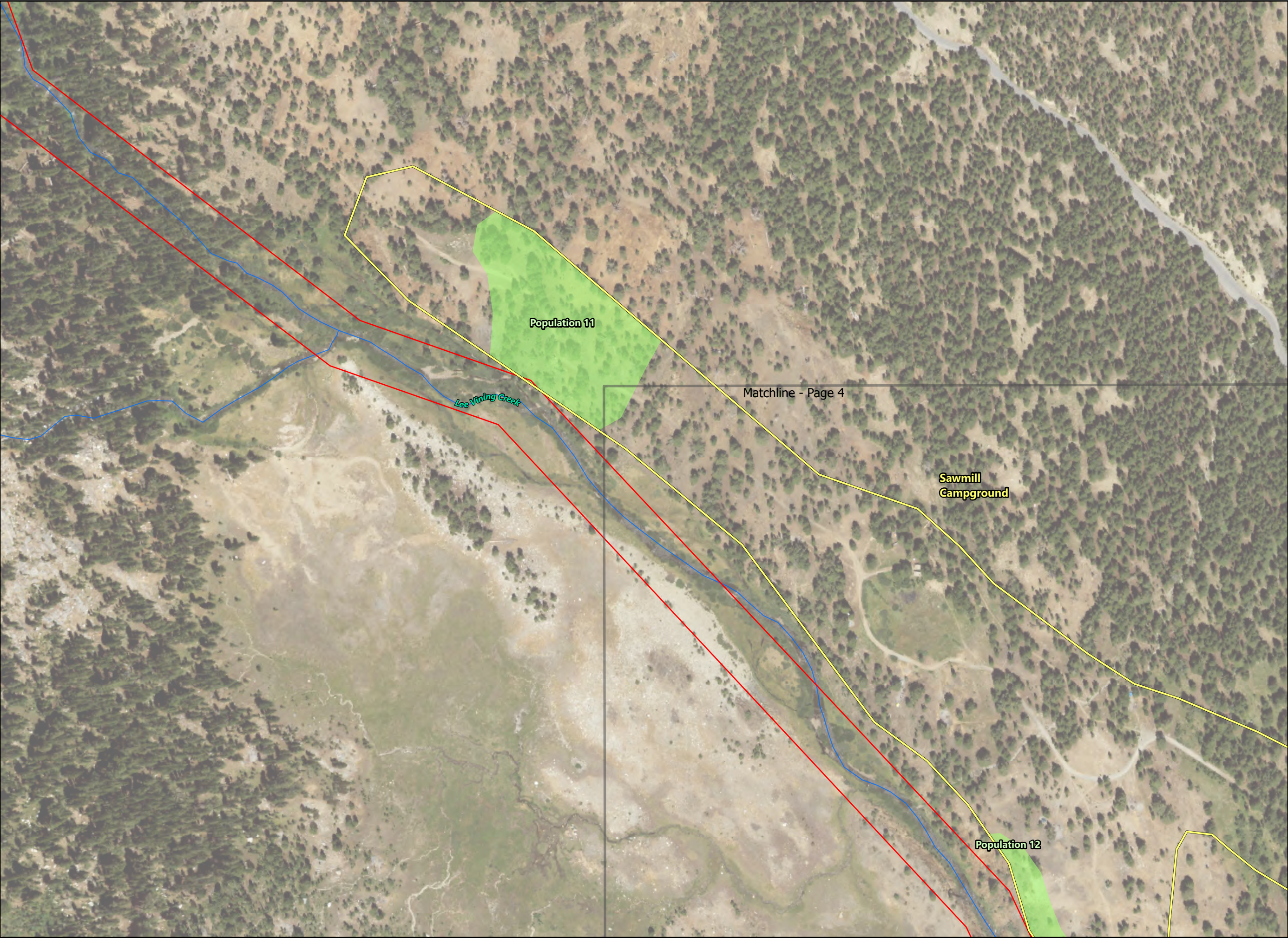
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- Special-status Plant Species Populations 2023
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 - Pinus albicaulis*



Botanical Resources
Study Area –
Special-status
Plant Species

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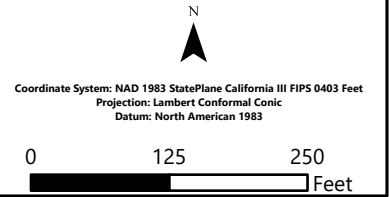


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- Map Extents
- FERC Project Boundary (P-1388)
- County Line
- Special-status Plant Species Populations 2022
- Pinus albicaulis*



Botanical Resources
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Plant Species
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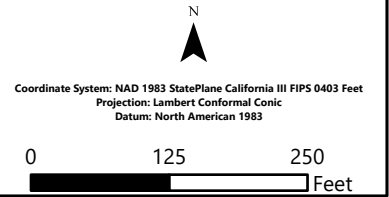




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- Map Extents
- FERC Project Boundary (P-1388)
- County Line
- Special-status Plant Species Populations 2022
 - Pinus albicaulis*



Botanical Resources
Study Area –
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FERC PROJECT NO. 1388



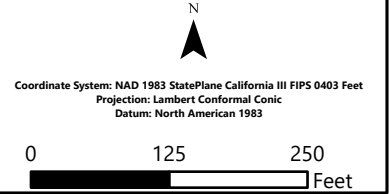
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- FERC Project Boundary (P-1388)
- County Line
- Special-status Plant Species Populations 2023
 - Pinus albicaulis*



Botanical Resources
Study Area –
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Plant Species
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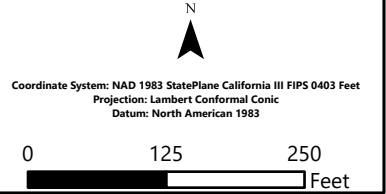




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- FERC Project Boundary (P-1388)
- County Line
- Special-status Plant Species Population 2022
 - Pinus albicaulis*



Botanical Resources
Study Area –
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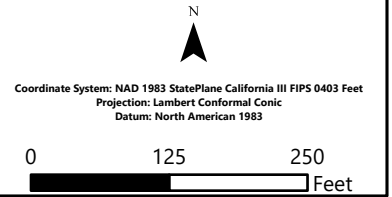


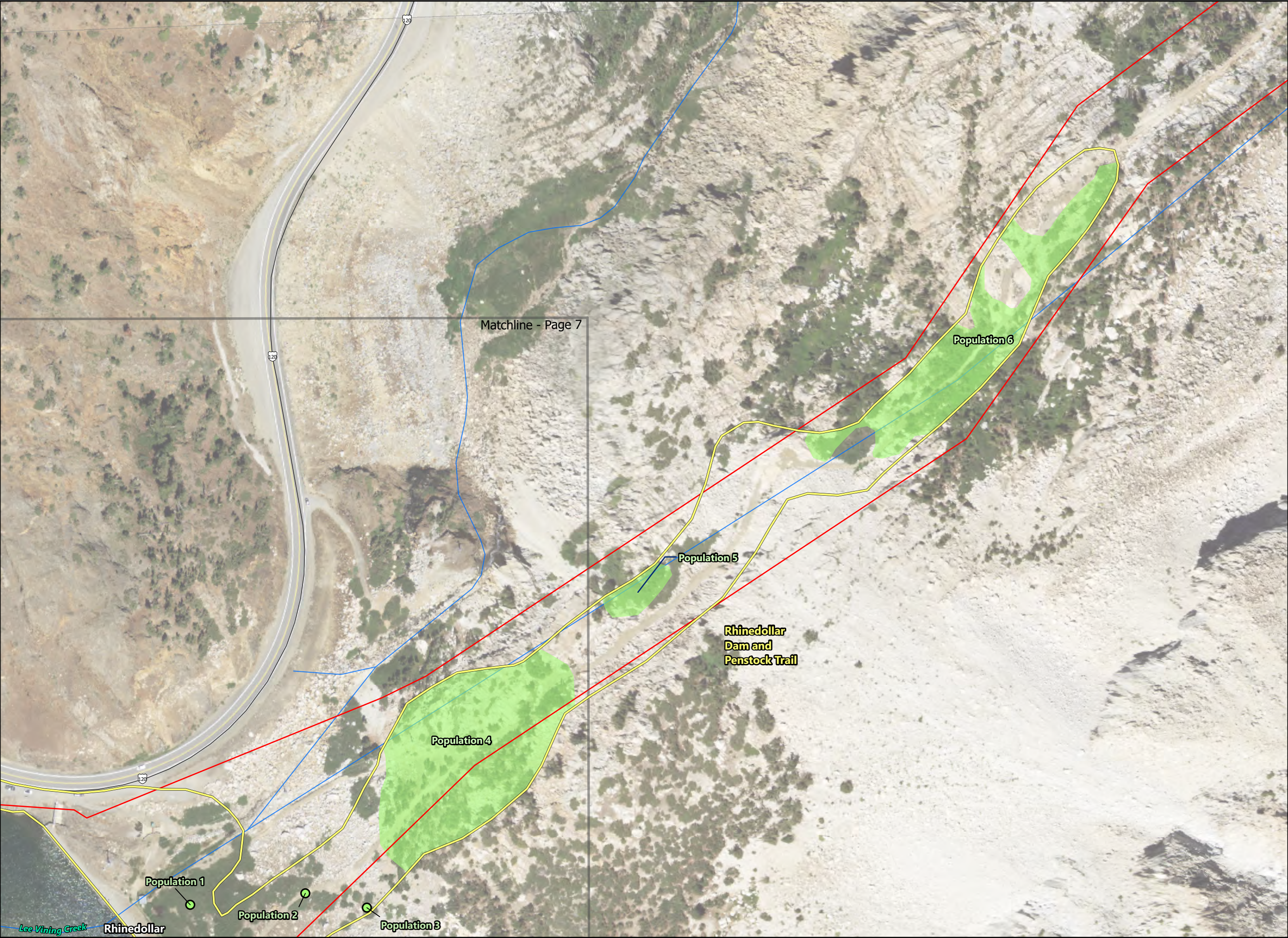


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- County Line
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- Pinus albicaulis*
- Special-status Plant Species Population 2022
- Pinus albicaulis*



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Study Area –
Special-status
Plant Species
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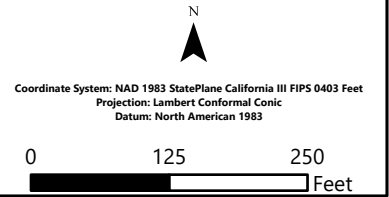


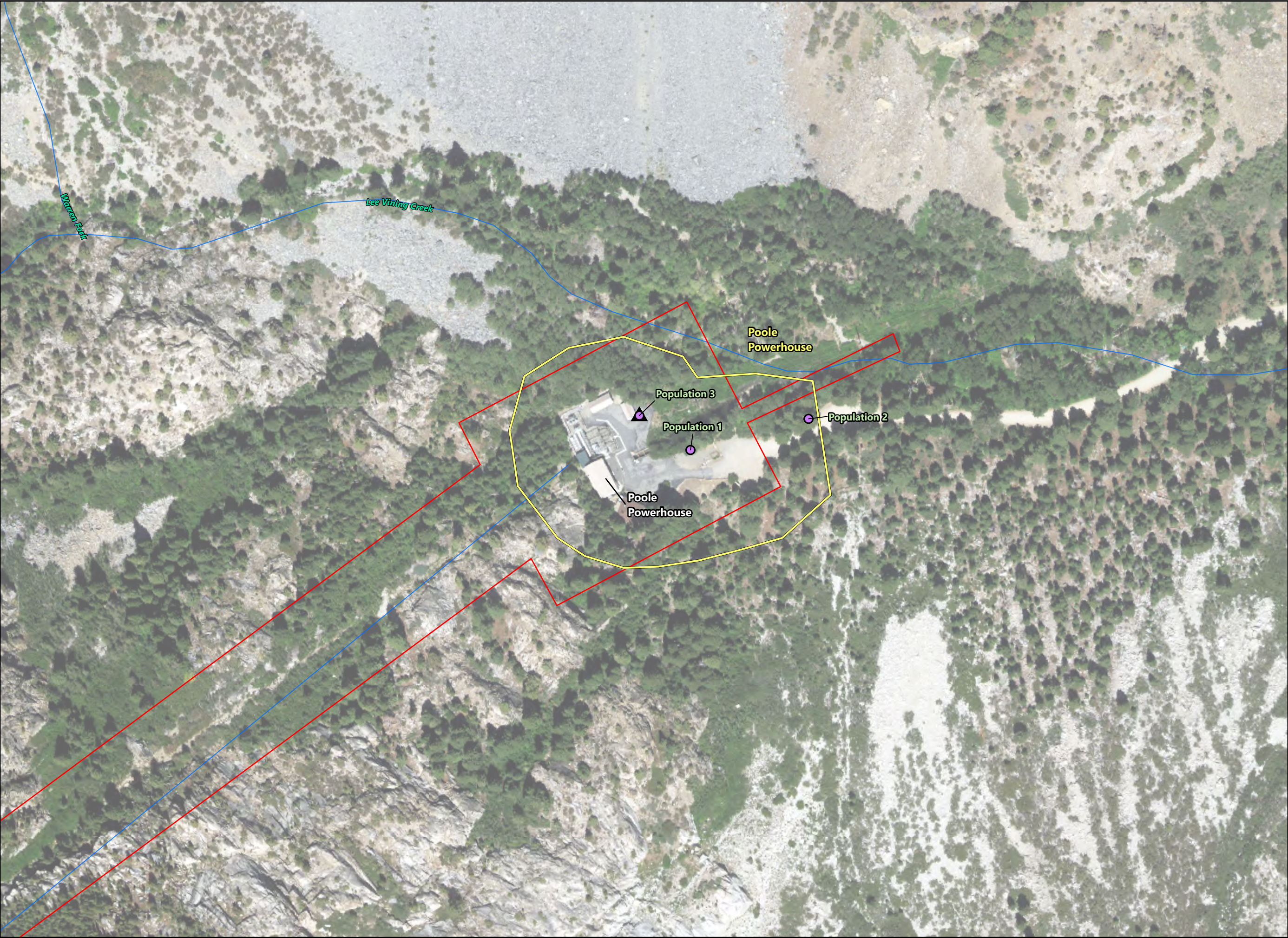


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- Map Extents
- FERC Project Boundary (P-1388)
- County Line
- Special-status Plant Species Populations 2022
 - Pinus albicaulis*
- Special-status Plant Species Population 2022
 - Pinus albicaulis*



Botanical Resources
Study Area –
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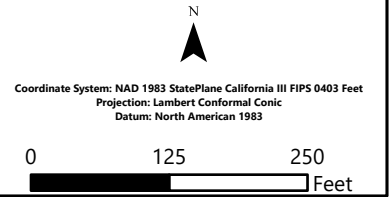
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- Map Extents
- FERC Project Boundary (P-1388)
- County Line
- Special-status Plant Species Population 2022
 - Populus trichocarpa*
- Special-status Plant Species Population 2023
 - Populus trichocarpa*



Botanical Resources
Study Area –
Special-status
Plant Species

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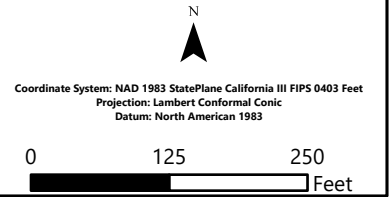
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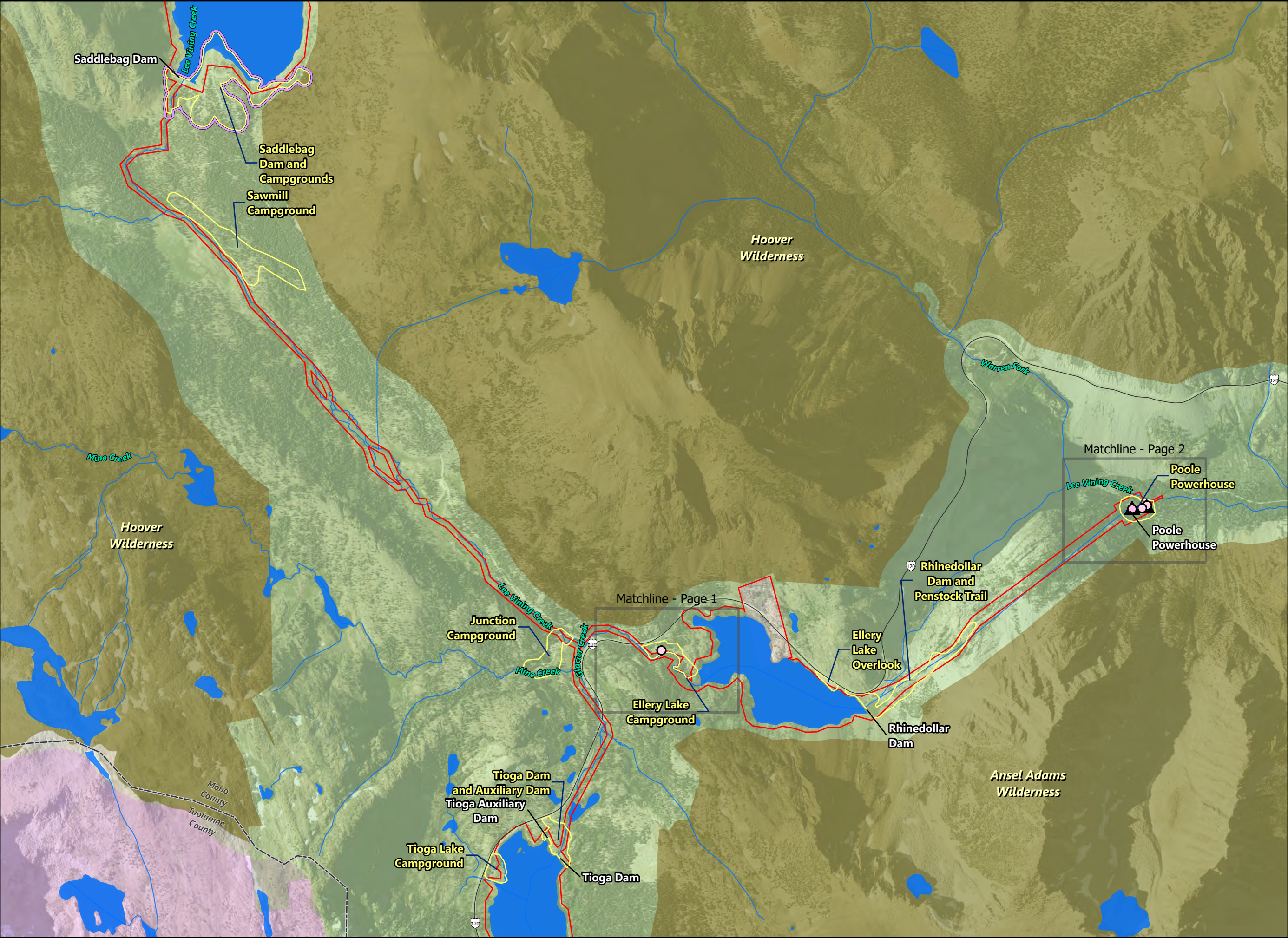


Botanical Resources
Study Area –
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Plant Species

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2023 Study Area Modification

2022 Study Area

Map Extents

County Line

FERC Project Boundary (P-1388)

Wilderness Area (Inyo NF)

Inyo National Forest

Yosemite National Park

Invasive Plant Populations 2022

Bromus tectorum

Invasive Plant Populations 2023

Bromus tectorum



**Botanical Resources
Study Area –
Invasive Species**

**LEE VINING
HYDROELECTRIC PROJECT
FERC PROJECT NO. 1388**

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Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983

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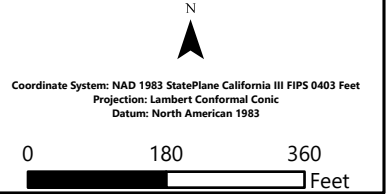
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- County Line
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- Stream Flowline
- Invasive Plant Populations 2022
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- Invasive Plant Populations 2023
 - Bromus tectorum*

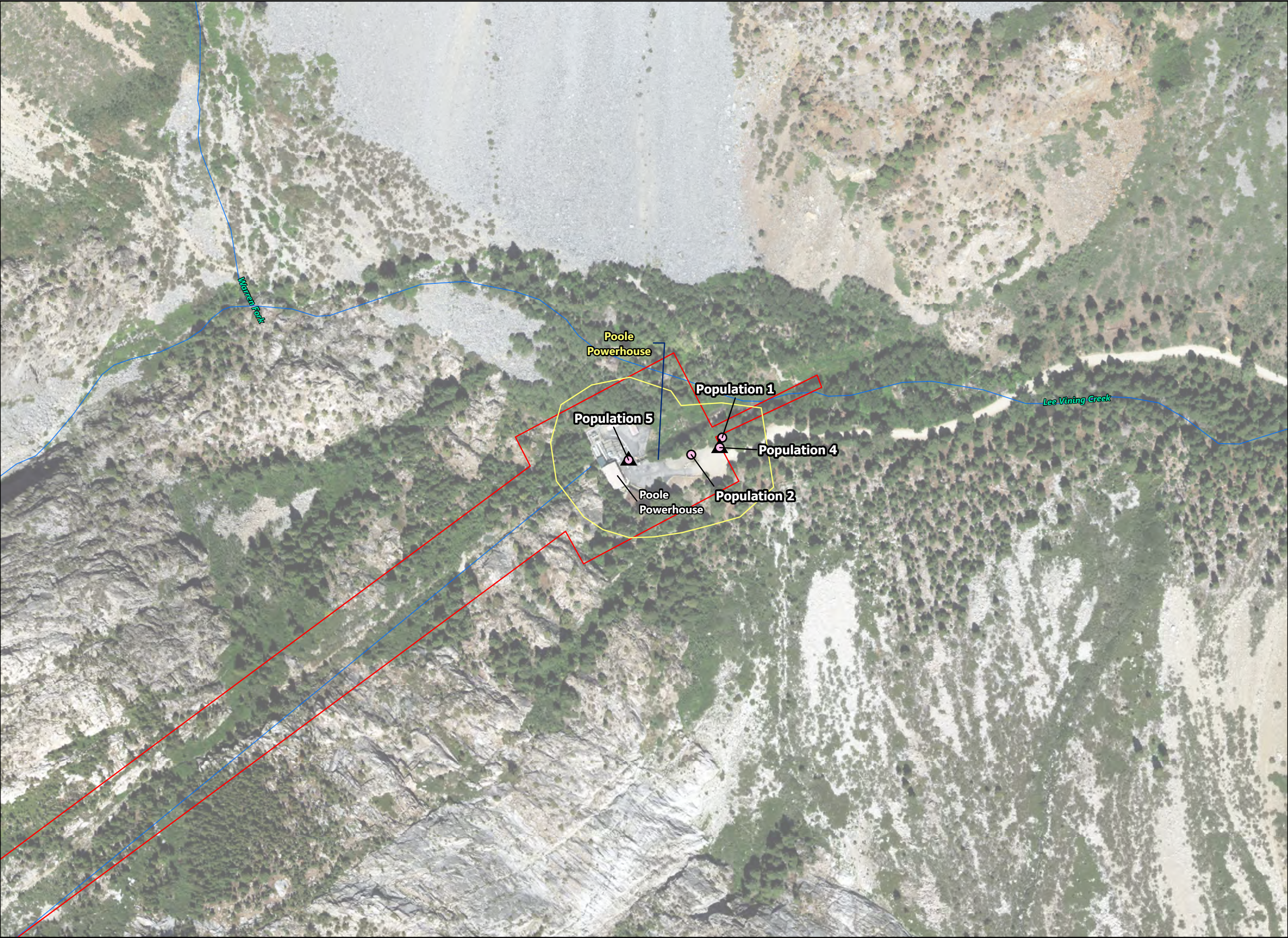


**Botanical Resources
Study Area –
Invasive Species**

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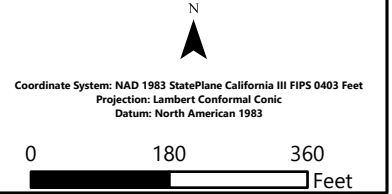
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- Map Extents
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- Stream Flowline
- Invasive Plant Populations 2022
 - Bromus tectorum*
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 - Bromus tectorum*

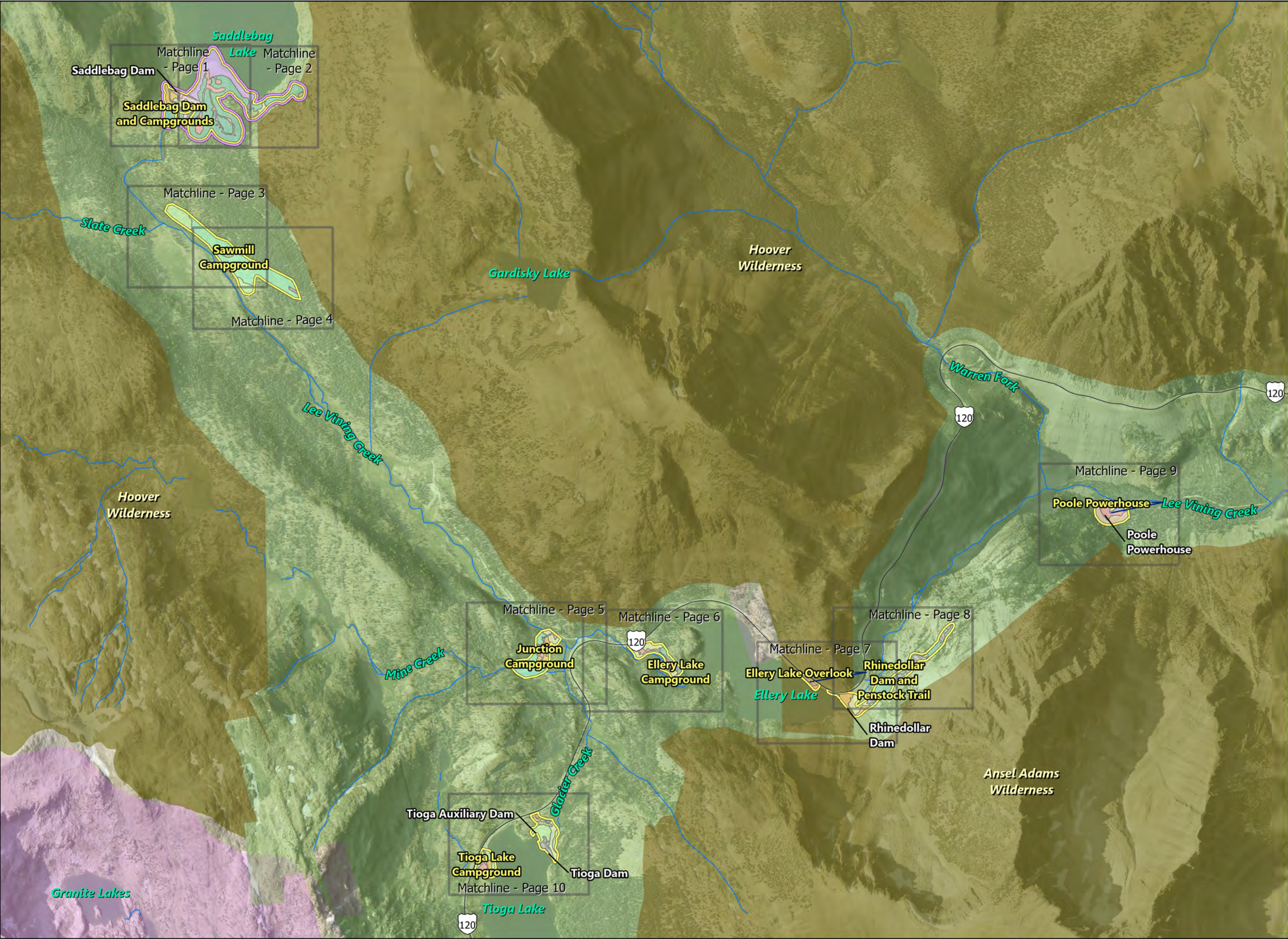


**Botanical Resources
Study Area –
Invasive Species**

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HYDROELECTRIC PROJECT
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2023 Study Area Modification

Map Extents

Study Area

Stream Flowline

Wilderness Area (Inyo NF)

Inyo National Forest

Yosemite National Park

Vegetation Type

Alpine Grasses and Forbs

Barren

Developed

Lakeshore

Lodgepole Pine

Mixed Conifer - Fir

Non-Vegetated

Quaking Aspen

Water

Wet Meadow

Whitebark Pine - Alpine Grasses and Forbs

Whitebark Pine - Lodgepole Pine

Willow

 SOUTHERN CALIFORNIA
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**Vegetation Type
Overview**

LEE VINING
HYDROELECTRIC PROJECT
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N

Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet

Projection: Lambert Conformal Conic

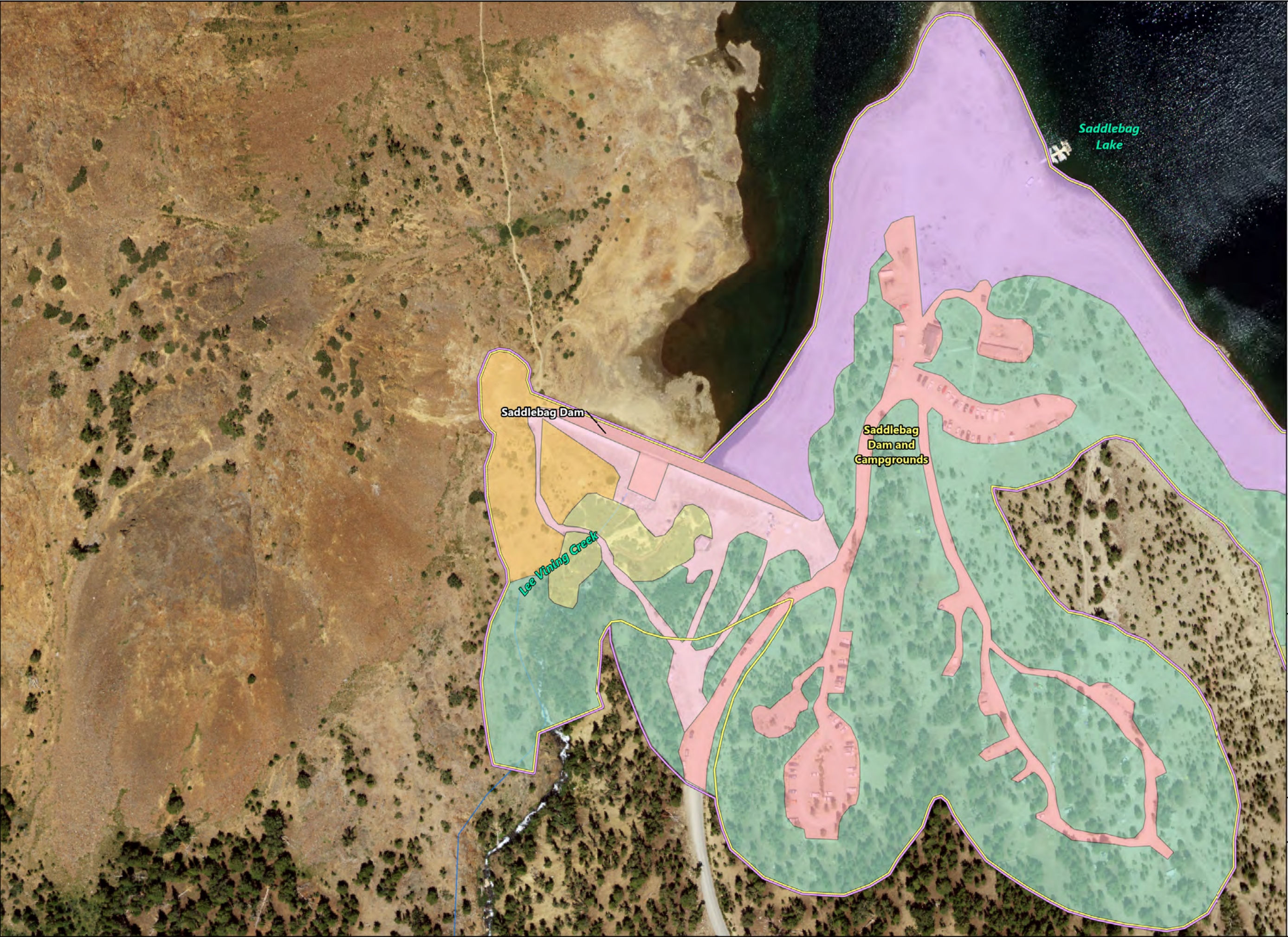
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2023 Study Area Modification

Study Area

Stream Flowline

Vegetation Type

Alpine Grasses and Forbs

Developed

Lakeshore

Non-Vegetated

Wet Meadow

Whitebark Pine - Alpine Grasses and Forbs

Willow

Base Imagery: NAIP 2020

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Vegetation Type

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Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983

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Feet



2023 Study Area Modification

Study Area

Stream Flowline

Vegetation Type

Developed

Lakeshore

Non-Vegetated

Wet Meadow

Whitebark Pine - Alpine Grasses and Forbs

Willow

Base Imagery: NAIP 2020



SOUTHERN CALIFORNIA

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N

Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet

Projection: Lambert Conformal Conic

Datum: North American 1983

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120

240

Feet



- 2023 Study Area Modification
- Study Area
- Stream Flowline
- Vegetation Type**
 - Lodgepole Pine
 - Wet Meadow
 - Whitebark Pine - Lodgepole Pine

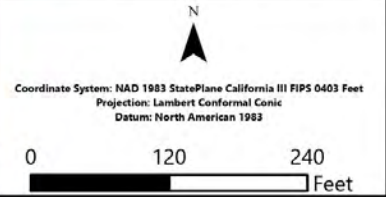
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Vegetation Type

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FERC PROJECT NO. 1388**





- 2023 Study Area Modification
- Study Area
- Stream Flowline
- Vegetation Type**
 - Developed
 - Lodgepole Pine
 - Wet Meadow
 - Whitebark Pine - Lodgepole Pine

Base Imagery: NAIP 2020



**SOUTHERN CALIFORNIA
EDISON**
Energy for What's AheadSM

**Vegetation
Type**

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N

Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983

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2023 Study Area Modification

Study Area

Stream Flowline

Vegetation Type

Alpine Grasses and Forbs

Developed

Lodgepole Pine

Willow

Base Imagery: NAIP 2020



SOUTHERN CALIFORNIA

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Vegetation Type

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Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983

0

120

240

Feet



- 2023 Study Area Modification
- Study Area
- Stream Flowline
- Vegetation Type
 - Developed
 - Whitebark Pine - Alpine Grasses and Forbs
 - Willow

Base Imagery: NAIP 2020



SOUTHERN CALIFORNIA
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Vegetation Type

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**LEE VINING
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Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983

0 120 240 Feet



- 2023 Study Area Modification
 - Study Area
 - Stream Flowline
- Vegetation Type**
- Alpine Grasses and Forbs
 - Barren
 - Developed
 - Whitebark Pine - Alpine Grasses and Forbs
 - Willow

Base Imagery: NAIP 2020



SOUTHERN CALIFORNIA
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Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983

0 120 240 Feet



- 2023 Study Area Modification
- Study Area
- Stream Flowline
- Vegetation Type**
- Alpine Grasses and Forbs
 - Barren
 - Developed
 - Whitebark Pine - Alpine Grasses and Forbs
 - Willow

Base Imagery: NAIP 2020



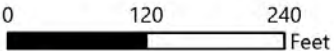
Vegetation Type

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**LEE VINING
HYDROELECTRIC PROJECT
FERC PROJECT NO. 1388**



Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983





- 2023 Study Area Modification
- Study Area
- Stream Flowline
- Vegetation Type
 - Developed
 - Mixed Conifer - Fir
 - Quaking Aspen
 - Willow

Base Imagery: NAIP 2020



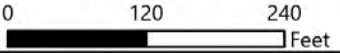
Vegetation Type

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Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983





- 2023 Study Area Modification
 - Study Area
 - Stream Flowline
- Vegetation Type**
- Alpine Grasses and Forbs
 - Barren
 - Developed
 - Water
 - Wet Meadow
 - Whitebark Pine - Lodgepole Pine
 - Willow

Base Imagery: NAIP 2020

 SOUTHERN CALIFORNIA
EDISON
Energy for What's AheadSM

Vegetation Type

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Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983

0 120 240 Feet

APPENDIX B LITERATURE REVIEW RESULTS

Table B-1. Potential for Special-status Plant Species to Occur

Scientific/Common Name ^a	Federal Status ^b	State Status and CRPR Rank ^c	Blooming Period ^d	Habitat	Likelihood for Occurrence Within Study Area ^{e,f} and Occurrence Notes
Known to Occur					
<i>Agrostis humilis</i> mountain bent grass	SCC	2B.3	Jul–Sep	Perennial herb found in alpine boulder and rock field, meadows and seeps, and subalpine coniferous forest, sometimes in carbonate soil; 3,200–10,500 feet	Known to occur. This species has numerous records in the local watershed and two 1999 records within the study area: (1) 820 feet southeast from the Saddlebag Lake parking lot (YOSE.99S148) and (2) 1,640 feet up Lee Vining Creek from Gardisky Lake Trailhead, on east side of the creek (YOSE.99S145).
<i>Boechera tiehmii</i> Tiehm's rockcress	SCC	1B.3	Jul–Aug	Perennial herb found in alpine boulder and rock field (granitic); 3,590–11,780 feet	Known to occur. This species has three records since 1990 within the study area in a cirque at east base of Tioga Peak uphill from State Route 120 between Warren Fork and Ellery Lake (RSA565042).
<i>Botrychium crenulatum</i> scalloped moonwort	SCC	2B.2	Jun–Sep	Perennial rhizomatous herb found in bogs and fens, lower montane coniferous forest, meadows and seeps, marshes and swamps (freshwater), and upper montane coniferous forest; 3,280–10,760 feet	Known to occur. This species has been recorded in the study area in 1998 on the Nunatak Trail downstream of Tioga Lake (UCR123116).
<i>Carex vallicola</i> western valley sedge	SCC	2B.3	Jul–Aug	Perennial rhizomatous herb found in mesic soil in Great Basin scrub and meadows and seeps; 2,805–9,205 feet	Known to occur. This species has been recorded in the study area in 2006 in a meadow across State Route 120 and upstream by 0.1 mile (CHSC99395).
<i>Eriogonum alexanderae</i> Alexander's buckwheat ^g	SCC	1B.1	May–Jul	Perennial herb found in shale or gravelly soil in Great Basin scrub, and pinyon and juniper woodland; 4,265–5,577 feet	Known to occur. This species has been recorded in the study area in 2002 at the south end of Saddlebag Lake (SEINET 523071).

Scientific/Common Name ^a	Federal Status ^b	State Status and CRPR Rank ^c	Blooming Period ^d	Habitat	Likelihood for Occurrence Within Study Area ^{e,f} and Occurrence Notes
<i>Pinus albicaulis</i> whitebark pine	Threatened; SCC		NA	Tree found in subalpine forest; 10,000–12,100 feet	Known to occur. This species has been recorded in the study area and in the local watershed numerous times in the last 100 years.
May Occur					
<i>Boechnera bodiensis</i> Bodie Hills rockcress	SCC	1B.3	Jun–Jul (Aug)	Perennial herb found in alpine boulder and rock field, Great Basin scrub, pinyon and juniper woodland, and subalpine coniferous forest; 3,530–11,580 feet	May occur. This species was recorded in 1999, 3.2 miles from the study area but outside the local watershed. Suitable habitat is present.
<i>Boechnera shockleyi</i> Shockley's rockcress	SCC	2B.2	May-Jun	Perennial herb found in carbonate or quartzite, rocky or gravelly soils in pinyon and juniper woodland; 2,625–6,930 feet	May occur. This species was recorded in 1984 in the local watershed 0.7 mile from the study area. Suitable habitat is present.
<i>Boechnera tularensis</i> Tulare rockcress	SCC	1B.3	(May) Jun–Jul (Aug)	Perennial herb found in rocky slopes, sometimes roadsides, subalpine coniferous forest, and upper montane coniferous forest; 3,350–10,990 feet	May occur. This species was recorded in 1942, 3.6 miles from the study area but outside the local watershed. Suitable habitat is present.
<i>Botrychium ascendens</i> upswept moonwort	SCC	2B.3	(Jun) Jul–Aug	Perennial rhizomatous herb found in mesic soil in lower montane coniferous forest, and meadows and seeps; 3,045–9,990 feet	May occur. This species was recorded in 2007, 7.3 miles from the study area but outside the local watershed. Suitable habitat is present.
<i>Botrychium lineare</i> slender moonwort	SCC	1B.1	Unknown	Perennial herb found in meadows and seeps, subalpine coniferous forest, and upper montane coniferous forest (often disturbed areas); 2,600–8,530 feet	May occur. This species was recorded in 2013, 4.6 miles from the study area but outside the local watershed. Suitable habitat is present.
<i>Botrychium lunaria</i> common moonwort		2B.3	Aug	Perennial rhizomatous herb found in meadows and seeps, subalpine coniferous forest, and upper montane coniferous forest; 3,400–11,155 feet	May occur. This species was recorded in 1981, 5.7 miles from the study area but outside the local watershed. Suitable habitat is present.

Scientific/Common Name ^a	Federal Status ^b	State Status and CRPR Rank ^c	Blooming Period ^d	Habitat	Likelihood for Occurrence Within Study Area ^{e,f} and Occurrence Notes
<i>Botrychium minganense</i> Mingan moonwort	SCC	2B.2	Jul–Sep	Perennial rhizomatous herb found in mesic soil in bogs and fens, lower montane coniferous forest, meadows and seeps (edges), and upper montane coniferous forest; 2,180–7,150 feet	May occur. This species was recorded in 1961, 1.0 mile from the study area but outside the local watershed. Suitable habitat is present.
<i>Botrychium paradoxum</i> paradox moonwort		2B.1	Aug	Perennial rhizomatous herb found in alpine boulder and rock field (limestone and marble), and upper montane coniferous forest (moist); 4,200–13,780 feet	May occur. This species was recorded in 2008, 5.7 miles from the study area but outside the local watershed. Suitable habitat is present.
<i>Botrychium yaaxudakeit</i> giant moonwort		2B.1	Aug	Perennial rhizomatous herb found in limestone and marble soil in alpine boulder and rock field (meadows); 3,200–10,500 feet	May occur. This species was recorded in 2007, 6.9 miles from the study area but outside the local watershed. Suitable habitat is present.
<i>Bruchia bolanderi</i> Bolander's bruchia	SCC	4.2	NA	Moss found in damp soil in lower montane coniferous forest, meadows and seeps, upper montane coniferous forest; 2,800–9,185 feet	May occur. This species was recorded in 2000, 4.1 miles from the study area but outside the local watershed. Suitable habitat is present.
<i>Carex davyi</i> Davy's sedge	SCC	1B.3	May–Aug	Perennial herb found in subalpine coniferous forest and upper montane coniferous forest; 3,200–10,500 feet	May occur. This species was recorded in 1944, 4.8 miles from the study area but outside the local watershed. Suitable habitat is present.
<i>Carex praticola</i> northern meadow sedge	SCC	2B.2	May–Jul	Perennial herb found in mesic soil in meadows and seeps; 3,200–10,500 feet	May occur. This species was recorded in 2003 in the local watershed 0.3 mile from the study area. Suitable habitat is present.
<i>Carex scirpoidea</i> ssp. <i>pseudoscirpoidea</i> western single-spiked sedge	SCC	2B.2	Jul, Sep	Perennial rhizomatous herb found in mesic, often carbonate soil in alpine boulder and rock field, meadows and seeps, and subalpine coniferous forest (rocky); 3,700–12,140 feet	May occur. This species was recorded in 2009 in the local watershed 1.1 miles from the study area. Suitable habitat is present.

Scientific/Common Name ^a	Federal Status ^b	State Status and CRPR Rank ^c	Blooming Period ^d	Habitat	Likelihood for Occurrence Within Study Area ^{e,f} and Occurrence Notes
<i>Carex tiogana</i> Tioga Pass sedge	SCC	1B.3	Jul–Aug	Perennial herb found in meadows and seeps (mesic, lake margins); 3,300–10,825 feet	May occur. This species was recorded in 2010, 1.6 miles from the study area but outside the local watershed. Suitable habitat is present.
<i>Claytonia megarhiza</i> fell-fields claytonia	SCC	2B.3	Jul–Sep	Perennial herb found in crevices between rocks in alpine boulder and rock field, and subalpine coniferous forest (rocky or gravelly); 3,532–11,590 feet	May occur. This species was recorded in 2007, 7.4 miles from the study area but outside the local watershed. Suitable habitat is present.
<i>Draba cana</i> canescent draba		2B.3	Jul	Perennial herb found in carbonate soil in alpine boulder and rock field, meadows and seeps, and subalpine coniferous forest; 3,505–11,500 feet	May occur. This species was recorded in 1990 in the local watershed 0.5 mile from the study area. Suitable habitat is present.
<i>Draba monoensis</i> White Mountains draba	SCC	1B.2	Aug	Perennial herb found in alpine boulder and rock fields and meadows and seeps; 9,000–11,880 feet	May occur. This species was recorded in 1949, 7 miles from the study area but outside the local watershed. Suitable habitat is present.
<i>Draba praealta</i> tall draba		2B.3	Jul–Aug	Perennial herb found in mesic soil in meadows and seeps; 3,415–11,205 feet	May occur. This species was recorded in 1990 in the local watershed 0.4 mile from the study area. Suitable habitat is present.
<i>Festuca minutiflora</i> small-flowered fescue		2B.3	Jul	Perennial herb found in alpine boulder and rock field; 4,050–13,285 feet	May occur. This species was recorded in 2009 in the local watershed 2 miles from the study area. Suitable habitat is present.
<i>Helodium blandowii</i> Blandow's bog moss	SCC	2B.3		Moss found in meadows, seeps, and subalpine coniferous forest on damp soil, especially under willows among leaf litter. 6,109–8,858 feet	May occur. Detailed location information is not available for this species, but it was reported approximately 30 miles from the study area outside the local watershed. Suitable habitat is present.

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<i>Horkelia hispidula</i> White Mountains horkelia	SCC	1B.3	Jun–Aug	Perennial herb found in Great Basin scrub, subalpine coniferous forest, alpine dwarf scrub, and dry flats, mostly in bristlecone forest. 9,843–11,155 feet	May occur. Outside current known geographic range but reported from Saddlebag Lake in 1940. Suitable habitat is present.
<i>Jamesia americana</i> var. <i>rosea</i> rosy-petalled cliffbush	SCC	4.3	Jul–Aug	Perennial deciduous shrub found on rocky slopes and cliffs in subalpine and alpine areas; 6,791–12,139 feet	May occur. Outside current known geographic range but reported 8.8 miles from the study area in 1949. Suitable habitat is present.
<i>Kobresia myosuroides</i> seep kobresia	SCC	2B.2	(Jun) Aug	Perennial rhizomatous herb found in alpine boulder and rock field (mesic), meadows and seeps (carbonate), and subalpine coniferous forest; 3,245–10,645 feet	May occur. This species was recorded in 2010, 1.6 miles from the study area but outside the local watershed. Suitable habitat is present.
<i>Lupinus gracilentus</i> slender lupine		1B.3	Jul–Aug	Perennial herb found in subalpine coniferous forest; 3,500–11,485 feet	May occur. This species was recorded in 1997, 0.2 mile from the study area but outside the local watershed. Suitable habitat is present.
<i>Meesia longiseta</i> long seta hump moss		2B.3	NA	Moss found in carbonate, on soil in bogs and fens, meadows and seeps, and upper montane coniferous forest; 5,741–9,900 feet	May occur. This species was recorded in 2000, 4.1 miles from the study area but outside the local watershed. Suitable habitat is present.
<i>Pohlia tundrae</i> tundra thread moss		2B.3	NA	Moss found in gravelly, damp soil in alpine boulder and rock field; 3,000–9,845 feet	May occur. This species was recorded in 2009, 1.7 miles from the study area but outside the local watershed. Suitable habitat is present.
<i>Potamogeton epihydrus</i> Nuttall's ribbon-leaved pondweed		2B.2	(Jun) Jul–Sep	Perennial rhizomatous herb found in marshes and swamps (assorted shallow freshwater); 2,172–9,182 feet	May occur. This species was recorded in 2008, 8.1 miles from the study area but outside the local watershed. Suitable habitat is present.

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<i>Potamogeton praelongus</i> white-stemmed pondweed		2B.3	Jul–Aug	Perennial rhizomatous herb (aquatic) found in marshes and swamps (deep water, lakes); 5,905–9,842 feet	May occur. Outside current known geographic range but reported 4.9 miles from the study area in 1934. Suitable habitat is present.
<i>Potamogeton robbinsii</i> Robbins' pondweed		2B.3	Jul–Aug	Perennial rhizomatous herb (aquatic) found in marshes and swamps (deep water, lakes); 3,300–10,825 feet	May occur. This species was recorded in 2008, 5.5 miles from the study area but outside the local watershed. Suitable habitat is present.
<i>Sabulina stricta</i> bog sandwort		2B.3	Jul–Sep	Perennial herb (aquatic) found in alpine boulder and rock field, alpine dwarf scrub, and meadows and seeps; 3,960–12,990 feet	May occur. This species was recorded in 1990 in the local watershed 0.2 mile from the study area. Suitable habitat is present.
<i>Salix brachycarpa</i> var. <i>brachycarpa</i> short-fruited willow		2B.3	Jun–Jul	Perennial herb found in carbonate soil in alpine dwarf scrub, meadows and seeps, and subalpine coniferous forest; 3,500–11,485 feet	May occur. This species was recorded in 1993, 0.5 mile from the study area but outside the local watershed. Suitable habitat is present.
<i>Salix nivalis</i> snow willow		2B.3	Jul–Aug	Perennial deciduous shrub found in alpine dwarf scrub; 3,500–11,485 feet	May occur. This species has been recorded numerous times in the last 90 years on the ridgelines surrounding the study area. Suitable habitat is present.
<i>Silene oregana</i> Oregon campion		2B.2	Jul–Sep	Perennial deciduous shrub found in Great Basin scrub and subalpine coniferous forest; 2,500–8,200 feet	May occur. This species was recorded in 1995, 1.5 miles from the study area but outside the local watershed. Suitable habitat is present.
<i>Triglochin palustris</i> marsh arrow-grass		2B.3	Jul–Aug	Perennial rhizomatous herb found in mesic soil in meadows and seeps, marshes and swamps (freshwater), and subalpine coniferous forest; 3,700–12,140 feet	May occur. This species was recorded in 2012, 3.0 miles from the study area but outside the local watershed. Suitable habitat is present.

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<i>Viola purpurea</i> ssp. <i>aurea</i> golden violet		2B.2	Apr–Jun	Perennial herb found in sandy soil in Great Basin scrub, and pinyon and juniper woodland; 2,500–8,200 feet	May occur. This species was recorded in 1980, 5.5 miles from the study area but outside the local watershed. Suitable habitat is present.
Unlikely to Occur					
<i>Abronia alpina</i> Ramshaw Meadows abronia	SCC	1B.1	Jul–Aug	Perennial herb found in granitic, gravelly margins of meadows in gravel and sand with <i>Hulsea</i> spp. and <i>Lupinus</i> spp.; 7,874–8,858 feet	Unlikely to occur. The study area lies outside this species' known geographic range.
<i>Allium atrorubens</i> var. <i>atrorubens</i> Great Basin onion	SCC	2B.3	May–Jun	Perennial bulbiferous herb found in rocky or sandy soil in Great Basin scrub and pinyon and juniper woodland; 2,315–7,595 feet	Unlikely to occur. The study area lies outside this species' elevation range and known geographic range.
<i>Astragalus cimae</i> var. <i>sufflatus</i> inflated Cima milk-vetch	SCC	1B.3	Apr–Jun	Perennial herb found in Great Basin scrub, sagebrush, pinyon and juniper woodland in rocky, limestone sites with carbontate/calcareous substrates; 4,987–6,759 feet	Unlikely to occur. The study area lies outside this species' elevation range and known geographic range.
<i>Astragalus inyoensis</i> Inyo milk-vetch	SCC	4.2	May–Jun	Perennial herb found in mostly volcanic, sometimes carbonate soils in Great Basin scrub and pinyon and juniper woodland; 4,500–9,150 feet	Unlikely to occur. The study area lies outside this species' known geographic range.
<i>Astragalus johannis-howellii</i> Long Valley milk-vetch	SCC	1B.2	(May) Jun–Aug	Perennial herb found in Great Basin scrub (sandy loam); 6,692–8,300 feet	Unlikely to occur. The study area lies outside this species known geographic range.
<i>Astragalus kentrophyta</i> var. <i>elatus</i> spiny-leaved milk-vetch	SCC	2B.2	Jun–Sep	Perennial herb found in subalpine coniferous forest (rocky, sometimes carbonate soil); 9,842–11,450 feet	Unlikely to occur. The study area lies outside this species' known geographic range.

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<i>Astragalus lemmonii</i> Lemmon's milk-vetch	SCC	1B.2	May–Aug (Sep)	Perennial herb found in Great Basin scrub, meadows and seeps, marshes, and swamps (lake shores); 3,303–7,244 feet	Unlikely to occur. The study area lies outside this species' known geographic range.
<i>Astragalus lentiginosus</i> var. <i>kernensis</i> Kern Plateau milk-vetch	SCC	1B.2	Jun–Jul	Perennial herb found in meadows, seeps, and subalpine coniferous forest in dry, gravelly or sandy slopes or flats, primarily in and around large meadows; 6,791–9,006 feet	Unlikely to occur. The study area lies outside this species' known geographic range.
<i>Astragalus monoensis</i> Mono milk-vetch	SCC	1B.2	Jun–Aug	Perennial herb found in pumice, gravelly or sandy soil in Great Basin scrub and upper montane coniferous forest; 3,355–11,005 feet	Unlikely to occur. The study area lies outside this species' known geographic range.
<i>Astragalus ravenii</i> Raven's milk-vetch	SCC	1B.3	Jul–Sept	Perennial herb found in alpine boulder and rock fields and upper montane coniferous forests on gravelly flats and slopes of metamorphosed sedimentary and volcanic bedrock, often near large nurse rocks; 10,892–12,106 feet	Unlikely to occur. The study area lies outside this species' elevation range and known geographic range.
<i>Astragalus serenoii</i> var. <i>shockleyi</i> Shockley's milk-vetch	SCC	2B.2	May–Jun	Open, dry alkaline gravelly clay, generally in sagebrush or pinyon pine; 3,773–7,546 feet	Unlikely to occur. The study area lies outside this species' elevation range and known geographic range.
<i>Astragalus subvestitus</i> Kern County milk-vetch	SCC	4.3	(May) Jun–Jul	Gravel and sand in sagebrush; 4,921–8,694 feet	Unlikely to occur. The study area lies outside this species' known geographic range.
<i>Boechea cobrensis</i> Masonic rockcress		2B.3	Jun–Jul	Perennial herb found in sandy soil in Great Basin scrub, and pinyon and juniper woodland; 3,105–10,185 feet	Unlikely to occur. The study area lies outside this species' known geographic range.

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<i>Boechera pendulina</i> rabbit-ear rockcress	SCC	2B.3	Jun–Jul	Perennial herb found in sandy, gravelly, or rocky (sometimes carbonate) soil in Great Basin scrub and pinyon and juniper woodland; 9,150–9,600 feet	Unlikely to occur. The study area lies outside this species' known geographic range.
<i>Boechera pinzliae</i> Pinzl's rockcress	SCC	1B.3	Jul	Perennial herb found in alpine boulder and rock field, and subalpine coniferous forest (scree or sandy); 9,842–10,990 feet	Unlikely to occur. The study area lies outside this species' known geographic range.
<i>Botrychium tunux</i> moosewort		2B.1	Aug–Sep	Perennial rhizomatous herb in calcareous alpine boulder and rock field; 10,000 feet	Unlikely to occur. The study area lies outside this species' known geographic range.
<i>Calochortus excavatus</i> Inyo County star-tulip	SCC	1B.1	Apr–Jul	Perennial bulbiferous herb found in alkaline, mesic soil in Chenopod scrub, and meadows and seeps; 3,772–6,561 feet	Unlikely to occur. The study area lies outside this species' known geographic range.
<i>Camissonia sierrae</i> ssp. <i>alticola</i> Mono Hot Springs evening-primrose		1B.2	May–Aug	Annual herb found in granitic, gravel and sand pans in lower montane coniferous forest and upper montane coniferous forest; 2,410–7,905 feet	Unlikely to occur. The study area lies outside this species' known geographic range.
<i>Calyptridium pygmaeum</i> pygmy pussypaws	SCC	1B.2	Jun–Aug	Annual herb found in sandy or gravelly soils in subalpine coniferous forest and upper montane coniferous forest; 5,814–9,330 feet	Unlikely to occur. The study area lies outside this species' known geographic range.
<i>Carex duriuscula</i> spikerush sedge	SCC	2B.3	Jul-Aug	Perennial rhizomatous herb found in Great Basin scrub and subalpine coniferous forest; 10,500–12,300 feet	Unlikely to occur. The study area lies outside this species' elevation range and known geographic range.
<i>Carex idahoa</i> Idaho sedge	SCC	2B.3	July	Perennial rhizomatous herb found in meadows and seeps and subalpine coniferous forest; 8,550–9,600 feet	Unlikely to occur. The study area lies outside this species' known geographic range.

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<i>Carex petasata</i> Liddon's sedge	SCC	2B.3	May–Jul	Perennial herb found in broadleaf upland forest, lower montane coniferous forest, meadows and seeps, and pinyon and juniper woodland; 1,963–10,892 feet	Unlikely to occur. The study area lies outside this species' known geographic range.
<i>Carex stevenii</i> Steven's sedge	SCC	2B.2	Aug	Perennial rhizomatous herb found along creeks, sometimes dry meadows and alpine boulder and rock fields; 8,550–10,155 feet	Unlikely to occur. The study area lies outside this species' known geographic range.
<i>Chaetadelpha wheeleri</i> Wheeler's dune-broom	SCC	2B.2	Apr–Sep	Perennial rhizomatous herb found in sandy soil in desert dunes, Great Basin scrub, and Mojavean desert scrub; 2,608–6,234 feet	Unlikely to occur. The study area lies outside this species' elevation range and known geographic range.
<i>Cinna bolanderi</i> Bolander's woodreed		1B.2	Jul–Sep	Perennial herb found in mesic stream sides of meadows, seeps, and upper montane coniferous forests; 5,479–8,005 feet	Unlikely to occur. The study area lies outside this species' known geographic range.
<i>Cordylanthus eremicus</i> ssp. <i>kernensis</i> Kern Plateau bird's-beak	SCC	1B.3	(May)Jul–Sep	Annual, hemiparasitic herb found in Great Basin scrub, Joshua tree woodland, pinyon and juniper woodland, and upper montane coniferous forest; 5,025–9,000 feet	Unlikely to occur. The study area lies outside this species' known geographic range.
<i>Crepis runcinata</i> ssp. <i>hallii</i> Hall's meadow hawksbeard	SCC	2B.2	May–Aug	Perennial herb found in mesic, alkaline soil in Mojavean desert scrub, and pinyon and juniper woodland; 1,591–7,125 feet	Unlikely to occur. The study area lies outside this species' elevation range and known geographic range.
<i>Cuniculotinus gramineus</i> Panamint rock-goldenrod	SCC	2B.3	Jun–Aug	Perennial herb found in carbonate, rocky soils in pinyon and juniper woodland and subalpine coniferous forest; 6,120–8,700 feet	Unlikely to occur. The study area lies outside this species' known geographic range.

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<i>Cusickiella quadricostata</i> Bodie Hills cusickiella		1B.2	May–Jul	Perennial herb found in clay or rocky soil in Great Basin scrub, and pinyon and juniper woodland; 2,800–9,185 feet	Unlikely to occur. The study area lies outside this species' known geographic range.
<i>Cymopterus globosus</i> globose cymopterus	SCC	2B.2	Mar–Jun	Perennial herb found in sandy, open flats in Great Basin scrub; 3,937–7,004 feet	Unlikely to occur. The study area lies outside this species' known geographic range.
<i>Dedeckera eurekensis</i> July gold	SCC	SR, 1B.3	May–Aug	Perennial deciduous shrub found in Mojavean desert scrub on carbonate soils; 3,645–6,600 feet	Unlikely to occur. The study area lies outside this species' elevation range and known geographic range.
<i>Draba asterophora</i> var. <i>asterophora</i> Tahoe draba		1B.2	Jul–Aug (Sep)	Perennial herb found in alpine boulder and rock field, and subalpine coniferous forest; 3,505–11,500 feet	Unlikely to occur. The study area lies outside this species' known geographic range.
<i>Draba californica</i> California draba	SCC	4.2	Jul–Aug	Perennial herb found in alpine boulder and rock field and meadows and seeps; 9,000–12,750 feet	Unlikely to occur. The study area lies outside this species' known geographic range.
<i>Draba sharsmithii</i> Mt. Whitney draba	SCC	1B.2	Jul–Aug	Perennial herb found in protected rock crevices of alpine boulder and rock fields and subalpine coniferous forest; 7,382–13,009 feet	Unlikely to occur. The study area lies outside this species' known geographic range.
<i>Dryopteris filix-mas</i> male fern	SCC	2B.3	Jul–Sep	Crevices of granitic cliffs; 7,874–10,170 feet	Unlikely to occur. The study area lies outside this species' known geographic range.
<i>Eremothera boothii</i> ssp. <i>boothii</i> Booth's evening-primrose		2B.3	Apr–Sep	Annual herb found in Joshua tree woodland, and pinyon and juniper woodland; 2,400–7,875 feet	Unlikely to occur. The study area lies outside this species' elevation range and known geographic range.

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<i>Eremothera boothii</i> ssp. <i>intermedia</i> Booth's hairy evening-primrose		2B.3	(May) Jun	Perennial herb found in Great Basin scrub (sandy), and pinyon and juniper woodland; 2,150–7,055 feet	Unlikely to occur. The study area lies outside this species' elevation range and known geographic range.
<i>Ericameria gilmanii</i> Gilman's goldenbush	SCC	1B.3	Aug–Sep	Perennial shrub found at the interface of pinyon and juniper woodland and subalpine forests and on rocky (generally limestone but also granite) sites in open coniferous forests; 6,890–11,155 feet	Unlikely to occur. The study area lies outside this species' known geographic range.
<i>Erigeron compactus</i> compact daisy	SCC	2B.3	May–Jul	Perennial herb found on rocky slopes in sagebrush, pinyon and juniper woodland, and alkali flats with carbonate soils; 5,906–7,546 feet	Unlikely to occur. The study area lies outside this species' known geographic range.
<i>Erigeron uncialis</i> var. <i>uncialis</i> limestone daisy	SCC	1B.2	May–Jul	Perennial herb found in crevices of limestone cliffs in Great Basin scrub, subalpine coniferous forest, and pinyon and juniper woodland; 6,234–9,514 feet	Unlikely to occur. The study area lies outside this species' known geographic range.
<i>Eriogonum mensicola</i> Pinyon Mesa buckwheat	SCC	1B.3	Jul–Oct	Perennial herb found on rocky slopes in sagebrush and pinyon and juniper woodland; 5,906–8,858 feet	Unlikely to occur. The study area lies outside this species' known geographic range.
<i>Eriogonum wrightii</i> var. <i>olanchense</i> Olancho Peak buckwheat	SCC	1B.3	Jul–Sep	Perennial herb found on dry, gravelly to rocky places and open areas at the base of boulders in subalpine coniferous forest and alpine boulder and rock fields; 10,696–11,598 feet	Unlikely to occur. The study area lies outside this species' elevation range and known geographic range.
<i>Eriophyllum nubigenum</i> Yosemite woolly sunflower		1B.3	May–Aug	Annual herb found in gravelly and granitic soils of chaparral, lower montane coniferous forest, and upper montane coniferous forest; 5,003–9,022 feet	Unlikely to occur. The study area lies outside this species' known geographic range.

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<i>Erythranthe utahensis</i> Utah monkeyflower		2B.1	Apr	Perennial rhizomatous herb found in meadows and seeps, pinyon and juniper woodland; 2,000–6,560 feet	Unlikely to occur. The study area lies outside this species' elevation range and known geographic range.
<i>Goodmania luteola</i> golden goodmania	SCC	4.2	Apr–Aug	Annual herb found in alkaline or clay soil in Mojavean desert scrub, meadows and seeps, playas, and valley and foothill grassland; 65–7,217 feet	Unlikely to occur. The study area lies outside this species' elevation range and known geographic range.
<i>Greeneocharis circumscissa</i> var. <i>rosulata</i> rosette cushion cryptantha	SCC	1B.2	Jul–Aug	Annual herb found in gravelly (coarse), granitic soil in alpine boulder and rock field and subalpine coniferous forest; 9,678–12,008 feet	Unlikely to occur. The study area lies outside this species' known geographic range.
<i>Grusonia pulchella</i> beautiful cholla	SCC	2B.2	May (Jun)	Perennial stem succulent found on the borders of dry lakes and sandy flats; 4,921–5,577 feet	Unlikely to occur. The study area lies outside this species' elevation range and known geographic range.
<i>Hackelia brevicula</i> Poison Canyon stickseed	SCC	3.3	Jul	Perennial herb found on open slopes, dry streambeds, and rocky slopes of open aspen stands and sagebrush and alpine habitats; 8,858–10,335 feet	Unlikely to occur. The study area lies outside this species' known geographic range.
<i>Hackelia sharsmithii</i> Sharsmith's stickseed	SCC	2B.3	Jul–Aug	Perennial herb found in crevices in cliffs, talus slopes, and the shade of large boulders; 10,335–12,139 feet	Unlikely to occur. The study area lies outside this species' elevation range and known geographic range.
<i>Hesperidanthus jaegeri</i> Jaeger's hesperidanthus	SCC	1B.2	May–Jul	Perennial herb found in shady, rocky, limestone crevices in Great Basin scrub, pinyon and juniper woodland, and subalpine coniferous forest; 7,005–9,186 feet	Unlikely to occur. The study area lies outside this species' known geographic range.
<i>Hulsea brevifolia</i> short-leaved hulsea	SCC	1B.2	May–Aug	Perennial herb in granitic or volcanic, gravelly or sandy soils, in upper and lower montane coniferous forest; 4,921–10,499 feet	Unlikely to occur. The study area lies outside this species' known geographic range.

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<i>Hulsea vestita</i> ssp. <i>inyoensis</i> Inyo hulsea	SCC	2B.2	Apr–Jun	Perennial herb found in rocky soil in Chenopod scrub, Great Basin scrub, and pinyon and juniper woodland; 5,393–9,842 feet	Unlikely to occur. The study area lies outside this species' known geographic range.
<i>Ivesia campestris</i> field ivesia	SCC	1B.2	Jul–Sep	Perennial herb found on meadow edges; 7,218–10,171 feet	Unlikely to occur. The study area lies outside this species' known geographic range.
<i>Ivesia kingii</i> var. <i>kingii</i> alkali ivesia	SCC	2B.2	May–Aug	Perennial herb found in mesic, alkaline, and clay soils in Great Basin scrub, meadows and seeps, and playas; 3,937–6,988 feet	Unlikely to occur. The study area lies outside this species' elevation range and known geographic range.
<i>Ladeania lanceolata</i> lance-leaved scurf-pea	SCC	2B.3	Apr–Aug	Perennial rhizomatous herb found in sandy soil in Great Basin scrub; 4,000–8,200 feet	Unlikely to occur. The study area lies outside this species' known geographic range.
<i>Lewisia disepala</i> Yosemite lewisia		1B.2	Mar–Jun	Perennial herb found in granitic or sandy soil in upper and lower montane coniferous forest, pinyon and juniper woodland; 3396–11,483 feet	Unlikely to occur. The study area lies outside this species' known geographic range.
<i>Lomatium foeniculaceum</i> ssp. <i>inyoense</i> Inyo lomatium	SCC	4.3	Jun–Jul	Perennial herb found on open summits and subalpine scrub; 7,201–10,499 feet	Unlikely to occur. The study area lies outside this species' known geographic range.
<i>Lupinus duranii</i> Mono Lake lupine		1B.2	May–Aug	Perennial herb found in volcanic pumice, gravelly soil in Great Basin scrub, subalpine coniferous forest, and upper montane coniferous forest; 3,000–9,845 feet	Unlikely to occur. The study area lies outside this species' known geographic range.

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<i>Lupinus padre-crowleyi</i> Father Crowley's lupine	SCC	SR, 1B.2	Jul–Aug	Perennial herb found on decomposed granite in Great Basin scrub, riparian scrub, riparian forest, and upper montane coniferous forest scattered on steep avalanche chutes, in sunny sites in drainages, and in valley bottoms; 8,990–10,909 feet	Unlikely to occur. The study area lies outside this species' known geographic range.
<i>Mentzelia inyoensis</i> Inyo blazing star	SCC	1B.3	Apr–Oct	Annual herb found in rocky sites, washes, calcareous pumice sand, and clayey hillsides of Great Basin scrub, pinyon and juniper woodland; 3,789–6,496 feet	Unlikely to occur. The study area lies outside this species' elevation range and known geographic range.
<i>Mentzelia torreyi</i> Torrey's blazing star	SCC	2B.2	Jun–Aug	Perennial herb found in sandy or rocky, alkaline, usually volcanic soil in Great Basin scrub, Mojavean desert scrub, and pinyon and juniper woodland; 2,835–9,300 feet	Unlikely to occur. The study area lies outside this species' known geographic range.
<i>Monardella beneolens</i> sweet-smelling monardella	SCC	1B.3	Jun–Sep	Perennial rhizomatous herb found in granitic soils of alpine boulder and rock fields, subalpine coniferous forest, upper montane coniferous forest, and open conifer forests; 8,202–11,598 feet	Unlikely to occur. The study area lies outside this species' known geographic range.
<i>Oreocarya roosiorum</i> bristlecone cryptantha	SCC	SR, 1B.2	Jun–Jul	Perennial herb found on carbonate substrates (gentle slopes or flats of dolomite or limestone formations) of subalpine coniferous forest (bristlecone pine/limber pine); 9,547–10,597 feet	Unlikely to occur. The study area lies outside this species' known geographic range.
<i>Oxytropis deflexa</i> var. <i>sericea</i> blue pendant-pod oxytrope	SCC	2B.1	Jun–Aug	Perennial herb found in moist meadows, seeps, and forest openings; 9,186–10,499 feet	Unlikely to occur. The study area lies outside this species' known geographic range.

Scientific/Common Name ^a	Federal Status ^b	State Status and CRPR Rank ^c	Blooming Period ^d	Habitat	Likelihood for Occurrence Within Study Area ^{e,f} and Occurrence Notes
<i>Parnassia parviflora</i> small-flowered grass-of-Parnassus		2B.2	Aug–Sep	Perennial herb found in meadows and seeps; 6,562–9,367 feet	Unlikely to occur. The study area lies outside this species' known geographic range.
<i>Penstemon calcareus</i> limestone beardtongue	SCC	1B.3	Apr–May	Perennial herb found on carbonate soil in xeric shrub/blackbrush, limestone crevices, rocky slopes in pinyon and juniper woodland, and Joshua tree scrub; 3,937–5,249 feet	Unlikely to occur. The study area lies outside this species' elevation range and known geographic range and it contains no suitable habitat for this species.
<i>Petrophytum caespitosum</i> ssp. <i>acuminatum</i> marble rockmat	SCC	1B.3	Jun–Sep	Perennial evergreen shrub found on rocky sites (limestone cliffs) in lower montane coniferous forest and upper montane coniferous forest; 3,035–7,513 feet	Unlikely to occur. The study area lies outside this species' known geographic range.
<i>Phacelia inyoensis</i> Inyo phacelia	SCC	1B.2	Apr–Aug	Annual herb found in meadows and seeps (alkaline); 3,000–10,498 feet	Unlikely to occur. The study area lies outside this species' known geographic range.
<i>Phacelia monoensis</i> Mono County phacelia	SCC	1B.1	May–Jul	Annual herb found in clay soil, often on roadsides in Great Basin scrub, and pinyon and juniper woodland; 6,233–9,514 feet	Unlikely to occur. The study area lies outside this species' known geographic range.
<i>Phacelia nashiana</i> Charlotte's phacelia	SCC	1B.2	Feb–Jun	Annual herb found on sandy to rocky east-facing slopes, generally in Joshua tree woodland, pinyon and juniper woodland, or xeric shrub/blackbrush; less than 7,874 feet	Unlikely to occur. The study area lies outside this species' known geographic range and it contains no suitable habitat for this species.
<i>Physaria ludoviciana</i> silver bladderpod	SCC	2B.2	May–Jun	Perennial herb found in Great Basin scrub; 7,053 feet	Unlikely to occur. The study area lies outside this species' known geographic range.

Scientific/Common Name ^a	Federal Status ^b	State Status and CRPR Rank ^c	Blooming Period ^d	Habitat	Likelihood for Occurrence Within Study Area ^{e,f} and Occurrence Notes
<i>Physocarpus alternans</i> Nevada ninebark	SCC	2B.3	Jun–Jul	Perennial deciduous shrub found on limestone outcrops, rocky calcareous canyon walls, and dry rocky pinyon and juniper woodland; 5,905–10,170 feet	Unlikely to occur. The study area lies outside this species' known geographic range.
<i>Plagiobothrys parishii</i> Parish's popcornflower	SCC	1B.1	Mar–Jun (Nov)	Annual herb found in alkaline, mesic soil in Great Basin scrub and Joshua tree woodland; 2,460–4,593 feet	Unlikely to occur. The study area lies outside this species' known geographic range.
<i>Polemonium chartaceum</i> Mason's sky pilot	SCC	1B.3	Jun–Aug	Perennial herb found on gravelly slopes and rocky ledges on granitic or volcanic soils in alpine boulder and rock fields, and subalpine coniferous forest; 10,794–14,009 feet	Unlikely to occur. The study area lies outside this species' elevation range and known geographic range.
<i>Polystenium williamsiae</i> Williams' combleaf	SCC	1B.2	Mar–Jun	Perennial herb found in saline soils of alkali playas, marshes, swamps, vernal pool edges, lake margins, meadows, swales, mud flats, dry streambeds, and gravel bars of sagebrush scrub and pinyon and juniper woodland; 3,281–8,202 feet	Unlikely to occur. The study area lies outside this species' known geographic range.
<i>Populus angustifolia</i> narrow-leaved cottonwood	SCC	2B.2	Mar–Apr	Perennial deciduous tree that occurs on stream sides; 3,937–5,906 feet	Unlikely to occur. The study area lies outside this species' elevation range and known geographic range.
<i>Potentilla morefieldii</i> Morefield's cinquefoil	SCC	1B.3	Jul–Aug	Perennial herb found in limestone soils of alpine boulder and rock fields; 10,712–13,123 feet	Unlikely to occur. The study area lies outside this species' elevation range and known geographic range.
<i>Potentilla pulcherrima</i> beautiful cinquefoil	SCC	2B.2	Jul–Aug	Perennial herb found on dry edges of meadows and streams; 9,843–10,171 feet	Unlikely to occur. The study area lies outside this species' known geographic range.

Scientific/Common Name ^a	Federal Status ^b	State Status and CRPR Rank ^c	Blooming Period ^d	Habitat	Likelihood for Occurrence Within Study Area ^{e,f} and Occurrence Notes
<i>Ranunculus hydrocharoides</i> frog's-bit buttercup	SCC	2B.1	Jun–Aug	Perennial herb (aquatic) found in wet ground, shallow water, creek edges, and lakes; 3,937–9,186 feet	Unlikely to occur. The study area lies outside this species' known geographic range.
<i>Sclerocactus polyancistrus</i> Mojave fish-hook cactus	SCC	4.2	Apr–Jun	Perennial stem succulent found in limestone areas, hills and canyons, alluvial slopes of sagebrush, xeric shrub/blackbrush, creosote bush scrub, and Joshua tree woodland; 2,461–6,890 feet	Unlikely to occur. The study area lies outside this species' elevation range and known geographic range.
<i>Solorina spongiosa</i> fringed chocolate chip lichen	SCC	2B.2	NA	Crustose lichen (terricolous) found in moist calcareous habitats, meadows and seeps, and subalpine coniferous forest; approximately 9,500 feet	Unlikely to occur. The study area lies outside this species' known geographic range.
<i>Sphaeromeria potentilloides</i> var. <i>nitrophila</i> alkali tansy-sage	SCC	2B.2	Jun–Jul	Perennial herb found in usually alkaline soil in meadows and seeps, and playas; 6,889–7,874 feet	Unlikely to occur. The study area contains no suitable habitat for this species.
<i>Sphenopholis obtusata</i> prairie wedge grass	SCC	2B.2	Apr–Jul	Perennial herb found in mesic soil in cismontane woodland, and meadows and seeps; 984–6,561 feet	Unlikely to occur. The study area lies outside the species known geographic range and contains no suitable habitat for this species.
<i>Stipa divaricata</i> small-flowered ricegrass	SCC	2B.3	Jun–Sep	Perennial herb found on gravel benches, rocky slopes, and creek banks; 2,625–10,171 feet	Unlikely to occur. The study area lies outside this species' known geographic range.
<i>Streptanthus gracilis</i> alpine jewelflower	SCC	1B.3	Jul–Sep	Annual herb found in gravel pockets among granitic outcrops and talus boulders of subalpine coniferous forest and upper montane coniferous forest; 9,186–11,483 feet	Unlikely to occur. The study area lies outside this species' known geographic range.

Scientific/Common Name ^a	Federal Status ^b	State Status and CRPR Rank ^c	Blooming Period ^d	Habitat	Likelihood for Occurrence Within Study Area ^{e,f} and Occurrence Notes
<i>Streptanthus oliganthus</i> Masonic Mountain jewelflower	SCC	1B.2	Jun–Jul	Perennial herb found in volcanic or granitic, rocky soil in pinyon and juniper woodland; 3,050–10,005 feet	Unlikely to occur. The study area lies outside the species' known geographic range and contains no suitable habitat for this species.
<i>Taraxacum ceratophorum</i> horned dandelion	SCC	2B.1	Jun–Aug	Annual herb found in moist alpine meadows; 9,514–10,171 feet	Unlikely to occur. The study area lies outside this species' known geographic range.
<i>Tetradymia tetrameres</i> dune horsebrush	SCC	2B.2	(Jul) Aug	Perennial herb found in sandy soil in Great Basin scrub; 3,937–7,004 feet	Unlikely to occur. The study area contains no suitable habitat for this species.
<i>Thelypodium integrifolium</i> ssp. <i>complanatum</i> foxtail thelypodium	SCC	2B.2	Jun–Oct	Perennial herb found in alkaline or subalkaline, mesic soils in Great Basin scrub, and meadows and seeps; 2,500–8,200 feet	Unlikely to occur. The study area lies outside the species' known elevation range and it contains no suitable habitat for this species.
<i>Thelypodium milleflorum</i> many-flowered thelypodium	SCC	2B.2	Apr–Jun	Perennial herb found in Chenopod scrub and Great Basin scrub (sandy); 4,002–8,202 feet	Unlikely to occur. The study area contains no suitable habitat for this species.
<i>Townsendia leptotes</i> slender townsendia	SCC	2B.3	Jun–Jul	Perennial herb found on alpine rocky or sandy slopes; 11,483–12,467 feet	Unlikely to occur. The study area lies outside this species' elevation range and known geographic range.
<i>Transberingia bursifolia</i> ssp. <i>virgata</i> virgate halimolobos	SCC	2B.3	May–Jul	Perennial herb found in meadows, near alpine groves, and in pinyon and juniper woodland; 6,562–12,139 feet	Unlikely to occur. The study area lies outside this species' known geographic range.
<i>Trichophorum pumilum</i> little bulrush	SCC	2B.2	Aug	Perennial rhizomatous herb found in riverbanks, carbonate soil in bogs and fens, marshes and swamps, and riparian scrub; 9,383–10,662 feet	Unlikely to occur. The study area contains no suitable habitat for this species.

Scientific/Common Name ^a	Federal Status ^b	State Status and CRPR Rank ^c	Blooming Period ^d	Habitat	Likelihood for Occurrence Within Study Area ^{e,f} and Occurrence Notes
<i>Trifolium dedeckerae</i> Dedecker's clover	SCC	1B.3	May–Jul	Perennial herb found in gravelly canyons and slopes, cracks in granite rock outcrops, and understory of pinyon pines in pinyon and juniper woodland, subalpine coniferous forest, upper montane coniferous forest, and lower montane coniferous forest; 6,890–11,483 feet	Unlikely to occur. The study area lies outside this species' known geographic range.

CRPR = California Rare Plant Rank; NA = not applicable; study area = Botanical Resources Study Area

^a The following USGS 7.5-minute topographic quadrangles were queried for special status plant species: Tioga Pass, Mount Dana, Lee Vining, Falls Ridge, Lundy, Dunderberg Peak, Vogelsang Peak, Koip Peak, Matterhorn Peak, and Tenaya Lake.

^b The source of the Inyo National Forest status is the *List of Botany At Risk Species* (NRM – TES/IS, 2018).

^c The source for the State Status and CRPR rank is the *Special Vascular Plants, Bryophytes, and Lichens List* (CDFW, 2021).

^d Parentheses enclose blooming periods that are rare to uncommon.

^e Occurrence information provided by the Consortium of California Herbaria (CCH, 2021); number in parentheses is the accession number.

^f The Botanical Resources Study Area includes the FERC Project Boundary plus a 200-foot buffer extending from the reservoir behind Saddlebag Dam to the Poole Powerhouse tailrace.

^g This species is not reported in the Jepson eflora except as a note under the treatment for ochre-flowered buckwheat (*Eriogonum ochrocephalum* var. *ochrocephalum*) indicating that it occurs in Nevada near the Mono County line and is unknown from California (Jepson Flora Project, 2022).

Federal Status

Threatened = Listed as Threatened under the Endangered Species Act

Inyo National Forest

SCC = Species of Conservation Concern

State Status

SR = State Rare

California Rare Plant Rank (CRPR)

1B = Plants Rare, Threatened, or Endangered in California and elsewhere

2B = Plants Rare, Threatened, or Endangered in California but more common elsewhere

3 = Plants for which we need more information–Review List

4 = Plants of limited distribution–A Watch List

CRPR Threat Code Extensions

.1 = Seriously threatened in California (over 80% of occurrences threatened; high degree and immediacy of threat)

.2 = Fairly threatened in California (20–80% of occurrences threatened; moderate degree and immediacy of threat)

.3 = Not very threatened in California (<20% of occurrences threatened; low degree and immediacy of threat or no current threats known)

Table B-2. Invasive Plants Potentially Occurring in the Botanical Resources Study Area

Scientific Name	Common Name	USFS Treatment Strategy	Cal-IPC Rank
<i>Agrostis stolonifera</i>	creeping bent		Limited
<i>Ailanthus altissima</i>	tree of heaven	1: Eradicate	Moderate
<i>Alhagi maurorum</i>	camel thorn		Moderate
<i>Arundo donax</i>	giant reed		High
<i>Asparagus asparagoides</i>	bridal creeper		Moderate
<i>Avena barbata</i>	slender wild oat		Moderate
<i>Avena fatua</i>	wild oat		Moderate
<i>Bassia hyssopifolia</i>	five-hook bassia	3: Contain	Limited
<i>Brassica nigra</i>	black mustard		Moderate
<i>Brassica rapa</i>	field mustard		Limited
<i>Brassica tournefortii</i>	Sahara mustard		High
<i>Bromus diandrus</i>	ripgut grass		Moderate
<i>Bromus hordeaceus</i>	soft chess	4: Limited or None	Limited
<i>Bromus japonicus</i>	Japanese brome	4: Limited or None	Limited
<i>Bromus rubens</i>	red brome	3: Contain	High
<i>Bromus tectorum</i>	cheat grass	3: Contain	High
<i>Centaurea diffusa</i>	diffuse knapweed	1: Eradicate	Moderate
<i>Centaurea melitensis</i>	totalote		Moderate
<i>Centaurea solstitialis</i>	yellow star-thistle	1: Eradicate	High
<i>Centaurea stoebe</i> ssp. <i>micranthos</i>	spotted knapweed	1: Eradicate	High
<i>Chorizpora tenella</i>	crossflower	4: Limited or None	
<i>Cirsium arvense</i>	Canada thistle	1: Eradicate	Moderate
<i>Cirsium vulgare</i>	bull thistle	3: Contain	Moderate
<i>Conium maculatum</i>	poison-hemlock		Moderate
<i>Convolvulus arvensis</i>	bindweed	3: Contain	
<i>Cortaderia selloana</i>	pampas grass		High
<i>Cynodon dactylon</i>	Bermuda grass		Moderate
<i>Dactylis glomerata</i>	orchard grass		Limited
<i>Descurainia sophia</i>	tansy mustard	4: Limited or None	Limited
<i>Dipsacus fullonum</i>	wild teasel	2: Control	Moderate

Scientific Name	Common Name	USFS Treatment Strategy	Cal-IPC Rank
<i>Dipsacus sativus</i>	Fuller's teasel		Moderate
<i>Elaeagnus angustifolia</i>	Russian olive	2: Control	Moderate
<i>Elymus caput-medusae</i>	medusa head		High
<i>Erodium cicutarium</i>	redstem filaree	4: Limited or None	Limited
<i>Fallopia sachalinensis</i>	giant knotweed		Moderate
<i>Festuca arundinacea</i>	tall fescue		Moderate
<i>Festuca myuros</i>	rattail sixweeks grass	4: Limited or None	Moderate
<i>Festuca perennis</i>	rye grass		Moderate
<i>Foeniculum vulgare</i>	fennel		Moderate
<i>Geranium purpureum</i>	little robin		Limited
<i>Grindelia squarrosa</i> var. <i>serrulate</i>	curlycup gumweed	4: Limited or None	
<i>Halogeton glomeratus</i>	saltlover	2: Control	Moderate
<i>Helminthotheca echioides</i>	bristly ox-tongue		Limited
<i>Hirschfeldia incana</i>	short-pod mustard	3: Contain	Moderate
<i>Holcus lanatus</i>	common velvet grass	3: Contain	Moderate
<i>Hordeum marinum</i>	Mediterranean barley	4: Limited or None	Moderate
<i>Hordeum murinum</i>	wall barley		Moderate
<i>Lactuca serriola</i>	prickly lettuce	4: Limited or None	
<i>Lathyrus latifolius</i>	perennial sweet pea		Watch
<i>Lepidium appelianum</i>	white-top	1: Eradicate	Limited
<i>Lepidium chalepense</i>	lens-podded hoary cress	1: Eradicate	Moderate
<i>Lepidium draba</i>	heart-podded hoary cress	1: Eradicate	Moderate
<i>Lepidium latifolium</i>	perennial pepperweed	1: Eradicate	High
<i>Leucanthemum vulgare</i>	ox-eye daisy		Moderate
<i>Linaria dalmatica</i> ssp. <i>dalmatica</i>	dalmatian toadflax	1: Eradicate	Moderate
<i>Linaria vulgaris</i>	butter-and-eggs	1: Eradicate	Moderate
<i>Lotus corniculatus</i>	bird's-foot trefoil	3: Contain	
<i>Malva neglecta</i>	common mallow	4: Limited or None	
<i>Marrubium vulgare</i>	horehound	3: Contain	Limited
<i>Melilotus</i> spp.	sweetclover	3: Contain	
<i>Penstemon subglaber</i>	smooth penstemon	3: Contain	
<i>Poa bulbosa</i>	bulbous bluegrass	4: Limited or None	

Scientific Name	Common Name	USFS Treatment Strategy	Cal-IPC Rank
<i>Polygonum aviculare</i>	knotweed	4: Limited or None	
<i>Polygonum aviculare</i> ssp. <i>depressum</i>	oval-leaf knotweed	4: Limited or None	
<i>Polypogon monspeliensis</i>	rabbitfoot grass	4: Limited or None	Limited
<i>Ranunculus testiculata</i>	curveseed butterwort	4: Limited or None	
<i>Rhaponticum repens</i>	Russian knapweed	1: Eradicate	Moderate
<i>Robinia pseudoacacia</i>	black locust	3: Contain	Limited
<i>Rubus armeniacus</i>	Himalayan blackberry	2: Control	High
<i>Rumex crispus</i>	curly dock	4: Limited or None	Limited
<i>Salsola tragus</i>	Russian thistle	3: Contain	Limited
<i>Saponaria officinalis</i>	bouncingbet	2: Control	Limited
<i>Schismus arabicus</i>	Arabian schismus	4: Limited or None	Limited
<i>Sisymbrium altissimum</i>	tumble mustard	4: Limited or None	
<i>Sonchus oleraceus</i>	common sow thistle	3: Contain	
<i>Spartium junceum</i>	Spanish broom	1: Eradicate	High
<i>Spergularia rubra</i>	red sand-spurry	4: Limited or None	
<i>Tamarix ramosissima</i>	saltcedar	2: Control	High
<i>Taraxacum officinale</i>	common dandelion	4: Limited or None	
<i>Tragopogon dubius</i>	yellow salsify	4: Limited or None	
<i>Tribulus terrestris</i>	puncturevine	2: Control	Limited
<i>Trifolium repens</i>	white clover	4: Limited or None	
<i>Ulmus pumila</i>	Siberian elm	2: Control	
<i>Verbascum thapsus</i>	woolly mullein	4: Limited or None	Limited

Cal-IPC = California Invasive Plant Council; USFS = U.S. Forest Service

Table B-3. Invasive Species of Concern to be Mapped in the Botanical Resources Study Area

Scientific Name	Common Name	USFS Treatment Strategy	Cal-IPC Rank
<i>Ailanthus altissima</i>	tree of heaven	1: Eradicate	Moderate
<i>Bassia hyssopifolia</i>	five-hook bassia	3: Contain	Limited
<i>Bromus rubens</i>	red brome	3: Contain	High
<i>Bromus tectorum</i>	cheat grass	3: Contain	High
<i>Centaurea diffusa</i>	diffuse knapweed	1: Eradicate	Moderate
<i>Centaurea solstitialis</i>	yellow star-thistle	1: Eradicate	High
<i>Centaurea stoebe</i> ssp. <i>micranthos</i>	spotted knapweed	1: Eradicate	High
<i>Cirsium arvense</i>	Canada thistle	1: Eradicate	Moderate
<i>Cirsium vulgare</i>	bull thistle	3: Contain	Moderate
<i>Convolvulus arvensis</i>	bindweed	3: Contain	
<i>Dipsacus fullonum</i>	wild teasel	2: Control	Moderate
<i>Elaeagnus angustifolia</i>	Russian olive	2: Control	Moderate
<i>Halogeton glomeratus</i>	saltlover	2: Control	Moderate
<i>Holcus lanatus</i>	common velvet grass	3: Contain	Moderate
<i>Lepidium appelianum</i>	white-top	1: Eradicate	
<i>Lepidium chalepense</i>	lens-podded hoary cress	1: Eradicate	Moderate
<i>Lepidium draba</i>	heart-podded hoary cress	1: Eradicate	Moderate
<i>Lepidium latifolium</i>	perennial pepperweed	1: Eradicate	High
<i>Linaria dalmatica</i> ssp. <i>dalmatica</i>	dalmatian toadflax	1: Eradicate	Moderate
<i>Linaria vulgaris</i>	butter-and-eggs	1: Eradicate	Moderate
<i>Rhaponticum repens</i>	Russian knapweed	1: Eradicate	Moderate
<i>Robinia pseudoacacia</i>	black locust	3: Contain	Limited
<i>Rubus armeniacus</i>	Himalayan blackberry	2: Control	High
<i>Salsola tragus</i>	Russian thistle	3: Contain	Limited
<i>Saponaria officinalis</i>	bouncingbet	2: Control	Limited
<i>Spartium junceum</i>	Spanish broom	1: Eradicate	High
<i>Tamarix ramosissima</i>	saltcedar	2: Control	High
<i>Tribulus terrestris</i>	puncturevine	2: Control	Limited
<i>Ulmus pumila</i>	Siberian elm	2: Control	

Cal-IPC = California Invasive Plant Council; USFS = U.S. Forest Service

APPENDIX C

CALIFORNIA NATIVE SPECIES FIELD SURVEY FORMS

CNDDDB Online Field Survey Form Report



California Natural Diversity Database
Department of Fish and Wildlife
1416 9th Street, Suite 1266
Sacramento, CA 95814
Fax: 916.324.0475
cnddb@wildlife.ca.gov
www.dfg.ca.gov/biogeodata/cnddb/



Source code RUD22F0005
Quad code 3711983
Occ. no. _____
EO index no. _____
Map index no. _____

This data has been reported to the CNDDDB, but may not have been evaluated by the CNDDDB staff

Scientific name: *Agrostis humilis*

Common name: mountain bent grass

Date of field work (mm-dd-yyyy): 08-19-2022

Comment about field work date(s): Surveys performed 7/18-7/22 and 8/15-8/19 in 2022

OBSERVER INFORMATION

Observer: Allison D. Rudalevige

Affiliation: Psomas

Address: 5 Hutton Centre Drive, Suite 300, Santa Ana, CA 92707

Email: allison.rudalevige@psomas.com

Phone: (714) 325-0129

Other observers: Sandra Leatherman

DETERMINATION

Keyed in: Jepson eFlora (2022)

Compared w/ specimen at:

Compared w/ image in:

By another person:

Other:

Identification explanation:

Identification confidence: *Confident*

Species found: *Yes* If not found, why not?

Level of survey effort: Pedestrian surveys following Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities (CDFW, 2018). Large population sizes estimated.

Total number of individuals: 854

Collection? *Yes*

Collection number: SJL 1347

Museum/Herbarium: University of California, Riverside Herbarium

PLANT INFORMATION

Phenology:	10 %	0 %	90 %
	vegetative	flowering	fruiting

SITE INFORMATION

Habitat description: Growing in relatively barren areas along the lakeshore and below Saddlebag Dam, sometimes among scattered boulders and cobbles. Associated species include *Agrostis scabra*, *Carex abrupta*, *Calyptridium umbellatum*, *Penstemon newberryi*, *Solidago multiradiata*, and *Oreostemma alpinum* var. *andersonii*.

Slope: gently sloping

Land owner/manager: Inyo National Forest

Aspect: varies

Site condition + population viability: *Good*

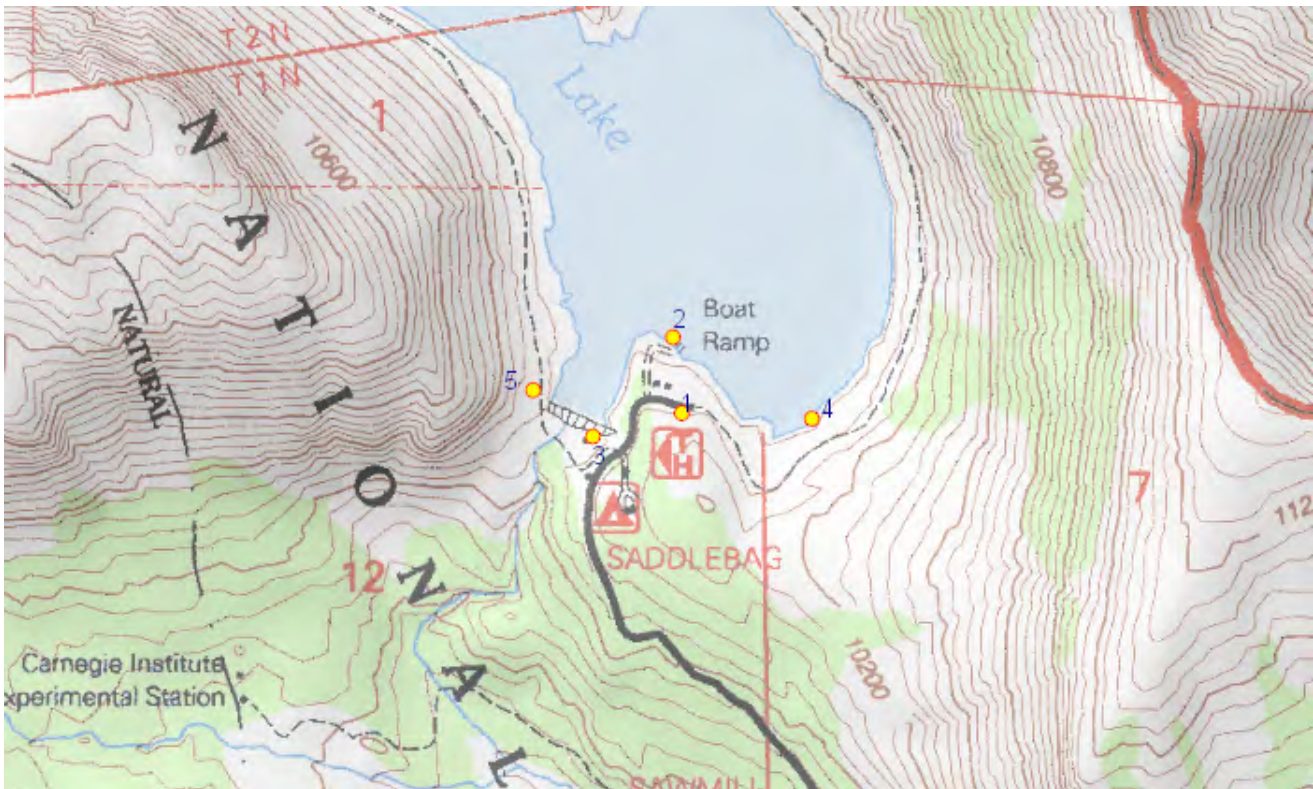
Immediate & surrounding land use: Undeveloped open space, Saddlebag Lake, Saddlebag Dam, campground and recreational uses

Visible disturbances: recreational activity

Threats: recreational activity

General comments: Reservoir levels fluctuate within and between years.

MAP INFORMATION



ID	County	24K Quadrangle	Elev. (ft)	Latitude NAD83	Longitude NAD83	UTM E NAD83	UTM N NAD83	UTM Zone
	Mono	Tioga Pass	10124	37.96562	-119.27079	300524	4204433	11
1	Public Land Survey	Feature Comment						
	M T01N R24E 12	Population 1; 106 individuals						
ID	County	24K Quadrangle	Elev. (ft)	Latitude NAD83	Longitude NAD83	UTM E NAD83	UTM N NAD83	UTM Zone
	Mono	Tioga Pass	10064	37.96699	-119.27100	300510	4204586	11
2	Public Land Survey	Feature Comment						
	M T01N R24E 12	Population 2; 500 individuals						
ID	County	24K Quadrangle	Elev. (ft)	Latitude NAD83	Longitude NAD83	UTM E NAD83	UTM N NAD83	UTM Zone
	Mono	Tioga Pass	10072	37.96520	-119.27283	300344	4204391	11
3	Public Land Survey	Feature Comment						
	M T01N R24E 12	Population 3; 48 individuals						
ID	County	24K Quadrangle	Elev. (ft)	Latitude NAD83	Longitude NAD83	UTM E NAD83	UTM N NAD83	UTM Zone
	Mono	Tioga Pass	10068	37.96552	-119.26781	300786	4204416	11
4	Public Land Survey	Feature Comment						
	M T01N R25E 7	Population 5; 100 individuals						

ID	County	24K Quadrangle	Elev. (ft)	Latitude NAD83	Longitude NAD83	UTM E NAD83	UTM N NAD83	UTM Zone
	Mono	Tioga Pass	10104	37.96603	-119.27421	300225	4204487	11
5	Public Land Survey	Feature Comment						
	M T01N R24E 12	Population 4; 100 individuals						

The mapped feature is accurate within: [20 m](#)

Source of mapped feature: [Garmin handheld GPS](#)

Mapping notes: [Data on individual populations included in attachments.](#)

Location/directions comments:

Attachment(s): [Agrostis humilis.kmz](#)

APPENDIX D PLANT COMPENDIUM

Species ^a	Common Name	SD	RD	TD	PP	SM	JC	EC	EO	TC
PTERIDOPHYTES – FERNS AND FERN ALLIES										
PTERIDACEAE – BRAKE FAMILY										
<i>Cryptogramma acrostichoides</i>	American parsley fern	x		x						
<i>Pelleae breweri</i>	Brewer's cliff-brake	x					x	x		
SELLAGINELLACEAE – SPIKE-MOSS FAMILY										
<i>Selaginella watsonii</i>	Watson's spike-moss	x	x	x		x	x	x	x	
WOODSIACEAE – CLIFF FERN FAMILY										
<i>Cystopteris fragilis</i>	brittle fragile fern	x								
GYMNOSPERMS – CONIFERS										
CUPRESSACEAE – CYPRESS FAMILY										
<i>Juniperus communis</i>	common juniper		x	x						
<i>Juniperus occidentalis</i>	western juniper		x	x						
PINACEAE – PINE FAMILY										
<i>Abies concolor</i>	white fir				x		x			x
<i>Pinus albicaulis</i> (federally Threatened)	whitebark pine	x	x	x		x		x		x
<i>Pinus contorta</i> ssp. <i>murrayana</i>	lodgepole pine	x	x	x		x	x	x		x
<i>Pinus jeffreyi</i>	Jeffrey pine				x					
EUDICOTS – FLOWERING PLANTS										
APIACEAE – CARROT FAMILY										
<i>Angelica capitellata</i>	ranger's buttons	x	x	x	x ^d		x	x		
<i>Cymopterus terebinthinus</i>	turpentine cymopterus	x				x				
<i>Ligusticum grayi</i>	Gray's ligusticum	x								
<i>Perideridia parishii</i>	Parish's yampah	x				x		x		
APOCYNACEAE – DOGBANE FAMILY										
<i>Apocynum androsaemifolium</i>	bitter dogbane				x					
ASTERACEAE – SUNFLOWER FAMILY										
<i>Achillea millefolium</i>	common yarrow	x	x			x	x	x		
<i>Agoseris monticola</i>	Sierra Nevada agoseris	x								

Species ^a	Common Name	SD	RD	TD	PP	SM	JC	EC	EO	TC
<i>Agoseris cf. parviflora</i>	Steppe agoseris		x							
<i>Ambrosia</i> sp. ^d	ragweed				x					
<i>Antennaria media</i>	Rocky Mountain pussy-toes		x	x	x	x	x	x		x
<i>Antennaria pulchella</i> (CRPR 4.3)	beautiful pussy-toes	x				x	x			x
<i>Antennaria rosea</i> ssp. <i>rosea</i>	rosy pussy-toes	x	x	x	x	x	x	x		x
<i>Arnica lanceolata</i> ssp. <i>prima</i>	clasping arnica	x						x		
<i>Arnica latifolia</i>	broadleaf arnica							x		
<i>Arnica mollis</i>	hairy arnica	x		x				x		
<i>Artemisia ludoviciana</i>	silver wormwood	x			x			x		
<i>Artemisia spiciformis</i>	snowfield sagebrush		x	x	x		x	x		x
<i>Artemisia tridentata</i>	big sagebrush	x			x	x	x		x	x
<i>Cirsium andersonii</i>	Anderson's thistle					x				
<i>Cirsium scariosum</i>	meadow thistle	x	x	x		x	x	x		x
<i>Dieteria canescens</i>	hoary-aster	x			x					
<i>Ericameria discoidea</i>	whitestem goldenbush	x	x							
<i>Ericameria nauseosa</i>	rubber rabbitbrush				x			x	x	
<i>Erigeron algidus</i>	Sierra fleabane	x	x		x					
<i>Erigeron compositus</i>	cut-leaf fleabane		x							
<i>Erigeron coulteri</i>	Coulter's fleabane					x				
<i>Hulsea algida</i>	Pacific alpinegold		x						x	
<i>Oreostemma alpigenum</i> var. <i>andersonii</i>	Anderson's mountaingold	x		x		x	x			x
<i>Packera pauciflora</i>	alpine groundsel	x		x			x			
<i>Packera subnuda</i> var. <i>subnuda</i>	cleftleaf groundsel	x								x
<i>Pyrrocoma apargioides</i>	alpine flames	x	x							
<i>Raillardella argentea</i>	silky raillardella	x		x		x				

Species ^a	Common Name	SD	RD	TD	PP	SM	JC	EC	EO	TC
<i>Raillardella scaposa</i>	scaped raillardella	x								
<i>Senecio integerrimus</i> var. <i>exaltatus</i>	Columbia ragwort					x	x	x		
<i>Senecio scorzonella</i>	Sierra ragwort	x				x				
<i>Senecio triangularis</i>	arrowleaf ragwort	x					x			
<i>Solidago multiradiata</i>	northern goldenrod	x	x	x	x		x	x		
<i>Sphaeromeria cana</i>	gray chickensage		x							
<i>Stephanomeria tenuifolia</i>	narrow-leaved wire-lettuce				x					
<i>Symphyotrichum spathulatum</i>	western mountain aster	x								
<i>Taraxacum officinale</i> ^b	common dandelion		x	x	x	x	x	x		x
<i>Tragopogon</i> sp. ^b	salsify							x		
<i>Wyethia mollis</i>	soft mule's ears					x				
BORAGINACEAE – BORAGE FAMILY										
<i>Cryptantha</i> sp.	cryptantha				x					
<i>Hackelia micrantha</i>	meadow stickseed	x				x				
<i>Oreocarya nubigena</i>	Sierra oreocarya		x			x				
<i>Phacelia hastata</i> var. <i>compacta</i>	compact spear phacelia	x	x	x			x	x	x	x
BRASSICACEAE – MUSTARD FAMILY										
<i>Barbarea orthoceras</i>	straight-horned winter cress		x							
<i>Boechera elkoensis</i>	Elko rockcress		x							
<i>Boechera depauperata</i>	soldier rockcress		x							
<i>Boechera howellii</i>	Howell's rockcress	x			x					x
<i>Boechera lyallii</i>	Lyall's rockcress	x			x					
<i>Boechera pauciflora</i>	hairy stem rockcress		x		x					
<i>Boechera platysperma</i>	pioneer rockcress	x				x				
<i>Boechera retrofracta</i>	reflexed rockcress				x				x	

Species ^a	Common Name	SD	RD	TD	PP	SM	JC	EC	EO	TC
<i>Boechera stricta</i>	Drummond's rockcress	x								
<i>Cardamine breweri</i>	Brewer's bitter-cress				x					
<i>Descurainia californica</i>	California tansy mustard		x		x			x		
<i>Draba albertina</i>	Alberta draba	x		x		x	x			
<i>Erysimum perenne</i>	perennial wallflower	x		x	x	x	x	x		x
<i>Lepidium virginicum</i>	Virginia peppergrass	x	x		x			x	x	
<i>Rorippa curvipes</i>	curved-footed yellow cress	x								
<i>Sisymbrium altissimum</i> ^b	tumble mustard				x					
<i>Streptanthus tortuosus</i>	mountain jewelflower	x				x	x	x	x	
<i>Subularia aquatica</i> ssp. <i>americana</i> (CRPR 4.3)	water awlwort		x							
CAPRIFOLIACEAE – HONEYSUCKLE FAMILY										
<i>Symphoricarpos rotundifolius</i>	round-leaved snowberry			x	x			x		
CARYOPHYLLACEAE – PINK FAMILY										
<i>Eremogone kingii</i> var. <i>glabrescens</i>	King's sandwort	x	x			x				
<i>Sagina saginoides</i>	Arctic pearlwort	x								
<i>Silene</i> sp.	campion	x	x	x	x					
<i>Spergularia rubra</i>	red sand-spurrey	x							x	
<i>Stellaria longipes</i> ssp. <i>longipes</i>	Goldie's starwort			x						
CHENOPODIACEAE – GOOSEFOOT FAMILY										
<i>Chenopodium atrovirens</i>	dark green pigweed		x		x					
<i>Dysphania ambrosioides</i>	Mexican tea				x					
CORNACEAE – DOGWOOD FAMILY										
<i>Cornus sericea</i>	American dogwood		x		x					
CRASSULACEAE – STONECROP FAMILY										
<i>Rhodiola integrifolia</i> ssp. <i>integrifolia</i>	western roseroot	x	x			x				

Species ^a	Common Name	SD	RD	TD	PP	SM	JC	EC	EO	TC
<i>Sedum lanceolatum</i>	spearleaf stonecrop	x	x			x	x			
<i>Sedum spathulifolium</i>	broadleaf stonecrop					x	x			
ERICACEAE – HEATH FAMILY										
<i>Cassiope mertensiana</i>	white heather	x	x							
<i>Kalmia polifolia</i>	swamp laurel	x		x						
<i>Orthilia secunda</i>	one-sided wintergreen			x						
<i>Phyllodoce breweri</i>	Brewer's mountain heather	x	x	x		x	x	x		x
<i>Pyrola asarifolia</i> ssp. <i>asarifolia</i>	bog wintergreen	x		x		x				
<i>Rhododendron columbianum</i>	western Labrador tea		x							
<i>Vaccinium cespitosum</i>	dwarf bilberry	x		x		x	x			x
<i>Vaccinium uliginosum</i> ssp. <i>occidentale</i>	western blueberry	x		x						
EUPHORBIACEAE – SPURGE FAMILY										
<i>Euphorbia serpillifolia</i> ssp. <i>serpillifolia</i>	thyme-leaf sandmat				x					
FABACEAE – LEGUME FAMILY										
<i>Lupinus argenteus</i>	silvery lupine			x	x					
<i>Lupinus lepidus</i> var. <i>lobbii</i>	Lobb's dwarf lupine	x	x	x		x				x
<i>Lupinus polyphyllus</i>	meadow lupine						x			
<i>Trifolium monanthum</i> ssp. <i>monanthum</i>	carpet clover		x	x		x	x ^d			x
FAGACEAE – OAK FAMILY										
<i>Chrysoeipis sempervirens</i>	bush chinquapin				x					
GENTIANACEAE – GENTIAN FAMILY										
<i>Gentianopsis holopetala</i>	Sierra gentian	x		x						
GROSSULARIACEAE – GOOSEBERRY FAMILY										
<i>Ribes cereum</i>	wax current		x	x	x			x		x
<i>Ribes montigenum</i>	western prickly gooseberry	x	x			x		x		
HYPERICACEAE – ST. JOHN'S WORT FAMILY										
<i>Hypericum anagalloides</i>	tinker's penny	x		x			x	x		x

Species ^a	Common Name	SD	RD	TD	PP	SM	JC	EC	EO	TC
LAMIACEAE – MINT FAMILY										
<i>Monardella odoratissima</i> ssp. <i>pallida</i>	pale coyote-mint	x	x	x		x	x	x	x	x
<i>Stachys rigida</i> var. <i>rigida</i>	rigid hedge-nettle				x					
MONTIACEAE – MINER'S LETTUCE FAMILY										
<i>Calyptridium monospermum</i>	oneseed pussypaws	x	x	x		x	x	x		x
<i>Calyptridium umbellatum</i>	umbel-bearing pussypaws	x				x				
<i>Lewisia nevadensis</i>	Nevada lewisia	x		x		x	x			x
<i>Lewisia tripylla</i>	thread-leaved lewisia					x				
<i>Montia chamissoi</i>	toad lily					x				
ONAGRACEAE – EVENING PRIMROSE FAMILY										
<i>Chamerion angustifolium</i> ssp. <i>circumvagum</i>	fireweed	x	x	x	x	x	x	x		x
<i>Epilobium ciliatum</i> ssp. <i>ciliatum</i>	fringed willowherb					x		x		x
<i>Epilobium ciliatum</i> ssp. <i>glandulosum</i>	glandular fringed willowherb	x	x	x			x			x
<i>Epilobium hallianum</i>	glandular willowherb	x				x				
<i>Epilobium minutum</i>	chaparral willowherb		x							
<i>Epilobium obcordatum</i>	rockfringe	x								
<i>Gayophytum diffusum</i>	spreading groundsmoke	x			x	x		x		
<i>Gayophytum</i> sp.	groundsmoke		x			x				x
OPHIOGLOSSACEAE – ADDER'S-TONGUE FAMILY										
<i>Botrychium simplex</i>	least moonwort	x								
OROBANCHACEAE – BROOM-RAPE FAMILY										
<i>Castilleja applegatei</i> ssp. <i>pallida</i>	pale Applegate's paintbrush	x			x	x				x
<i>Castilleja miniata</i> ssp. <i>miniata</i>	giant red paintbrush				x					
<i>Castilleja nana</i>	alpine paintbrush	x				x				x
<i>Pedicularis attollens</i>	little elephant's head	x	x							

Species ^a	Common Name	SD	RD	TD	PP	SM	JC	EC	EO	TC
<i>Pedicularis groenlandica</i>	elephant's head	x		x						x
PAPAVERACEAE – POPPY FAMILY										
<i>Dicentra uniflora</i>	steer's head	x								
PARNASSIACEAE – GRASS-OF-PARNASSUS FAMILY										
<i>Parnassia palustris</i>	marsh grass-of-Parnassus	x		x			x			
PHYRMACEAE – LOPSEED FAMILY										
<i>Erythranthe breweri</i>	Brewer's monkeyflower				x					
<i>Erythranthe floribunda</i>	many-flowered monkeyflower	x								
<i>Erythranthe lewisii</i>	Lewis's monkeyflower				x					
<i>Erythranthe primuloides</i>	primrose monkeyflower	x		x		x	x			x
<i>Erythranthe suksdorfii</i>	Sukdort's monkeyflower	x								
<i>Erythranthe tilingii</i>	Tiling's monkeyflower	x	x		x	x				x
PLANTAGINACEAE – PLANTAIN FAMILY										
<i>Penstemon davidsonii</i> var. <i>davidsonii</i>	Davidson's beardtongue	x	x							
<i>Penstemon heterodoxus</i> var. <i>heterodoxus</i>	Sierra beardtongue	x	x	x		x	x	x		x
<i>Penstemon newberryi</i>	Newberry's beardtongue	x		x	x	x	x	x		x
<i>Penstemon rostriflorus</i>	beak-flower beardtongue				x			x		
<i>Penstemon rydbergii</i> var. <i>oreocharis</i>	Rydberg's beautiful mountain beardtongue						x	x		x
<i>Veronica serpyllifolia</i> ssp. <i>humifusa</i>	sprawling thyme-leaved speedwell	x			x			x		
<i>Veronica wormskjoldii</i>	American alpine speedwell			x			x			x
POLEMONIACEAE – PHLOX FAMILY										
<i>Ipomopsis aggregata</i> ssp. <i>aggregata</i>	clustered scarlet gilia				x					
<i>Linanthus pungens</i>	granite gilia	x	x	x	x			x	x	x

Species ^a	Common Name	SD	RD	TD	PP	SM	JC	EC	EO	TC
POLYGONACEAE – BUCKWHEAT FAMILY										
<i>Bistorta bistortoides</i>	western bistort	x		x		x	x	x		x
<i>Eriogonum esmeraldense</i> var. <i>esmeraldense</i>	Esmeralda wild buckwheat		x							
<i>Eriogonum incanum</i>	frosted wild buckwheat	x	x	x	x	x	x	x		x
<i>Eriogonum nudum</i> var. <i>deductum</i>	reduced wild buckwheat	x			x	x	x	x	x	x
<i>Eriogonum ovalifolium</i>	cushion wild buckwheat	x	x	x						
<i>Eriogonum umbellatum</i>	sulphur flower				x					
<i>Polygonum aviculare</i>	knotweed		x		x					
<i>Polygonum douglasii</i>	Douglas' knotweed					x				
<i>Polygonum polygaloides</i> ssp. <i>kelloggii</i>	Kellogg's knotweed	x								x
<i>Rumex paucifolius</i>	alpine sheep sorrel	x	x	x		x	x	x		x
<i>Rumex salicifolius</i>	willow dock		x		x			x		
<i>Rumex triangulivalvus</i>	triangular-valved dock		x					x	x	x
PRIMULACEAE – PRIMROSE FAMILY										
<i>Primula</i> cf. <i>tetrandra</i>	alpine shooting star			x		x	x			x
RANUNCULACEAE – BUTTERCUP FAMILY										
<i>Aquilegia formosa</i>	handsome columbine	x	x	x			x			
<i>Aquilegia pubescens</i>	downy columbine		x		x					
<i>Ranunculus alismifolius</i> var. <i>alismellus</i>	alisma-leaved buttercup	x		x		x	x			x
<i>Thalictrum fendleri</i>	Fendler's meadow-rue	x	x	x	x	x	x	x		
RHAMNACEAE – BUCKTHORN FAMILY										
<i>Ceanothus cordulatus</i>	mountain whitethorn				x					
ROSACEAE – ROSE FAMILY										
<i>Cercocarpus ledifolius</i>	curl-leaf mountain-mahogany				x					
<i>Dasiphora fruticosa</i>	shrubby cinquefoil	x	x							

Species ^a	Common Name	SD	RD	TD	PP	SM	JC	EC	EO	TC
<i>Drymocallis glandulosa</i>	glandular drymocallis							x		
<i>Drymocallis hansenii</i>	Yosemite woodbeauty			x		x				
<i>Drymocallis lactea</i> var. <i>lactea</i>	Sierran woodbeauty	x		x			x	x		x
<i>Fragaria virginiana</i>	mountain strawberry						x	x		
<i>Geum macrophyllum</i>	large-leaved avens	x				x	x	x		x
<i>Holodiscus discolor</i>	oceanspray			x	x	x		x		
<i>Horkelia fusca</i>	pinewoods horkelia	x		x		x	x			x
<i>Potentilla breweri</i>	Brewer's cinquefoil	x								x
<i>Potentilla gracilis</i> var. <i>fastigiata</i>	Nuttall's cinquefoil	x	x							
<i>Prunus emarginata</i>	bitter cherry				x					
<i>Purshia tridentata</i>	bitterbrush		x		x	x				
<i>Rosa woodsia</i>	Wood's rose		x		x					
<i>Sibbaldia procumbens</i>	creeping sibbaldia	x	x	x		x	x	x		x
<i>Spiraea splendens</i>	splendid spiraea	x				x	x			x
RUBIACEAE – COFFEE FAMILY										
<i>Galium bifolium</i>	Low Mountain bedstraw					x		x		
<i>Kelloggia galioides</i>	galium-like kelloggia				x					
SAPINDACEAE – SOAPBERRY FAMILY										
<i>Acer glabrum</i>	mountain maple				x					
SALICACEAE – WILLOW FAMILY										
<i>Populus tremuloides</i>	quaking aspen				x					
<i>Populus trichocarpa</i>	black cottonwood				x					
<i>Salix boothii</i>	Booth's willow					x				
<i>Salix eastwoodiae</i>	Sierra willow			x		x		x		x
<i>Salix jepsonii</i>	Jepson's willow	x	x							
<i>Salix melanopsis</i>	dusky willow									x
<i>Salix orestera</i>	gray-leafed Sierra willow	x	x	x	x	x	x	x	x	x

Species ^a	Common Name	SD	RD	TD	PP	SM	JC	EC	EO	TC
<i>Salix planifolia</i>	tea-leaved willow							x		
SAXIFRAGACEAE – SAXIFRAGE FAMILY										
<i>Heuchera rubescens</i>	pink alumroot				x					
<i>Micranthes aprica</i>	sun-loving saxifrage	x		x		x	x			x
<i>Pectiantia breweri</i>	Brewer's pectiantia				x			x		x
SCROPHULARIACEAE – FIGWORT FAMILY										
<i>Verbascum</i> sp. ^b	mullein				x					
VALERIANACEAE – VALERIAN FAMILY										
<i>Valeriana californica</i>	California valerian	x				x				
VIBURNACEAE – MUSKROOT FAMILY										
<i>Sambucus racemosa</i>	red elderberry			x						
VIOLACEAE – VIOLET FAMILY										
<i>Viola macloskeyi</i>	MacLoskey's violet			x				x		x
<i>Viola purpurea</i>	mountain violet	x								
<i>Viola</i> sp. ^c	violet			x						
MONOCOTS – GRASSES AND ALLIES										
ALLIACEAE – ONION FAMILY										
<i>Allium obtusum</i>	blunt onion					x				
<i>Allium validum</i>	Pacific onion	x	x	x		x	x	x		x
CYPERACEAE – SEDGE FAMILY										
<i>Carex abrupta</i>	abrupt-beaked sedge	x				x			x	x
<i>Carex amplifolia</i>	big-leaf sedge			x						x
<i>Carex aquatilis</i> var. <i>aquatilis</i>	water sedge			x						
<i>Carex congdonii</i> (CRPR 4.3)	Congdon's sedge							x		
<i>Carex douglasii</i>	Douglas' sedge		x	x	x					
<i>Carex filifolia</i> var. <i>erostrata</i>	sagebrush sedge	x	x	x		x	x	x		x
<i>Carex fissuricola</i>	cleft sedge					x				
<i>Carex heteroneura</i>	smooth-fruited sedge		x							
<i>Carex infirmivervia</i>	weakly veined sedge	x								
<i>Carex lenticularis</i> var. <i>lipocarpa</i>	lakeshore sedge				x					x

Species ^a	Common Name	SD	RD	TD	PP	SM	JC	EC	EO	TC
<i>Carex multicosata</i>	many-ribbed sedge	x								x
<i>Carex raynoldsii</i>	Raynold's sedge					x			x	
<i>Carex simulata</i>	short-beaked sedge				x					
<i>Carex spectabilis</i>	showy sedge	x				x		x	x	
<i>Carex utriculata</i>	southern beaked sedge							x		
IRIDACEAE – IRIS FAMILY										
<i>Iris missouriensis</i>	western blue flag		x			x				
JUNCACEAE – RUSH FAMILY										
<i>Juncus balticus</i> ssp. <i>ater</i>	Baltic rush	x	x	x		x	x	x	x	x
<i>Juncus mertensianus</i>	Merten's rush					x				
<i>Juncus parryi</i>	Parry's rush	x	x		x	x	x	x	x	x
<i>Juncus xiphioides</i>	iris-leaved rush			x						
<i>Luzula comosa</i> var. <i>laxa</i>	flattened tufted hairy wood rush	x					x			
<i>Luzula orestera</i>	mountain-dwelling hairy wood rush	x		x						
<i>Luzula parviflora</i>	small-flowered wood rush		x	x						x
LILIACEAE – LILY FAMILY										
<i>Calochortus leichtlinii</i>	Leichtlin's mariposa lily	x			x	x				
<i>Fritillaria</i> sp.	fritillary					x				
<i>Maianthemum stellatum</i>	little false Solomon's-seal				x					
MELANTHIACEAE – CAMAS FAMILY										
<i>Veratrum californicum</i> var. <i>californicum</i>	Californian false hellebore						x	x		
ORCHIDACEAE – ORCHID FAMILY										
<i>Platanthera dilatata</i> var. <i>leucostachys</i>	white-flowered bog-orchid	x								
POACEAE – GRASS FAMILY										
<i>Agrostis humilis</i> (CRPR 2B.3)	mountain bent grass	x								
<i>Agrostis idahoensis</i>	Idaho redtop	x							x	

Species ^a	Common Name	SD	RD	TD	PP	SM	JC	EC	EO	TC
<i>Agrostis scabra</i>	rough bent grass	x			x					
<i>Agrostis variabilis</i>	mountain bent grass	x								
<i>Briza minor</i>	small quaking grass				x					
<i>Bromus sitchensis</i> var. <i>carinatus</i>	California brome				x	x	x	x		
<i>Bromus tectorum</i> ^b	cheat grass				x			x		
<i>Calamagrostis canadensis</i>	bluejoint reed grass	x			x					
<i>Danthonia intermedia</i> ssp. <i>intermedia</i>	intermediate oat grass	x	x	x						x
<i>Danthonia unispicata</i>	one-spike oat grass	x								
<i>Deschampsia cespitosa</i> ssp. <i>cespitosa</i>	tufted hairgrass	x		x		x				
<i>Deschampsia elongata</i>	slender hair grass							x		x
<i>Elymus elymoides</i> var. <i>elymoides</i>	common squirreltail	x	x	x	x	x	x	x	x	x
<i>Elymus trachycaulus</i> ssp. <i>trachycaulus</i>	slender wheat grass		x	x	x	x		x		
<i>Hordeum brachyantherum</i>	northern barley		x		x	x	x	x		x
<i>Muhlenbergia filiformis</i>	pull-up muhly	x	x	x			x			
<i>Phleum alpinum</i>	alpine timothy	x	x	x		x	x	x		x
<i>Phleum pratense</i> ^b	cultivated timothy		x							
<i>Poa pratensis</i> ssp. <i>pratensis</i> ^b	Kentucky blue grass		x			x	x	x	x	x
<i>Poa secunda</i> ssp. <i>secunda</i>	one-sided blue grass				x					
<i>Poa wheeleri</i>	Wheeler's blue grass	x	x	x	x	x	x	x		x
<i>Sporobolus cryptandrus</i>	sand dropseed				x					
<i>Stipa kingii</i>	King's rice grass	x		x		x	x			x
<i>Stipa hymenoides</i>	sand rice grass				x					
<i>Stipa nelsonii</i> var. <i>dorei</i>	mountain needle grass					x				
<i>Stipa occidentalis</i>	western needle grass				x	x		x		
<i>Trisetum spicatum</i>	spike false oat	x	x		x		x			x

Species ^a	Common Name	SD	RD	TD	PP	SM	JC	EC	EO	TC
THEMIDACEAE – BRODIAEA FAMILY										
<i>Triteleia montana</i>	mountain triteleia					x				

SD = Saddlebag Dam and Campgrounds; RD = Rhinedollar Dam and Penstock Trail; TD = Tioga Dam; PP = Poole Powerhouse; SM = Sawmill Campground; JC = Junction Campground; EC = Ellery Lake Campground; EO = Ellery Lake Overlook; TC = Tioga Lake Campground; x = species observed; CRPR = California Rare Plant Rank

^a Special-status species are shown in bold; their status is listed after their scientific name.

^b Non-native species.

^c Characteristics present for an identification to species were not present during the survey; however, vegetative characteristics determined that the species was not special status (i.e., golden violet [*Viola purpurea* ssp. *aurea*]).

^d Species was vegetative; identification not confirmed.

ATTACHMENT 3

Resource Management Plan

SOUTHERN CALIFORNIA EDISON

LEE VINING HYDROELECTRIC PROJECT

(FERC PROJECT No. 1388)



RESOURCE MANAGEMENT PLAN



January 2025

SOUTHERN CALIFORNIA EDISON

LEE VINING HYDROELECTRIC PROJECT (FERC PROJECT No. 1388)

RESOURCE MANAGEMENT PLAN

Southern California Edison
2244 Walnut Grove Avenue
Rosemead, CA 91770

January 2025

Support from:

Kleinschmidt

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LIST OF ACRONYMS AND ABBREVIATIONS

APP	Avian Protection Plan
BMP	best management practice
CDFW	California Department of Fish and Wildlife
DLA	Draft License Application
ESAP	Endangered Species Alert Program
FERC	Federal Energy Regulatory Commission
FLA	Final License Application
HFDT	High Fire District Threat
O&M	operations and maintenance
PME	protection, mitigation, and enhancement
Project	Lee Vining Hydroelectric Project (FERC Project No. 1388)
RMP	Resources Management Plan
SCE	Southern California Edison [Company]
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
WMP	Wildfire Mitigation Plan

1.0 INTRODUCTION

Southern California Edison [Company] (SCE) has prepared this Resources Management Plan (RMP) to accompany SCE's application for a new Federal Energy Regulatory Commission (FERC) license for the Lee Vining Hydroelectric Project (Project; FERC Project No. 1388).

Combining resource areas under one RMP will enable SCE to more comprehensively train staff and successfully implement protection, mitigation, and enhancement (PME) measures. This plan also describes routine operations and maintenance (O&M) activities that occur within the FERC Project Boundary.

The RMP will guide SCE management and stewardship activities as outlined in this document. Specifically, the following activities are governed by this RMP:

- Routine O&M activities
- Implementation of SCE company-wide management and protection plans
- Monitoring of invasive plants
- Aesthetic resources

Additionally, a Historic Properties Management Plan is being prepared as part of the relicensing for the Project and will be filed with FERC later in 2025. The Historic Properties Management Plan is a standalone document and includes measures to avoid, protect, mitigate, or enhance cultural and Tribal resources; it is not discussed in this RMP, as portions of it contain confidential information.

2.0 PROJECT OPERATIONS

SCE provides the following high-level overview of Project operations for background and informational purposes only. A more detailed description of Project facilities operations is included in Exhibits A and B, filed in Volume I of the Final License Application (FLA). The Project consists of three dams and reservoirs, an auxiliary dam, a flowline consisting of a pipeline and penstock, and a powerhouse.

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 Reservoirs are manually operated and adjusted for minimum flow requirements and water 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.

The Project is operated in compliance with existing regulatory requirements, agreements, and water rights to generate power. Sections 2.1, *Water Management*, and

2.2, *Inspections and Maintenance*, describe how the Project manages water in compliance with its FERC license and water delivery agreements to support its operations, and how inspections and maintenance of Project facilities are carried out. Project operations are described in further detail in Exhibit B of the FLA.

2.1. WATER MANAGEMENT

Releases and spills from both Saddlebag and Tioga Lakes flow into Ellery Lake, which is the intake and regulating reservoir for Poole Powerhouse. 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 flowline and penstock.

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. . Once water has left the FERC Project Boundary, SCE has no control over downstream diversions.

SCE 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 fewer than 8 hours.

As described in FLA Exhibit A, seven stream gages within the FERC Project Boundary actively record flows released from the Project dams; these gages are published by U.S. Geological Survey but are owned by SCE. Flows leaving the Poole Powerhouse are measured by acoustic velocity meter installed within the 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 mutual agreement with the U.S. Forest Service (USFS).

2.2. ROUTINE INSPECTIONS AND MAINTENANCE

Routine inspections and maintenance activities are conducted at Project facilities to verify the structural and/or functional integrity of the facilities, identify conditions that might disrupt operations or threaten public safety, and maintain the facilities in safe and operational conditions (Table 2.2-1). These activities are generally described in FLA Exhibit E, Section 4.4, *Project Maintenance*, and further described in the below sections.

Routine inspections are conducted by an operator 4 to 5 days per week. Monthly spill prevention, control, and countermeasure inspections, as well as switchyard inspections, also occur. During spring and summer peak run-off conditions, inspections occur daily; weekly and monthly inspections occur outside of peak run-off, while hydrographers

perform weekly inspections of Saddlebag Dam in summer months. Monthly inspections occur at all dams year-round; however, there is limited visibility in winter months.

Routine O&M activities include minor road and trail maintenance; transmission, power, and communication line maintenance; maintenance outages; powerhouse inspections and maintenance; and flowline inspections and maintenance. Maintenance work is conducted as needed throughout the year. Trash rack grids are raked to ensure they are clean and free of debris. Minor concrete repairs and spalling is fixed as needed. Other normal maintenance includes snow removal and emergency repairs to the generator and associated equipment as needed.

Table 2.2-1. Routine Project Inspection and Maintenance Activities

Maintenance Activity	Relevant Area	Frequency	Description
Maintenance of dirt/native roads and parking areas, including ditch and culvert maintenance	• All native Project roads and parking areas (e.g., Poole Power Plant Road) • Parking areas at boater put-in/take-outs	Annually and as needed	Minor Project road maintenance: • Grading within the road prism • Removing debris and basic repairs, including filling of pothole • Maintaining erosion control features such as drains, ditches, and water bars • Repairing, replacing, or installing access control structures such as posts, cables, and barrier rock • Cleaning and clearing debris and sediment from culverts with a backhoe or hand shovel • Repairing and replacing signage • Conducting vegetation management concurrently with road maintenance on an as-needed basis Major Project road maintenance: • Placing or replacing culverts and other drainage features
Repaving/patching asphalt roads	• Paved Project roads and parking areas (e.g., pavement around Poole Powerhouse) • Paved Project roads around powerhouse, machine shop, and warehouse buildings	As needed (approximately every 2–3 years)	Minor Project road maintenance: • Cleaning and clearing debris and sediment from culverts and ditches with a backhoe or hand shovel • Filling blacktop and potholes with hand tools Major Project road maintenance: • Using pick-up truck, dump truck, loaders, backhoes, and graders for resurfacing larger/longer parking areas or roads

Maintenance Activity	Relevant Area	Frequency	Description
Vegetation trimming and removal/clearing	All Project roads and facilities: powerhouse, dams, water conveyance system, penstock, buried pipe or flowlines, and stream gage sites	Every other year; as needed.	• Brush mowing along roadway to maintain road as necessary for safe line of sight and passage • Trimming both manually and with tools/equipment (i.e., weed whacker or chainsaw) • Removing or preventing tree growth whose roots could intrude on the pipelines and diminish their integrity • Trimming or mowing around access locations such as hatches or manholes to be free of vegetation out to 10 feet
Hazard tree inspection and removal	All Project roads and facilities: powerhouse, dams, water conveyance system, penstock, and stream gage sites	• Weekly and monthly inspections • Removal as needed	• Removing hazard brush and trees that are deemed a threat to road or vehicles traveling over them or near Project infrastructure • Removing both manually and with tools/equipment
Slide debris removal	All Project roads	As needed, typically following winter rains	• Removing slide debris with grader, loader, and dump truck • Spreading material on road near debris slide as road base
Structural inspection and maintenance	• Powerhouse • Saddlebag Dam • Tioga Dam • Tioga Auxiliary Dam • Rhinedollar Dam • Penstock • Water conveyance system	• Weekly and monthly inspections • Daily during spring/summer in peak run-off conditions • Maintenance work as needed	• Raking trash rack grids to ensure they are clean and free of debris • Spillway debris removal • Fixing minor concrete repairs/spalling • Handrail repairs
Material/slash burning	Varies depending upon source material location	Annually, or as needed	• Obtaining permit from Inyo National Forest when needed • Burning brush, slash, or other vegetation accumulated from various Project operations

Maintenance Activity	Relevant Area	Frequency	Description
Manage access gates and security fencing	- Vicinity of powerhouse, including machine shop and warehouse - Gates at Tioga, Saddlebag, and Rhinedollar Dams - Selected locations around access points at open flumes	Inspect weekly and monthly during other facility inspections	Repair as needed
Sediment management (physical removal) ^a	Intake areas	As needed	Removing sediment with hand shovels, if needed
Facility painting	- Powerhouse, handrails, maintenance buildings - Penstock - Parking lots	Annually maintain as needed (facilities on a rotation of every 10–20 years)	Following general aesthetic guidelines (e.g., painting in earth tones, landscaping with vegetation similar to surrounding areas)

^a Sediment removal/management with hand shovels is considered a standard operations and maintenance activity, though none has been conducted in the past 20 years of the Project.

2.2.1. FACILITIES REPAIR

SCE routinely makes repairs to structures and facilities and conducts maintenance to retain the functional and structural integrity of the Project facilities. Facilities include gaging stations and flumes, intakes and diversion structures, and flow meters. Within these facilities, maintenance and repairs may occur on gates, barricades, small structures (e.g., gaging stations and storage facilities), streambanks, and diversions. Major categories of facilities include the following:

- Measuring stations and flumes—SCE uses measuring stations and flumes to measure water in the waterways. Maintenance work related to gaging stations and flumes include mowing vegetation to provide access along channel banks and removing stream deposit within an area of measuring stations to allow for unobstructed water flow and the accurate reading of water flow in waterways.
- Intake and diversion structures—SCE uses intake and diversion structures to divert water from a stream or canal. Stream deposits (accumulated sediment and woody debris) are removed above and/or below intake structures, as needed.
- Gate inspection and maintenance—This may include the operation of intake drain gates, sand traps, and chamber drain gates. These routine operations do not result in the draining of any ponds, which minimize effects to the stream. SCE is required to inspect penstocks, which does involve lowering the ponds to expose the entry point to the penstock.

2.2.2. MAINTENANCE OUTAGE

SCE conducts annual maintenance outages at the Poole Powerhouse to support minor maintenance and repair any wear and tear, typically during low-flow periods (fall). The maintenance outage typically lasts for 1 to 3 weeks. During the outage, SCE conducts mechanical and electrical inspections and maintenance of powerhouse appurtenances. In conjunction with the maintenance outage, SCE also makes minor repairs (e.g., trash rack grid raking, spillway debris removal, concrete spalling/repairs, handrail repairs) to the dams, as appropriate.

SCE conducts physical inspections of the flowline/penstock every quarter.

2.2.3. DISTRIBUTION, POWER, AND COMMUNICATION LINE MAINTENANCE

The Project includes a switchyard immediately adjacent to the Poole Powerhouse. This short connection is maintained by Project personnel.

2.2.4. ROAD GRADING AND MAINTENANCE

Access roads to Project dams are inspected during normal Project activities. Repairs and maintenance are typically conducted in the spring, following the rainy winter season, and as needed throughout the summer and fall. Maintenance activities include filing potholes, grading the road prism, adding gravel to address instances of washout, mowing grass,

and light brushing. Vegetation management is discussed in Section 4.1, *Botanical and Wildlife Resources*.

3.0 NON-PROJECT CORPORATE-WIDE PLANS

The following are non-Project, SCE management plans that will continue to be implemented during the new license, in conjunction with the RMP. These existing plans are corporate-wide, non-Project plans that outline general internal processes and procedures, providing direction to SCE staff when working across all SCE-owned facilities. For these reasons, they are not considered part of the FERC license, but rather are described below to indicate, for informational purposes only, how these plans are implemented for this Project.

3.1. WILDFIRE MITIGATION PLAN

SCE has an existing and recently updated Wildfire Mitigation Plan (WMP) (SCE, 2022). The plan outlines methods to reduce the risk of wildfire that may be caused by utility actions or equipment and minimize consequences of wildfire by managing vegetation and other potential fuel sources. The WMP includes an actionable, measurable, and adaptive plan to reduce the risk of potential ignitions associated with SCE's electrical infrastructure in high fire risk areas by increasing system hardening, bolstering situational awareness, and enhancing operational practices. While this RMP is considered confidential because of the sensitive facility information, it is available for review by resource agencies at their request. The key provisions are listed below:

- Risk assessment and mapping
- Situational awareness
- Grid design and system hardening
- Asset management and inspections
- Vegetation management and inspections
- Grid operations and protocols
- Data governance
- Resource allocation methodology
- Emergency planning and preparedness
- Stakeholder cooperation and community engagement
- Agency consultation

SCE conducts additional vegetation inspections and maintenance in High Fire District Threats (HFDTs) as part of the WMP (SCE, 2022). Sites located in the HFDT are

inspected on an annual basis, and many sites have an expanded clearance; expanded clearances in HFDT for high voltage facilities have a 100-foot clearance, and low voltage sites have a 30-foot clearance to reduce wildfire ignition risks. To maintain the expanded clearances, vegetation maintenance is done annually on a regularly scheduled rotation.

SCE maintains rights-of-way to approximately 10 feet on either side of Project flowlines, penstocks, Project roads, and Project structures to prevent buildup of woody growth and dead debris that could contribute to wildfire risks.

3.2. AVIAN PROTECTION PLAN

SCE developed the Avian Protection Plan (APP) as company-wide guidance for the protection of avian species at SCE-owned facilities. The APP is implemented for the Project in accordance with primary federal laws protecting birds, the Bald and Golden Eagle Protection Act, the federal Endangered Species Act, and the Migratory Bird Treaty Act. Within the plan, there are established roles for various SCE personnel to follow state and federal laws as they relate to the protection of bird species within the FERC Project Boundary. The primary procedures discussed in this document include permitting, avian mortality notification and prevention, proactive retrofits, bird nest removal, injured bird discovery, and ground-disturbing activities. As this plan is adapted to meet the needs of each specific activity and is implemented in accordance with other best management practices (BMP) and appropriate consultation activities, a plan specific to the Project is not necessary.

3.3. NESTING BIRD GUIDANCE FOR SMALL PROJECTS

SCE's Nesting Bird Management Guidance for Small Projects was approved in April 2016 as a company-wide plan to provide guidance to staff when working at SCE-owned facilities. This plan is implemented as needed at the Project to prevent take of active nests, eggs, nestlings, or nesting birds as a result of construction activities. SCE defines management of nesting birds as "avoiding or minimizing project activities that have the potential to cause active nest failures as well as to minimize or avoid construction delays." For each activity, SCE's avian biologist define a buffer around existing nests at the Project site(s) based on guidelines provided in the guidance document. Pre-activity nesting bird surveys are conducted during the recognized nesting season and adjusted for altitude across the FERC Project Boundary. As this guidance document was developed to meet the needs of each specific activity and implemented in accordance with other BMPs and appropriate consultation activities across all SCE facilities statewide, a plan specific to the Project is not necessary.

3.4. VEGETATION MANAGEMENT PROGRAM GUIDES

SCE has two main corporate-wide documents that guide vegetation management at any SCE-owned sites: the *Vegetation Management Operations Manual* and the *SCE VM-3 Program Guide WMP: VM-3 Expanded Clearances for Legacy Facilities* (Vegetation Management Activity of the WMP). The *Vegetation Management Operations Manual* is guidance primarily for keeping trees clear of transmission lines. The *Vegetation*

Management Activity of the WMP outlines other procedures for keeping hydropower facilities clear of vegetation and reducing the risk of wildfire.

Along buried pipelines, SCE is focused on removing or preventing tree growth whose roots could intrude on the pipelines and diminish their integrity. Routine maintenance around access locations such as hatches or manholes is also cleared free of vegetation out to 10 feet. SCE monitors vegetation growth on a yearly basis and treats as needed. However, conveyance systems/pipelines are scheduled for routine clearing on a 3-year rotation, with a decadal cycle for larger tree and wood-debris removal.

As the vegetation management program is adapted to meet the needs of each specific activity and implemented in accordance with other BMPs and appropriate consultation activities across all SCE facilities statewide, a plan specific to the Project is not necessary.

3.5. ENDANGERED SPECIES ALERT PROGRAM

The Endangered Species Alert Program (ESAP) (SCE, 2005) was developed to provide SCE personnel with a means to identify when they may be working within an area with the potential occurrence of legally protected plant and animal species in the SCE service territory. For each of these species within the SCE service territory, the ESAP Manual includes a photograph, description, natural history information, and map showing the species' distribution in relation to SCE facilities. Should a proposed activity have potential to adversely affect a known special-status species population, SCE's Environmental Department staff will be notified to evaluate the situation and, if needed, participate in consultation with the relevant regulatory agencies.

3.6. INVASIVE MUSSEL PREVENTION PLAN

SCE implemented the Invasive Mussel Prevention Plan in July 2017, which outlines the prevention of introduction and spread of invasive quagga mussel (*Dreissena rostriformis bugensis*) and zebra mussel (*Dreissena polymorpha*) into Project lakes. Quagga and zebra mussels have rapidly spread throughout the United States; once established, these mussels have the potential to result in physical damage to intake pipes and similar hard surfaces that would comprise the Project's infrastructure. Establishment of mussel species is most often the direct result of transportation via boats or vessels. Most Project lakes are open to the public for recreation, so transportation of these species is possible. Lakes operated by SCE are hydrologically connected and susceptible to sequential infestation.

SCE assessed each lake for their vulnerability to be invaded in 2009–2010. Results from this study indicate that all Project lakes are low risk for establishment and introduction. Even with this low risk, SCE continues to provide public education and outreach through signs, kiosks, and brochures, explaining the economic damage that invasive mussel species can cause and how to prevent their spread.

As this invasive mussel prevention plan is adapted to meet the needs of each specific activity and implemented in accordance with other BMPs and appropriate consultation activities across all SCE facilities statewide, a plan specific to the Project is not necessary.

3.7. HAZARDOUS SUBSTANCES PLAN

The Project follows the Plan for Oil and Hazardous Waste Storage and Spill Prevention and Cleanup. The plan requires SCE to (1) maintain a cache of spill cleanup equipment suitable in the FERC Project Boundary for any spill from a project; (2) periodically inform the 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 Aarea; and (3) inform the 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 FERC Project Boundary, storage procedures, spill prevention measures, and cleanup measures.

4.0 PROJECT-SPECIFIC MANAGEMENT PLANS AND MEASURES

The following are SCE's proposed Project-specific plans or measures, developed as part of the Project relicensing, which will be implemented, when appropriate, as part of routine O&M activities at the Project described in Section 2.2. Where appropriate, individual plans are included as attachments to this RMP.

4.1. EROSION CONTROL PLAN (APPENDIX E.1, ATTACHMENT 2)

In general, the Project does not have a significant effect on erosion within Lee Vining Creek. SCE has updated the Project's 1997 *Plan for Control of Erosion, Stream Sedimentation, Soil Mass Movement, and Dust* (SCE, 1997). The plan was developed to provide general measures to control erosion, stream sedimentation, soil mass movement, and dust occurring as the result of routine O&M of the facilities.

4.2. BOTANICAL AND WILDLIFE RESOURCES

Routine Project O&M includes numerous activities to ensure the safe operations of the Project. Botanical and wildlife resource surveys were conducted as part of the relicensing; based on the data collected during relicensing surveys, no adverse effects to botanical or wildlife resources, including special-status species, within the FERC Project Boundary were identified as a result of routine O&M activities.

The below sections identify routine O&M activities associated with the Project that may pertain to botanical or wildlife resources. These activities typically occur within previously disturbed areas or in areas that are regularly maintained and cleared of vegetation surrounding the Project facilities.

4.2.1. MEASURES TO PROJECT BOTANICAL RESOURCES

The goals and objectives of this section include the following:

- Provide a clear operational decision-making process related to botanical resources when planning and/or implementing routine O&M activities.

- During routine O&M activities, prevent disturbance or effects to federally and state-listed rare, threatened, or endangered species; USFS species of conservation concern; species with a California Rare Plant Rank designation of 1 or 2; or other special-status plant species.
- During routine O&M activities, reduce spread of existing populations and introduction of non-native invasive species through the use of BMPs.
- Describe the methodology for cheat grass monitoring at Poole Powerhouse.

4.2.1.1. Special-Status Plants and Sensitive Natural Communities

GENERAL AVOIDANCE MEASURES

During routine O&M activities, where special-status species and sensitive natural communities exist, avoidance of those species will be employed wherever possible. Measures to facilitate avoidance may include, but are not restricted to, the following:

- Demarcation of the maximum extent of the special-status resource(s) to be avoided: This may include flagging of individual resources or installation of a temporary barrier (e.g., roping off areas to be avoided; installation of silt fencing, straw wattles, or gravel/sandbags if soil disturbance is anticipated) to prevent effects to the species.
- Retention of a biological monitor during ground-disturbing or vegetation removal activities so that special-status resources are avoided: SCE, its biologist, and appropriate agencies will jointly determine the need for monitoring. Any effects to federally or state-listed species will be reported to the USFS, U.S. Fish and Wildlife Service (USFWS), FERC (as appropriate), and California Department of Fish and Wildlife (CDFW) within 24 hours.

MITIGATION FOR UNAVOIDABLE EFFECTS

If effects of a routine O&M activity to special-status plant species or sensitive natural communities cannot be avoided, effects will be minimized to the extent possible. Mitigation for effects may be required depending on the status and size of the affected population.

Measures to mitigate for unavoidable effects may include, but are not restricted to, the following:

- Collection of plant material (e.g., seeds, corms, bulbs, whole plants) for distribution and revegetation after the activity is completed
- Translocation of special-status plants

Implementation of the appropriate mitigation measures will be managed by SCE's Environmental Manager. If deemed necessary, a plan will be developed and submitted to the USFS and/or CDFW (as appropriate) for review and approval prior to implementation.

4.2.1.2. Invasive Plants

Implementation of BMPs that reduce invasive plant introduction and spread can help reduce future maintenance needs and costs; reduce fire hazards; reduce herbicide use; enhance access and safety; limit liability for the governing agency or lessee, maintain good public relations; and protect existing wildlife habitat, native plant populations, beneficial insects, as well as threatened and endangered species (Cal-IPC, 2012).

Every 3 years following license issuance, SCE intends to monitor the three existing populations of cheat grass (*Bromus tectorum*) at Poole Powerhouse (PME-4, *Invasive Species Monitoring*) with the goal of containment, in line with USFS recommendations. Populations will be counted, measured, and mapped for comparison from one survey year to the next. In the event that SCE intends to conduct ground-disturbing activities near any of the cheat grass populations as part of any routine O&M activity, SCE will develop a plan to prevent or reduce the opportunity for spread in consultation with the USFS.

For non-routine O&M activities that could introduce a new species or cause an existing species to propagate, SCE will consult with the Inyo National Forest to determine the appropriate measures to be implemented with respect to control of invasive plants.

BEST MANAGEMENT PRACTICES

Appropriate BMPs will be dependent on the type of work activity; location of the work (e.g., existing disturbed area, naturally vegetated area); timing of the work; invasive plant species identified; and treatment method required. The following general BMPs are recommended to avoid/minimize the spread of invasive plant species when conducting routine O&M activities:

- Where feasible, do not stage equipment, materials, or crews in invasive plant-infested areas.
- Where feasible, invasive plant infestations will be designated as control areas (i.e., areas where equipment, traffic, and soil-disturbing activities will be excluded). If control areas are designated, they will be identified on Project maps and delineated in the field with flagging.
- All equipment and vehicles used for ground disturbing projects will be free of invasive plant material before entering the FERC Project Boundary. Equipment will be considered clean when visual inspection does not reveal soil, seeds, plant material, or other such debris. Cleaning will occur at a vehicle washing station or steam cleaning facility before the equipment and vehicles enter the FERC Project Boundary.
- When working in areas of known invasive plant infestations within the FERC Project Boundary, equipment will be cleaned before moving to other work sites to prevent the spread of invasive plant species from an infested to potentially non-infested area. Prior to accessing sites free of non-native invasive plants, SCE personnel will clean footwear of soil and seeds and disinfect soles with bleach. In instances where SCE

staff have been working in an area with infestation and the intent is to move to an area that is infestation free, SCE staff are trained annually to clean the equipment before use in the new area (FERC-required annual training). Depending on the circumstances, the equipment is either moved via trailer to an off-site location and cleaned, or is cleaned on-site (before moving), as appropriate. Infested areas will be identified on Project maps.

- If erosion control measures are used (e.g., hay bales, straw wattles), they will be certified weed-free. If certified weed-free materials are not available, weed-free rice straw or non-vegetated material (e.g., sand or gravel bags) will be substituted.

4.2.2. TRIMMING AND MOWING ALONG ROADS, ALONG TRAILS, AND AROUND PROJECT FACILITIES

As part of routine O&M at the Project, vegetation trimming and removal/clearing is performed as needed at all Project facilities, including Poole Powerhouse, dams, penstock, and stream gages for safety purposes and to prevent overgrowth of vegetation that interferes with the flow of water and the measurement of flow through the gaging stations. SCE staff brush mow using a flail-type mower along roadways to maintain roads as necessary for safe line of sight and passage, as well as wildfire mitigation. Trimming is performed both manually and with tools/equipment (i.e., string trimmer or chainsaw). Herbicides are only used in the Inyo National Forest with USFS approval under specific conditions, and consistent with the *Forest-wide Invasive Plants Treatment Project Environmental Assessment* (USFS, 2019).

4.2.3. HAZARD TREE REMOVAL¹

Hazard tree inspection and removal are performed as needed at Project facilities as part of routine O&M activities. SCE staff remove hazard brush and trees deemed a threat to road or vehicles traveling them, or near Project infrastructure. Removal occurs as needed and is performed both manually and with tools/equipment.

In 2022, to support wildfire prevention, an effort began to convert the habitat type around Poole Powerhouse from conifer-dominated to deciduous and shrub habitat (e.g., aspen, willow, and maple). Large conifers pose a greater fire hazard and potential risks of falling in winter risk than shrubs and deciduous trees. SCE removed all large conifers (approximately 200 trees) from the area in 2022 with approval from the USFS and CDFW. SCE continues to remove conifer saplings as they are identified, on an as-needed basis, in the vicinity of Poole Powerhouse to manage the habitat.

¹ Hazard trees include dead, decadent or rotten trees, forked trees, trees weakened by decay or disease, trees susceptible to wind-throw, and trees that are leaning toward the conductors or have large branches that may fall on the lines or facilities. Hazard trees will be felled and left as is, just as they would have been if nature had allowed them to fall. The maximum stump height of any tree felled will be 12 inches measured from the uphill side of the stump. No removal of wood is authorized for any SCE or contractor employee for personal use or gain.

4.2.4. MEASURES TO PROTECT WILDLIFE RESOURCES

The goals and objectives of this section include:

- Provide a clear operational decision-making process related to special-status wildlife resources when planning and/or implementing routine O&M activities.
- During routine O&M activities, prevent disturbance or adverse effect on special-status wildlife species including federally and state-listed endangered and threatened species, USFS At-Risk Species and Species of Conservation Concern, California Species of Special Concern, and nesting birds and raptors.

4.2.4.1. Special-Status Wildlife

PME measures for special-status wildlife during routine O&M activities are described below. These measures are intended to protect resources in the FERC Project Boundary and are not indicative of an identified Project effect.

GENERAL AVOIDANCE MEASURES

During routine O&M activities, effects to special-status species will be avoided wherever possible. During the annual planning process, the SCE Environmental Manager will review the planned routine O&M locations and determine if there is the potential for the occurrence of special-status wildlife. If the SCE Environmental Manager determines that any planned routine O&M location has the potential to support a special-status wildlife species, field surveys will be conducted as early as possible in the planning process to allow modifications to routine O&M activities, where feasible, to avoid or reduce a potential effect.

YOSEMITE TOAD

Yosemite toad (*Anaxyrus canorus*) is known to occur at three locations adjacent or in close proximity to the FERC Project Boundary: the southern end of Saddlebag Lake, in a few locations west of Lee Vining Creek below Slate Creek, and at the inlet to Tioga Lake. These locations have not been subject to routine maintenance in the past and are not anticipated to undergo routine maintenance in the future. SCE will avoid performing routine O&M or other ground -disturbing activities in these locations during the term of the new license. Should future O&M activities be needed in any of these areas, SCE will have qualified biologists survey the area for Yosemite toad activity and flag an avoidance area with an appropriately sized buffer to avoid take of Yosemite toad. Prior to conducting activities in known Yosemite toad locations, SCE will consult with the USFS and USFWS to seek their review and approval in advance of the activity.

BIGHORN SHEEP

Bighorn sheep (*Ovis canadensis*) freely roam throughout the vicinity of the FERC Project Boundary without interference from the Project. No special measures are needed to protect bighorn sheep with respect to routine O&M activities.

4.3. AESTHETIC RESOURCES

Buildings, other structures, and pipelines are designed, placed, landscaped, and painted in earth tones to blend into the surrounding area. The facility areas are landscaped with trees and scrubs to screen and break up the lines of the buildings.

Project-related routine O&M activities will consider building materials, color, conservation of vegetation, and landscaping to preserve the aesthetics of the FERC Project Boundary.

5.0 CONSULTATION AND PLAN REVIEW

5.1. PRE-LICENSE CONSULTATION

This RMP was developed during the relicensing process, prior to submittal of the FLA in January 2025, as indicated below.

- June 11, 2024: RMP outline provided to Technical Work Group
- July 16, 2024: Draft RMP distributed to Technical Working Group
- August 27, 2024: RMP filed as part of the Project Draft License Application (DLA)
- August 28, 2024 through November 25, 2024: Formal DLA comment period
- DLA comments addressed in revised RMP, where appropriate
- January 28, 2025: RMP filed as part of the Project FLA

5.2. FUTURE AMENDMENTS TO THE RESOURCES MANAGEMENT PLAN

This RMP will be reviewed internally by SCE Operations staff on an annual basis and included in any environmental training for the Project. Any revisions to this RMP proposed by SCE must be developed in consultation with USFS, USFWS, and CDFW. SCE will allow 30 days for the agencies to comment and to make recommendations on SCE's proposed RMP revisions before filing the proposed revised RMP with FERC for approval. SCE will include with the proposed revised RMP filed with FERC documentation of consultation, copies of recommendations and other comments submitted by the agencies as provided above, and specific descriptions of how the agencies' comments are accommodated by the plan. If SCE does not adopt a recommendation submitted by a consulting agency, SCE's consultation document will include SCE's reasons, based on Project-specific information.

Any amendments to this RMP will become effective upon approval by FERC.

6.0 REFERENCES

Cal-IPC (California Invasive Plant Council). 2012. *Preventing the Spread of Invasive Plants: Best Management Practices for Land Managers (3rd Edition)*. Berkeley,

- CA: Accessed: July 2024. Retrieved from: <https://cal-ipc.org/docs/bmps/dd9jwo1ml8vttq9527zjhek99qr/BMPLandManager.pdf>.
- SCE (Southern California Edison). 1997. *Plan for Control of Erosion, Stream Sedimentation, Soil Mass Movement, and Dust*. FERC Project No. 1388-CA. September 1997.
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- SCE (Southern California Edison). 2022. *Wildfire Mitigation Plan Update*.
- USFS (U.S. Forest Service). 2019. *Forest-Wide Invasive Plant Treatment Project, Environmental Assessment*. Inyo National Forest. April 2019.
- USFWS (U.S. Fish and Wildlife Service). 2024. Survey Protocols, via search feature. Accessed: July 2024. Retrieved from: [https://www.fws.gov/search?\\$keywords=%22survey%20protocols%22](https://www.fws.gov/search?$keywords=%22survey%20protocols%22).