

# Lee Vining Hydroelectric Project

## FERC No. 1388

Welcome!

Using the chat, please write your name, organization, and your favorite piece of outdoor gear.

# 2022 Progress Report Stakeholder Meeting

February 1, 2023

# Welcome and Land Acknowledgment

SCE would like to take a moment and recognize that the Lee Vining Project is located on the Mono Lake Kutzadikaa Tribes' traditional lands, which they have stewarded for generations.

# Safety Moment



# Welcome and Introductions: Lee Vining Relicensing Team

## SCE Team

**Matthew Woodhall**  
Project Manager

**Martin Ostendorf**  
Senior Manager

**Audry Williams**  
Cultural Resources  
Manager

**Seth Carr**  
Operations Manager

**Lyle Laven**  
Production Manager

## Consultant Team

**Shannon Luoma**  
Project Manager

**Finlay Anderson**  
Technical Advisor

**Kelly Larimer**  
Project Director

**Carissa Shoemaker**  
TWG Coordinator

**Heather Neff**  
Aquatics Lead

**Allison Rudalevige** and  
**Steve Norton**  
Terrestrial and Botanical  
Leads

**Lynn Johnson**  
Tribal Lead

**Barb Siskin** and **Jay King**  
Cultural Leads

**Angela Whelpley**  
Recreation and Land Use  
Leads

# Progress Report Meeting Agenda

- Safety moment
- Welcome and introductions
- Meeting objectives
- How we got here (Traditional Licensing Process)
- Review studies, preliminary data summary, 2023 plans
  - Cultural and Tribal
  - Aquatics
  - Terrestrial
  - Recreation and land use
- Schedule, next steps, action items
- Final questions

# Meeting Objectives

- Information sharing and high-level review of preliminary data from 2022 studies
- Preview 2023 field season

# Regulatory and Process Look Back

- SCE is utilizing the Traditional Licensing Process (TLP)
  - The Federal Energy Regulatory Commission (FERC) does not engage until end of process
  - Less structured “formal” milestone schedule around studies
- Study Plans were developed in collaboration with Technical Work Group (TWG) members:
  - 12+ TWG meetings January-May 2021
- Preliminary Application Document and Notice of Intent filed August 2021
- Site Visit and Joint Agency Meeting – fall 2021
- Study Plan revisions – February 2022
- Final Study Plans filed April 2022
- Studies began in 2022, continuing into 2023
- Tech Memos distributed January 23, 2023

# Study Implementation Schedule

Study Plan Title	Year(s) of Implementation
Cultural Resources (CUL-1)	2022-2023
Tribal Resources (TRI-1)	2023
Stream and Reservoir Water Quality (WQ-1)	2022*
Reservoir Fish Populations (AQ-1)	2022
Stream Fish Populations (AQ-2)	2022
Aquatic Habitat Mapping and Sediment Characterization (AQ-3)	2023
Aquatic Invasive Plants (AQ-4)	2023
Operations Model (AQ-5)	2022-2023
Lower Lee Vining Creek Channel Morphology (AQ-6)	2022-2023
Botanical Resources Survey (TERR-1)	2022-2023
Wildlife Resources Survey (TERR-2)	2022-2023
Recreation Use Assessment (REC-1)	2022-2023
Existing Recreation Facilities Condition Assessment (REC-2)	2022-2023
Project Lands and Roads (LAND-1)	2023
Visual Resource Assessment (LAND-2)	2023

\*Study may continue into 2023



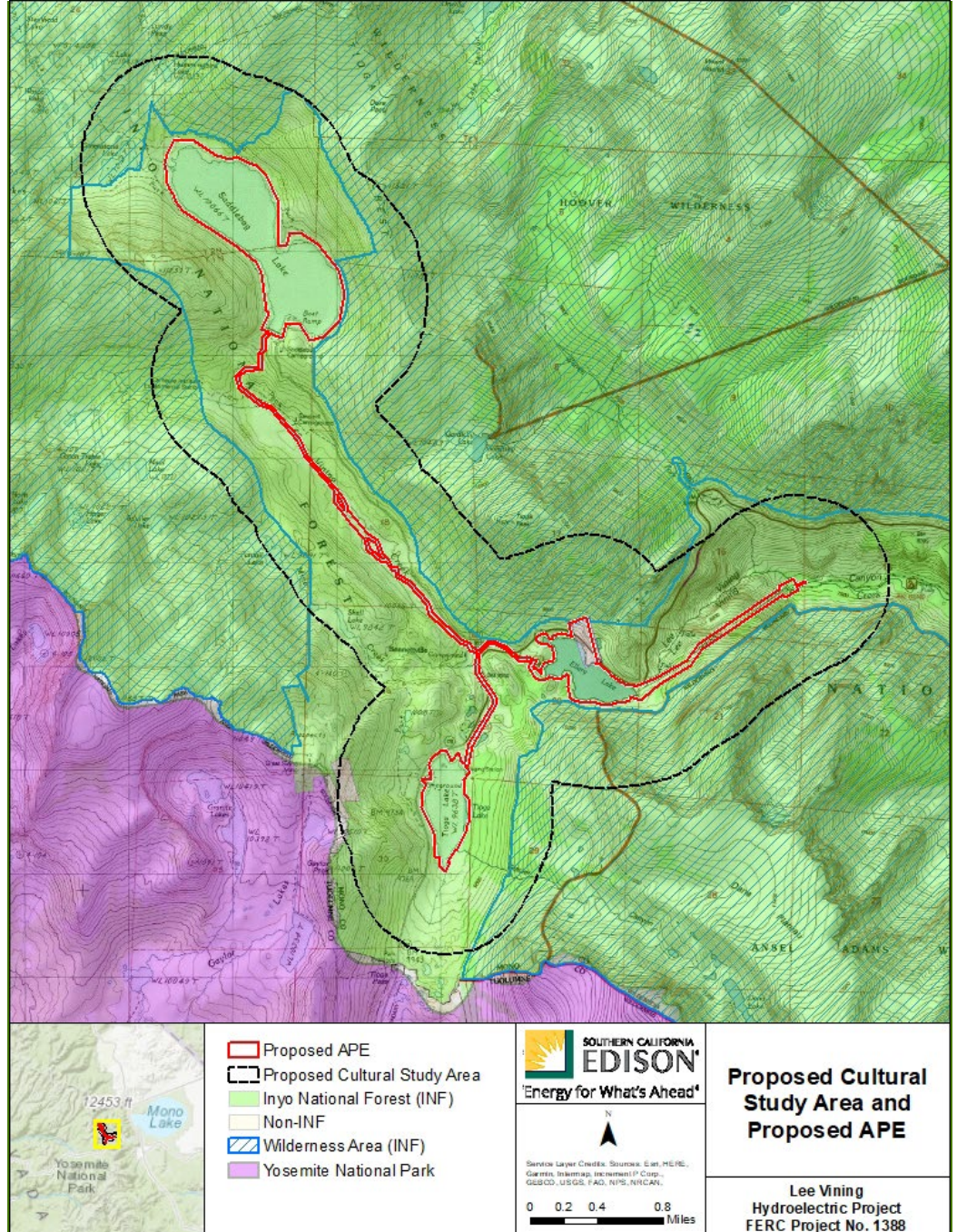
# Regulatory and Process Look Ahead

- Comments on tech memos by February 22, 2023
- Focused TWG meetings for select resources prior to 2023 field season as needed
- Draft technical reports for completed studies to be distributed spring 2023 for 60-day review
- 2023 field season
- Draft technical reports for remaining studies to be distributed fall 2023 and spring 2024 for 60-day review
- Draft License Application due to FERC September 2024
  - Will include final technical reports
- Final License Application due to FERC January 2025
- Lee Vining license expires January 2027

# 2022 (YEAR 1) STUDIES, DATA SUMMARY, & 2023 PLANS

# Cultural Resources (CUL-1)

Area of Potential Effects (APE) and Study Area Map



# Cultural Resources (CUL-1)

## Goals/objectives

- Meet FERC and Section 106 compliance requirements by determining if Project-related activities and public access will have an adverse effect on historic properties
- Identify all archaeological resources, built-environment resources, and Traditional Cultural Resources (TCRs) within the APE; determine which are historic properties; and develop the Historic Properties Management Plan (HPMP) based on those results
- Ensure that future Project facilities and operations are consistent with the desired conditions described in the Land Management Plan for the Inyo National Forest

# Cultural Resources (CUL-1)

## Preliminary data summary

- Completed background research in summer 2022
- Surveyed APE in July and August 2022
- Submitted draft reports in Q1 2023
- Archaeology: recorded 20 resources (16 new), mostly historic-period, including 6 with built environment elements
- Built Environment: recorded 32 resources, including 13 elements of LVHP; Tioga Pass Resort; Saddlebag Lake Resort; Saddlebag Wilderness Cabin; Tioga Road

# Cultural Resources (CUL-1)

Preliminary data summary: National Register of Historic Places (NRHP) Eligibility

- All archaeological resources recommended NRHP ineligible except 3 remaining unevaluated: 2 precontact lithic scatters and a submerged road segment
- All built environment resources recommended NRHP ineligible, including LVHP, except two buildings individually eligible (Poole Powerhouse, Triplex Cottage)
- Evaluation/treatment options to be developed in HPMP

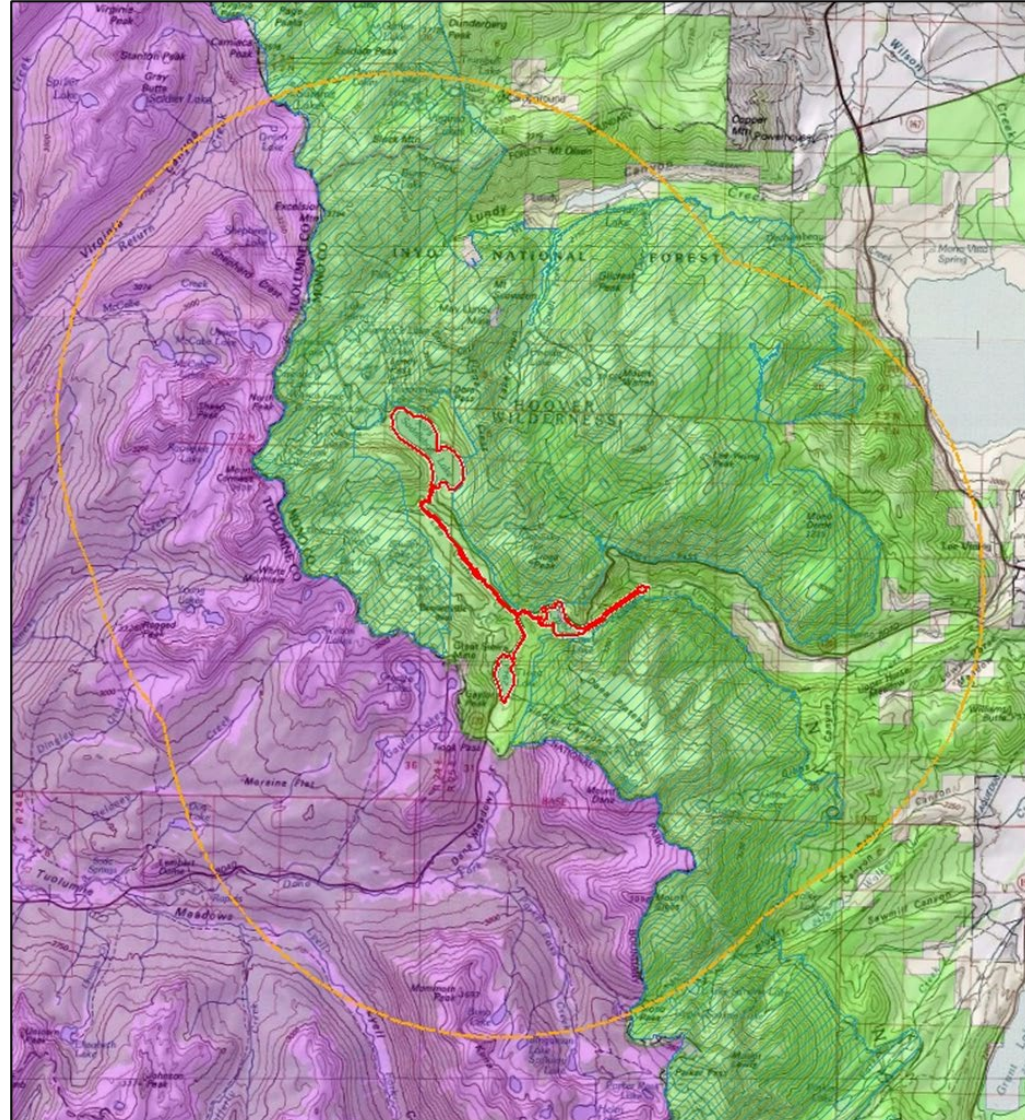
# Cultural Resources (CUL-1)

## Next steps

Date	Activity
2022/2023–Winter	Compile cultural resource survey data and prepare draft reports
2023–January/February	Progress report and meeting
2023–Spring/Fall	Conduct archaeological site evaluations
2023/2024–Winter	Prepare archaeological site evaluation report
2024–Spring	Distribute draft report to stakeholders for review and comment
2024–Summer	Resolve comments and prepare draft final report
2024–Spring/Summer	Prepare draft HPMP
2024–September	Distribute final reports and HPMP in Draft License Application

# Tribal Resources (TRI-1)

## APE and Study Area Map



- ▭ Proposed APE
- Proposed Tribal Study Area
- Inyo National Forest (INF)
- Non-INF
- Wilderness Area (INF)
- Yosemite National Park

**SOUTHERN CALIFORNIA EDISON**  
Energy for What's Ahead<sup>SM</sup>

N

Scale: 0 0.5 1 2 Miles

Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN,...

**Proposed Tribal Study Area and Proposed APE**

Lee Vining Hydroelectric Project  
FERC Project No. 1388



# Tribal Resources (TRI-1)

## Methods

- Archival research
- Assist other resource specialists
- Meetings with Tribal governments
- Interviews
- Documentation and evaluation
- Reporting and Historic Properties Management Plan

## 2022 Data Summary

- Background research was conducted in 2022, study will commence in 2023 with interviews

# Tribal Resources (TRI-1)

## Next steps

<b>Date</b>	<b>Activity</b>
<b>2023– January/February</b>	Progress report and meeting
<b>2023–Summer/Fall</b>	Conduct Tribal site visits; identification and evaluation of Tribal resources
<b>2023/2024–Winter</b>	Prepare draft TRI-1 Study Report
<b>2024–Spring</b>	Distribute draft report to stakeholders for review and comment
<b>2024-Spring</b>	Prepare draft Tribal resource HPMP for review and comment
<b>2024–Summer</b>	Resolve comments and prepare final reports
<b>2024–September</b>	Distribute final reports and HPMP in Draft License Application

# Questions?



# Fish, Aquatics, and Hydrology Studies

1. Water Quality Study (WQ-1)
2. Reservoir Fish Populations (AQ-1)
3. Stream Fish Populations (AQ-2)
4. Operations Model (AQ-5)
5. Lower Lee Vining Creek Channel Morphology (AQ-6)

# Stream and Reservoir Water Quality (WQ-1)

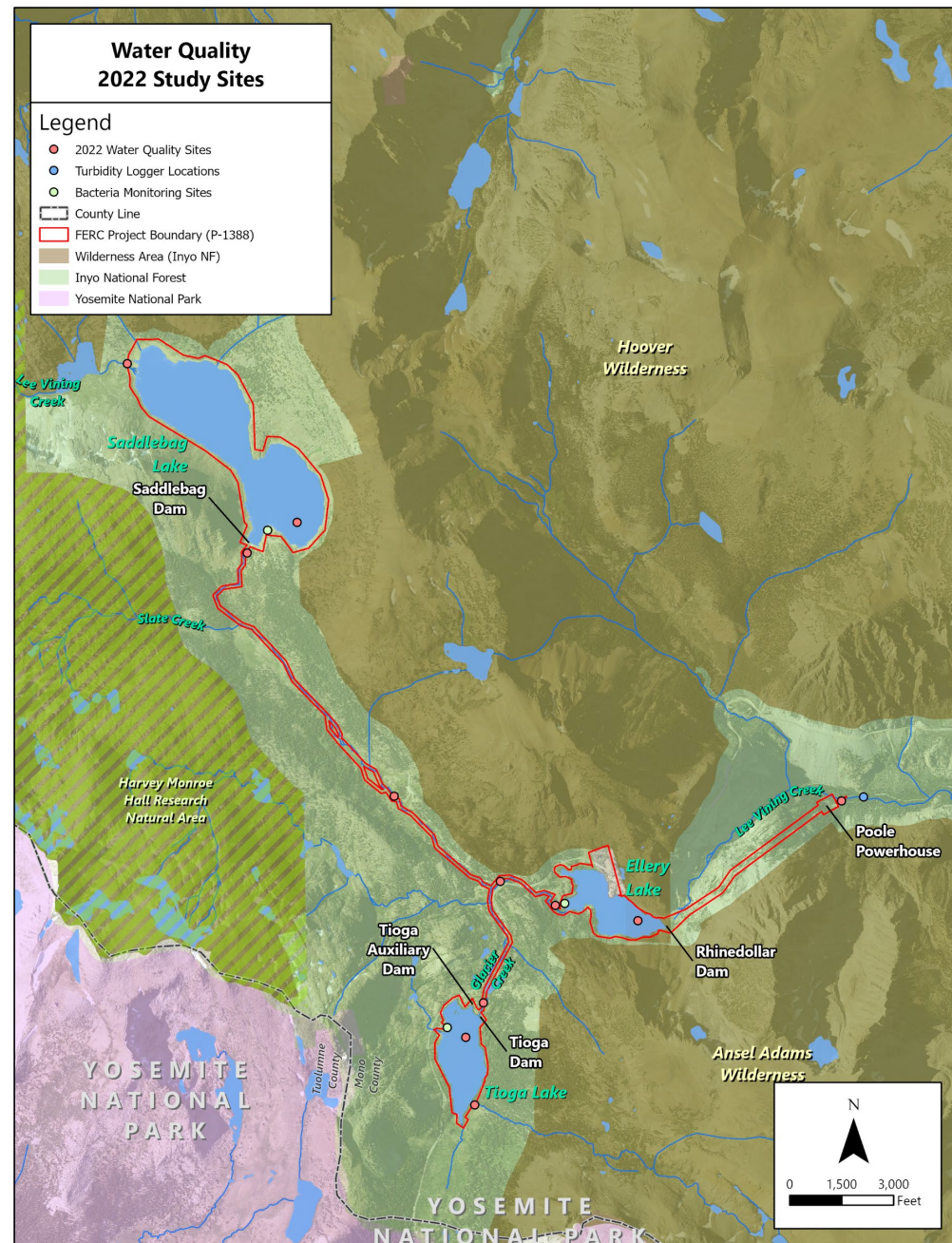
## Study Area Map



# Stream and Reservoir Water Quality (WQ-1)

## Study Sites:

- Saddlebag, Ellery, Tioga lakes (1 WQ site per lake)
- Upper Lee Vining Creek (5 WQ sites)
- Lower Lee Vining Creek (2 WQ sites, 2 turbidity sites)
- Glacier Creek (2 WQ sites)



# Stream and Reservoir Water Quality (WQ-1)

## Study Goals/Objectives

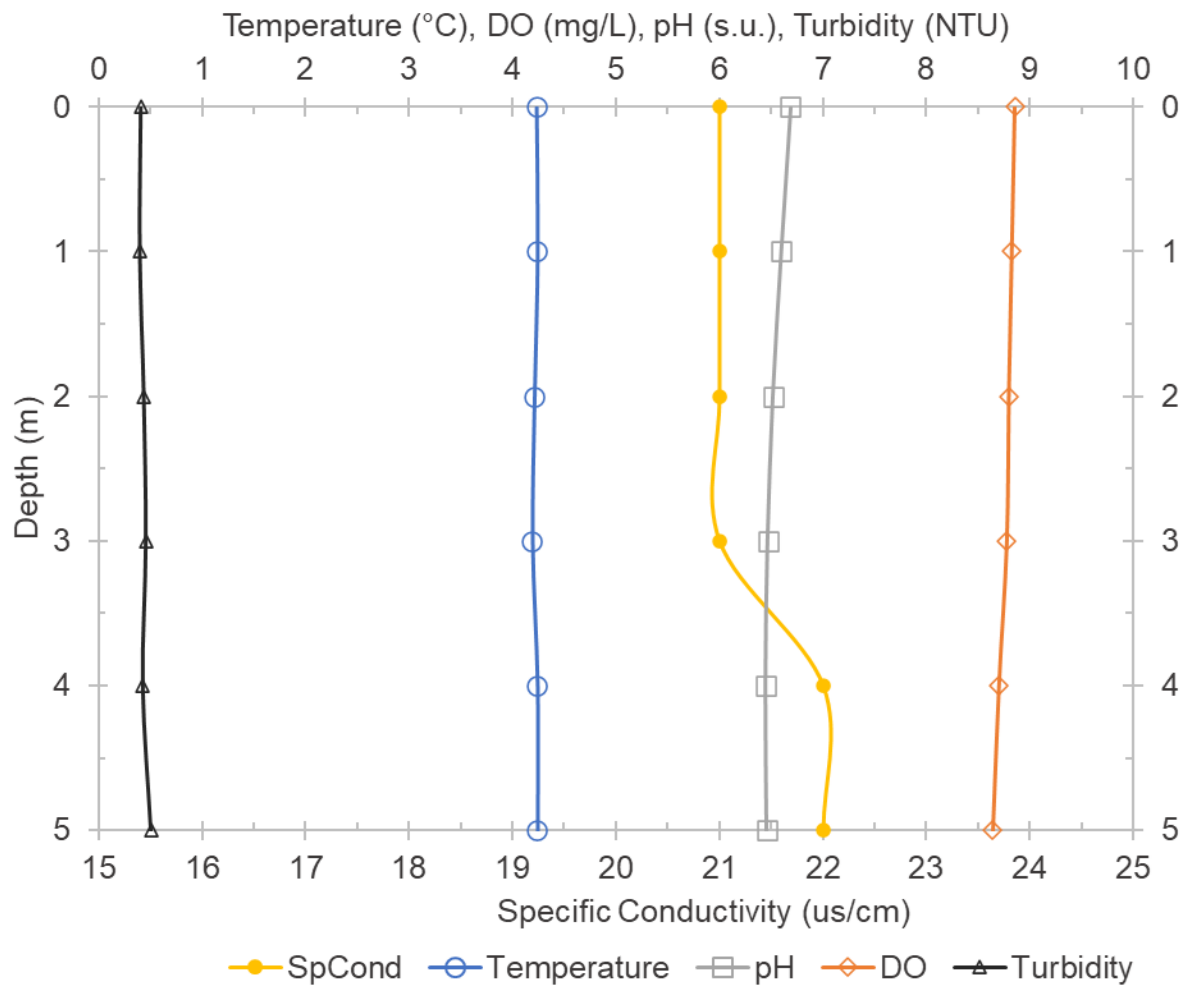
- Assess consistency of Project reservoirs and Project-affected stream reaches with water quality objectives in the Lahontan Region Water Quality Control Board Basin Plan

## Modifications to Methods

- Extensive ice cover on Saddlebag Lake prevented collection of depth profiles at maximum depth during spring
- Analytical samples were not collected at depth from Saddlebag Lake and Tioga Lake during summer
- Turbidity logger installation was delayed from spring to summer, loggers were moved to new locations in October 2022
- *In situ* turbidity was not measured during summer (probe malfunction)
- Eight out of nine edible-sized individuals of rainbow trout were caught at Tioga Lake (with nine of nine required brook trout captured)

# Stream and Reservoir Water Quality (WQ-1)

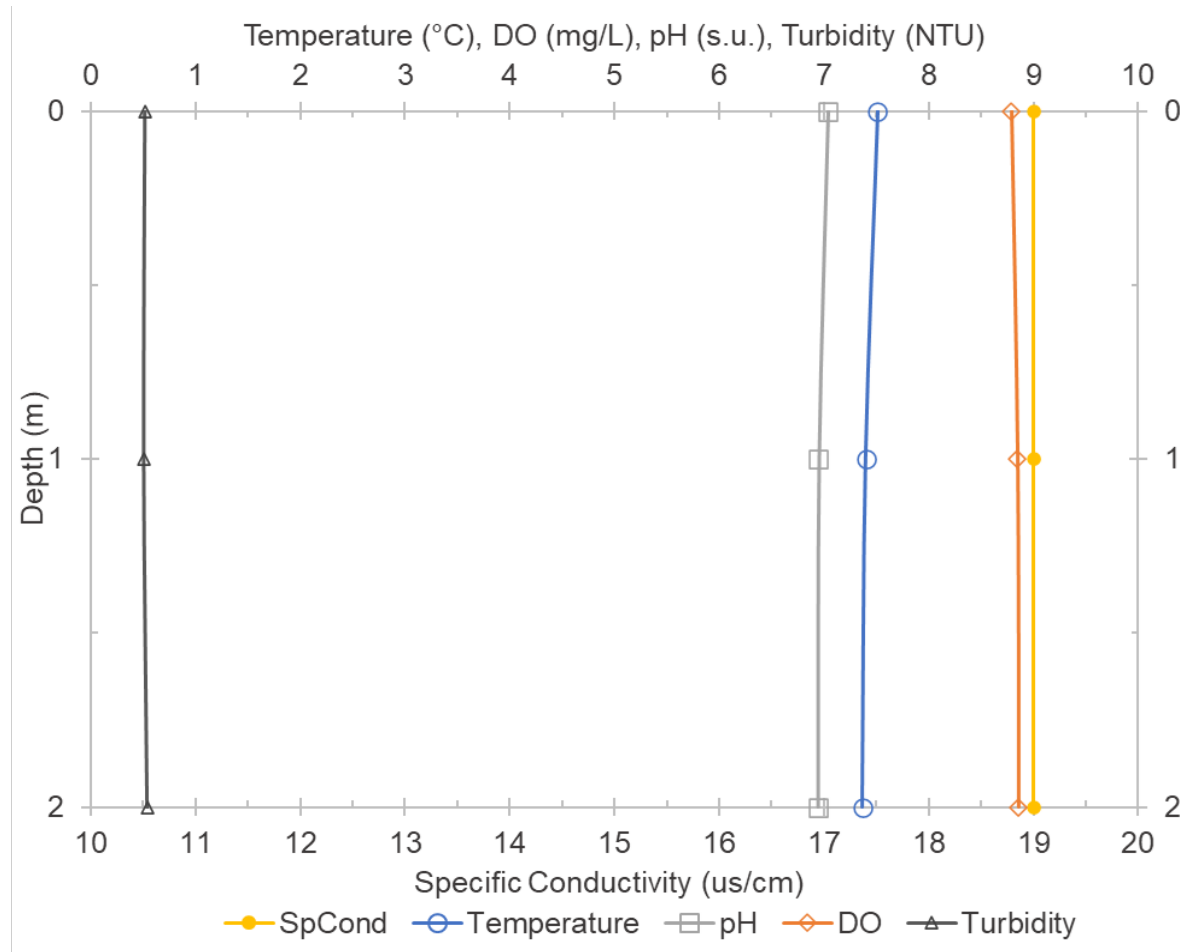
Saddlebag Lake – *In Situ* Spring 2022





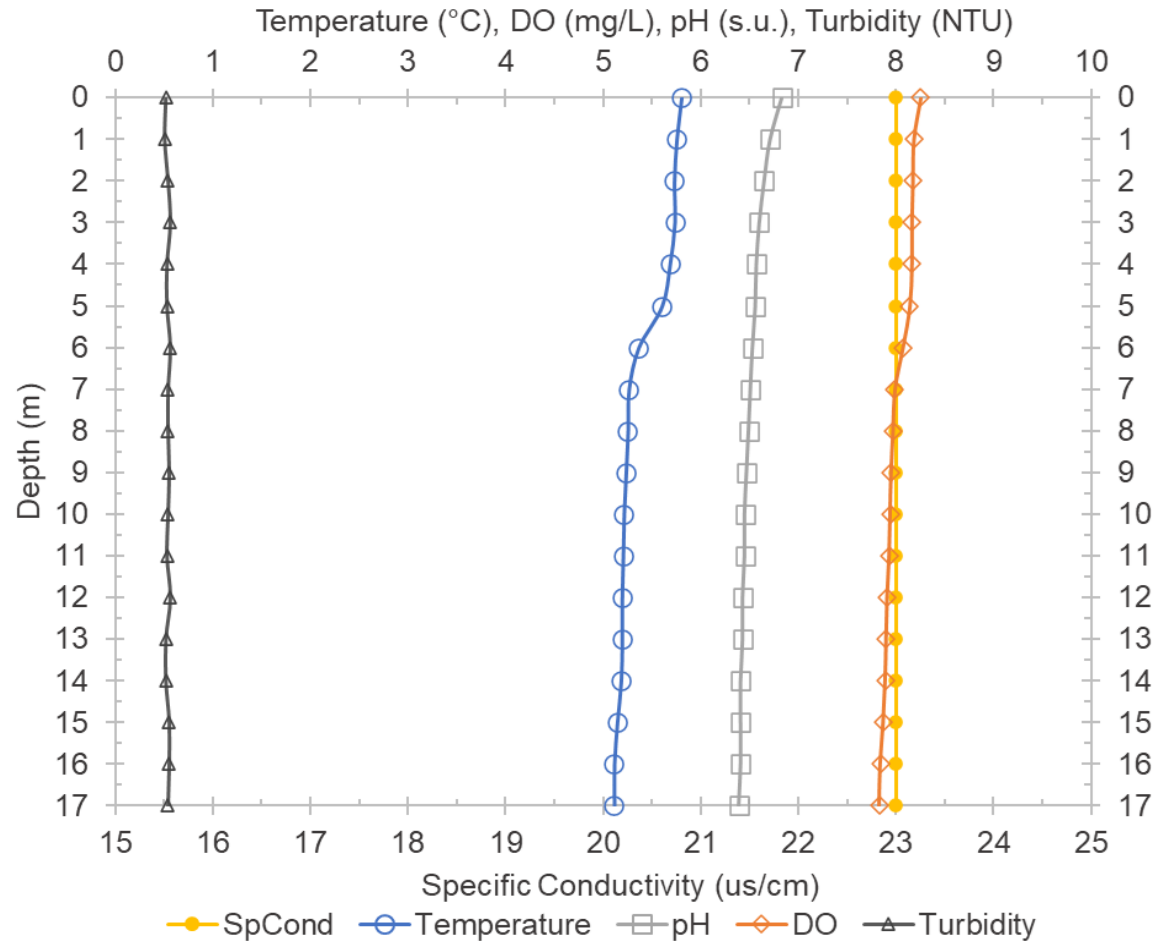
# Stream and Reservoir Water Quality (WQ-1)

## Ellery Lake – *In Situ* Spring 2022



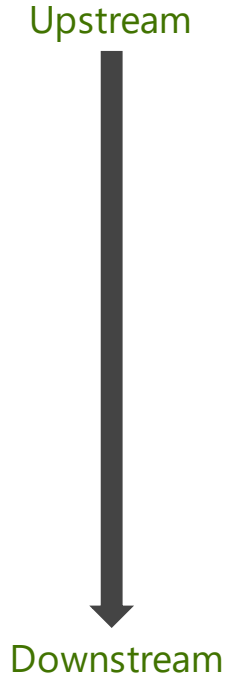
# Stream and Reservoir Water Quality (WQ-1)

## Tioga Lake – *In Situ* Spring 2022



# Stream and Reservoir Water Quality (WQ-1)

## Lee Vining Creek – *In Situ* Spring 2022




Description	Water Temperature (°C)	DO (mg/L)	Specific Conductance (µS/cm)	pH (s.u.)	Turbidity (NTU)
<b>Lee Vining Creek</b>					
Inflow to Saddlebag Lake	5.9	9.0	9	6.9	0.8
Between Saddlebag Dam and its confluence with Slate Creek	4.1	9.0	23	6.8	0.7
Between its confluence with Slate Creek and Glacier Creek	2.5	9.8	18	6.7	0.4
Between its confluence with Glacier Creek and Ellery Lake	1.9	10.0	20	6.8	0.4
Inflow to Ellery Lake	2.1	9.9	21	7.0	0.3
Immediately downstream of Poole Powerhouse	5.5	9.0	29	7.0	0.3
Upstream of the LADWP Diversion	4.8	9.9	35	7.3	0.7

# Stream and Reservoir Water Quality (WQ-1)

## Glacier Creek – *In Situ* Spring 2022

Upstream



Downstream

Description	Water Temperature (°C)	DO (mg/L)	Specific Conductance (µS/cm)	pH (s.u.)	Turbidity (NTU)
Glacier Creek					
Inflow to Tioga Lake	7.6	8.7	29	7.2	0.2
Downstream of Tioga Dam	6.0	8.4	23	6.8	0.5

# Stream and Reservoir Water Quality (WQ-1)

## Lee Vining Creek Watershed– Analytical Spring 2022

Description	Basic Water Quality		Nutrients				
	TDS (mg/L)	TSS (mg/L)	NO <sub>3</sub> <sup>-</sup> NO <sub>2</sub> <sup>-</sup> as N (mg/L)	NH <sub>4</sub> as N (mg/L)	TKN (mg/L)	TP (mg/L)	PO <sub>4</sub> (mg/L)
Lee Vining Cr. inflow to Saddlebag Lake	9 <sup>J</sup>	<2	0.120 <sup>J</sup>	<0.025	0.065 <sup>J</sup>	<0.023	<0.0051 <sup>HT-1</sup>
Saddlebag Lake	21	<2	0.063 <sup>J</sup>	<0.025	0.048 <sup>J</sup>	<0.023	<0.0051 <sup>HT-1</sup>
Lee Vining Cr. between Saddlebag Dam and its confluence with Slate Creek	15	<2	0.075 <sup>J</sup>	0.036 <sup>J</sup>	0.057 <sup>J</sup>	<0.023	0.026 <sup>A-COM, J</sup>
Lee Vining Creek between its confluence with Slate Creek and Glacier Creek	12	<2	0.077 <sup>J</sup>	0.038 <sup>J</sup>	0.084 <sup>J</sup>	<0.023	0.043 <sup>A-COM, J</sup>
Lee Vining Creek between its confluence with Glacier Creek and Ellery Lake	10	<2	0.076 <sup>J</sup>	<0.025	0.081 <sup>J</sup>	<0.023	0.039 <sup>A-COM, J</sup>
Lee Vining Creek inflow to Ellery Lake	15	<2	0.074 <sup>J</sup>	0.026 <sup>J</sup>	0.077 <sup>J</sup>	<0.023	0.006 <sup>A-COM, J</sup>
Ellery Lake	12	<2	0.062 <sup>J</sup>	<0.025	0.072 <sup>J</sup>	<0.023	<0.0051
Lee Vining Creek immediately downstream of Poole Powerhouse	21	<2	0.065 <sup>J</sup>	<0.025	0.060 <sup>J</sup>	<0.023	0.018 <sup>A-COM, J</sup>
Lee Vining Creek upstream of the LADWP Diversion	23	<2	0.079 <sup>J</sup>	<0.025	0.100 <sup>J</sup>	<0.023	<0.0051 <sup>A-COM</sup>
Detection Limit (DL)	5	2	0.055	0.025	0.04	0.023	0.0051
Reporting Limit (RL)	10	5	0.4	0.1	0.2	0.05	0.15

Upstream



Downstream

# Stream and Reservoir Water Quality (WQ-1)

## Glacier Creek Watershed– Analytical Spring 2022

Description	Basic Water Quality		Nutrients				
	TDS (mg/L)	TSS (mg/L)	NO <sub>3</sub> -NO <sub>2</sub> as N (mg/L)	NH <sub>4</sub> as N (mg/L)	TKN (mg/L)	TP (mg/L)	PO <sub>4</sub> (mg/L)
<b>Glacier Creek Watershed</b>							
Glacier Creek inflow to Tioga Lake	23	<2.0	0.110 <sup>J</sup>	0.031 <sup>J</sup>	0.110 <sup>J</sup>	<0.023	0.014 <sup>J</sup>
Tioga Lake	17	<2.0	0.087 <sup>J</sup>	0.066 <sup>J</sup>	0.150 <sup>J</sup>	<0.023	0.026 <sup>J</sup>
Glacier Creek downstream of Tioga Dam	22	<2.0	0.082 <sup>J</sup>	0.054 <sup>J</sup>	0.170 <sup>J</sup>	<0.023	0.018 <sup>J</sup>
Detection Limit (DL)	5	2	0.055	0.025	0.04	0.023	0.0051
Reporting Limit (RL)	10	5	0.4	0.1	0.2	0.05	0.15

Upstream



Downstream

# Stream and Reservoir Water Quality (WQ-1)

## Next Steps

- Data analysis and summary of
  - reservoir and stream *in situ*, basic water chemistry, and nutrient data
  - bacterial data
  - fish tissue mercury analysis
  - turbidity downstream of Poole Powerhouse
  - comparison to Lahontan Region Water Quality Control Board Basin Plan water quality objectives
- 2022 results will be summarized in a Technical Report and provided to stakeholders in spring of 2023

# Stream and Reservoir Water Quality (WQ-1)

Study Component	2022	2023
Stream and reservoir <i>in situ</i> , basic water chemistry, and nutrient water quality sampling	✓	Yes
Bacterial sampling	✓	No
Turbidity monitoring downstream of Poole Powerhouse	✓ (summer–winter)	Yes (winter–fall)
Fish tissue mercury sampling	✓	No

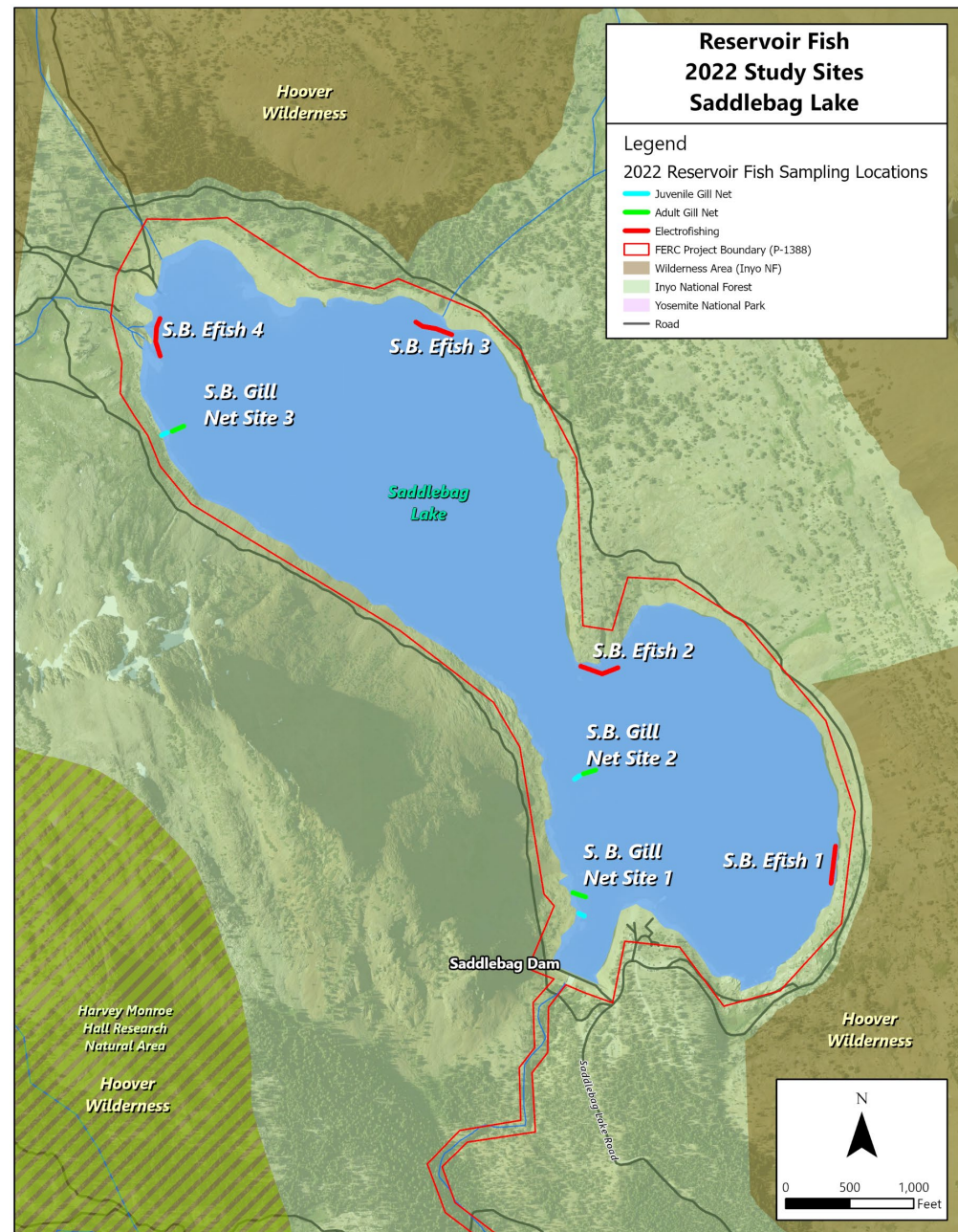


# Questions?



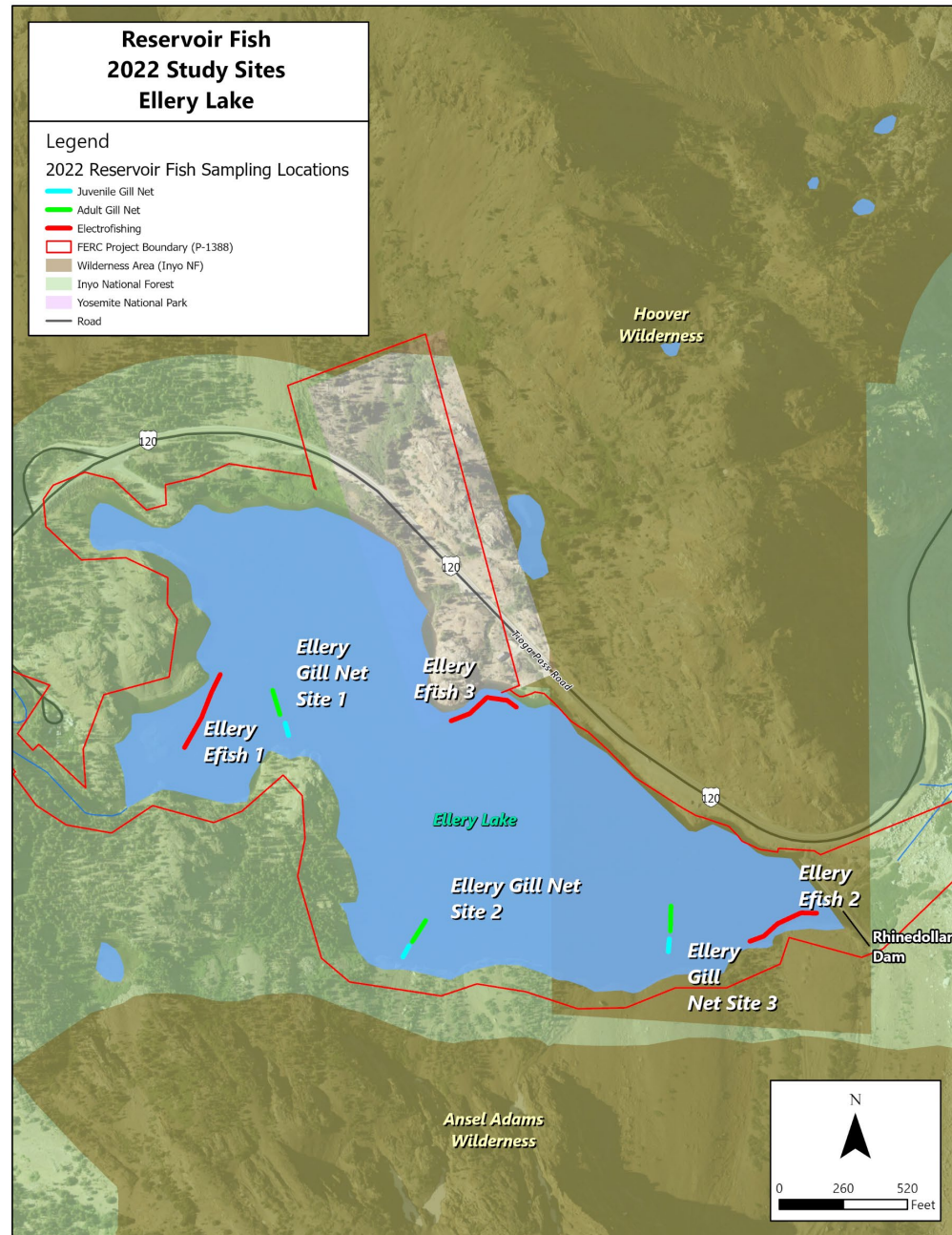
# Reservoir Fish Populations (AQ-1)

Reservoir Fish 2022 Study Sites—  
Saddlebag Lake



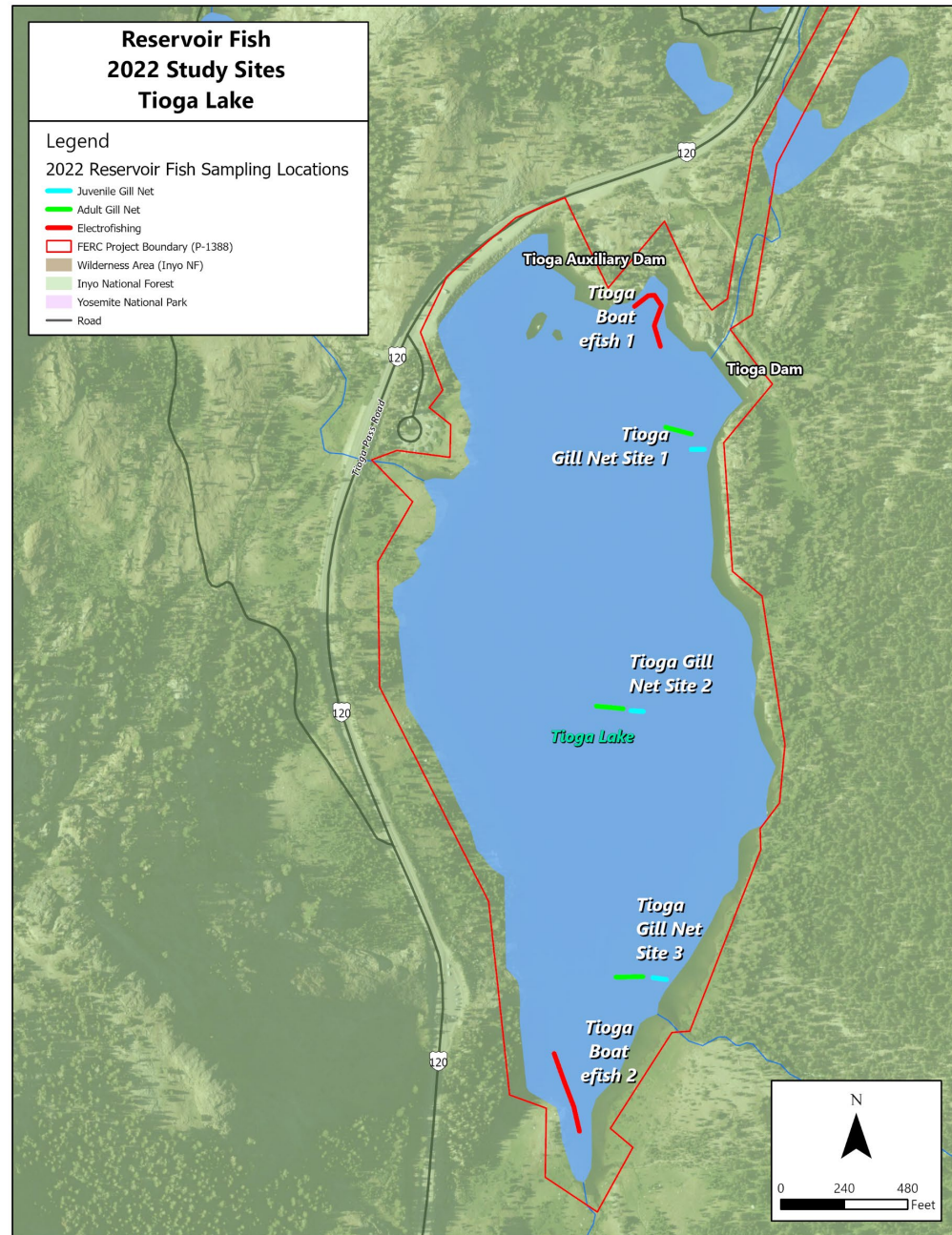
# Reservoir Fish Populations (AQ-1)

## Reservoir Fish 2022 Study Sites—Ellery Lake



# Reservoir Fish Populations (AQ-1)

## Reservoir Fish 2022 Study Sites—Tioga Lake



# Reservoir Fish Populations (AQ-1)

## Study Goals/Objectives

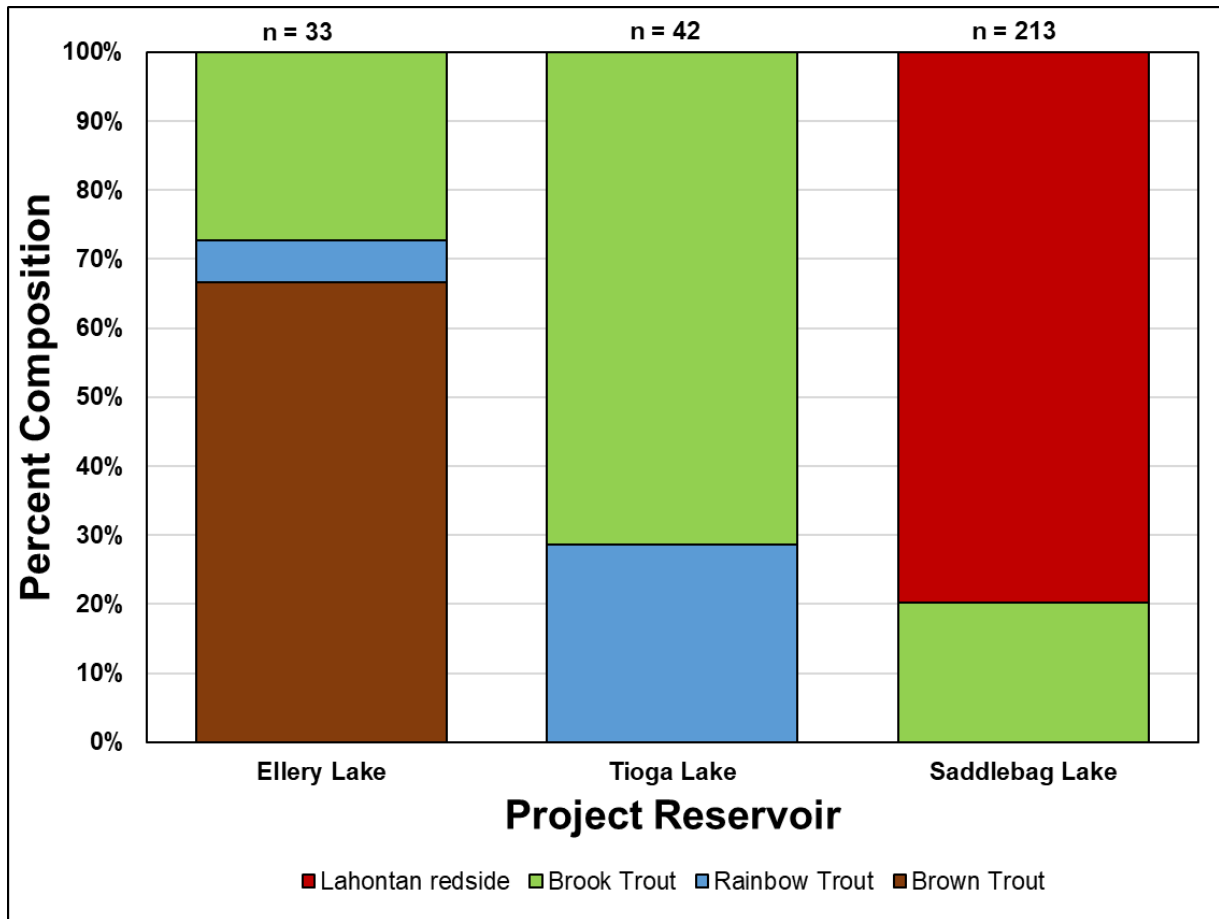
- Assess fish populations within Project reservoirs
- Capture fish for mercury bioaccumulation analyses under Study WQ-1

## Modifications to Methods

- Decreased gill net soak times during the night sampling period from approximately 8 hours to approximately 4 hours at Tioga Lake (for all gill net locations) and at Saddlebag Lake (at two gill net locations)

# Reservoir Fish Populations (AQ-1)

## Preliminary Data Summary – Species Composition



Lahontan reidside



Brook trout

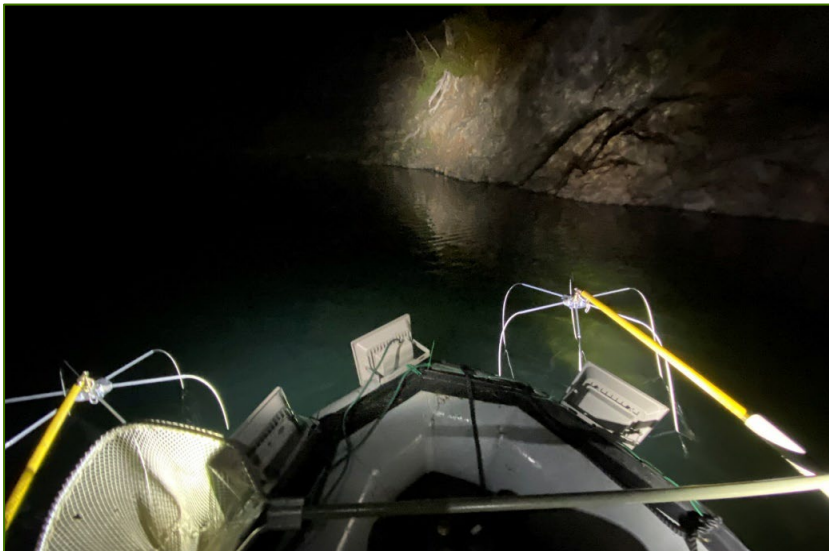


Brown trout

# Reservoir Fish Populations (AQ-1)

## Next Steps

- Surveys were completed in 2022, no additional surveys are planned
- Analysis of sampling data is ongoing and includes age-class evaluations from scale samples and catch-per-unit-effort analyses
- Study results will be summarized in a Technical Report and provided to stakeholders in spring of 2023



**Nighttime Boat Electrofishing at Ellery Lake**



**Gillnetting at Ellery Lake**



# Questions?



# Stream Fish Populations (AQ-2)

## Study Area Map



# Stream Fish Populations (AQ-2)

## Study Goals/Objectives

- Assess fish populations in Project-affected stream reaches downstream of Project reservoirs

## Modifications to Methods

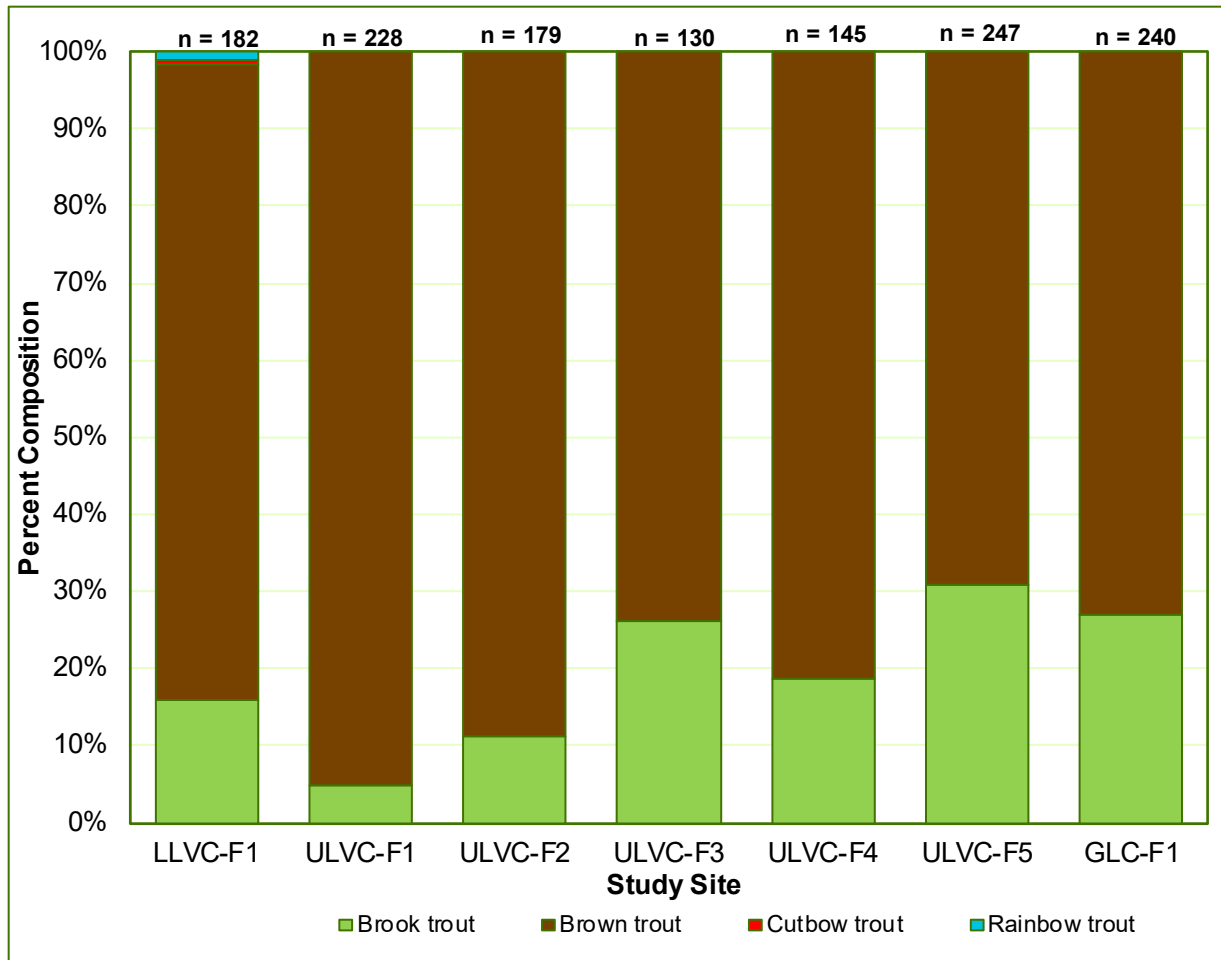
- None



Glacier Creek (Site GLC-F1)

# Stream Fish Populations (AQ-2)

## Preliminary Data Summary – Species Composition



Brook trout



Brown trout



Rainbow trout

# Stream Fish Populations (AQ-2)

## Preliminary Data Summary – Spawning

Reach Description	Study Site	Sample Date	Number of Milting Fish	Species
Lee Vining Creek downstream of Poole Powerhouse	LLVC-F1	9/19/2022	none	--
Lee Vining Creek downstream of Saddlebag Lake	ULVC-F1	9/20/2022	1	brown trout
	ULVC-F2	9/22/2022	2	brown trout
	ULVC-F3	9/16/2022	none	--
	ULVC-F4	9/17/2022	none	--
	ULVC-F5	9/18/2022	2	brown trout
	ULVC-F5	9/18/2022	1	brook trout
Glacier Creek downstream of Tioga Lake	GLC-F1	9/21/2022	1	brown trout
	GLC-F1	9/21/2022	4	brook trout

# Stream Fish Populations (AQ-2)

## Next Steps

- Surveys were completed in 2022, no additional surveys are planned
- Analysis of sampling data is ongoing
- Completed results will be summarized in a Technical Report and provided to stakeholders in spring of 2023
- Results will be summarized by site for:
  - Density and biomass estimates
  - Fish age class
  - Fish condition
  - Habitat conditions

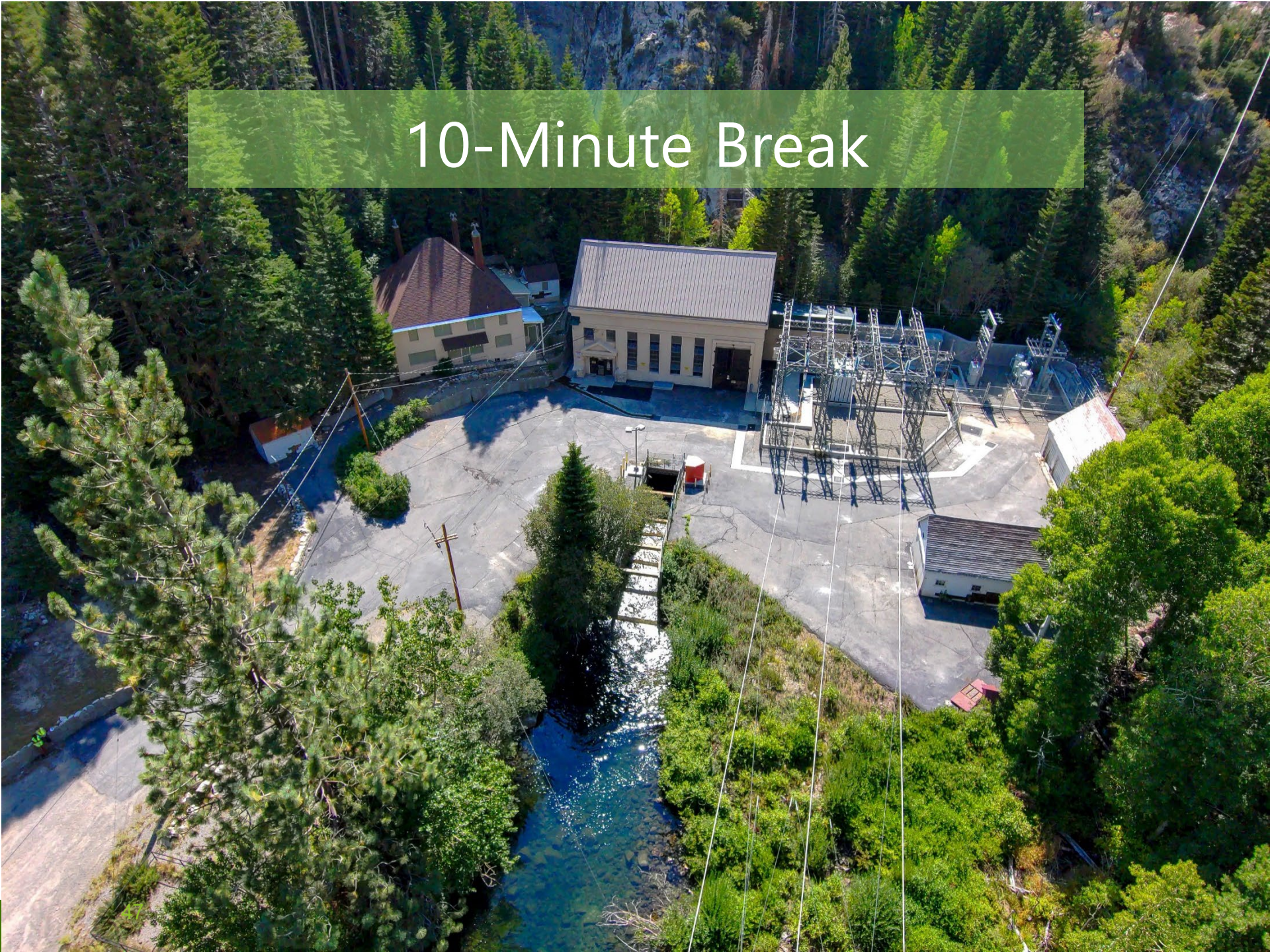


Lee Vining Creek upstream of Glacier Creek (Site ULVC-F2)

# Questions?

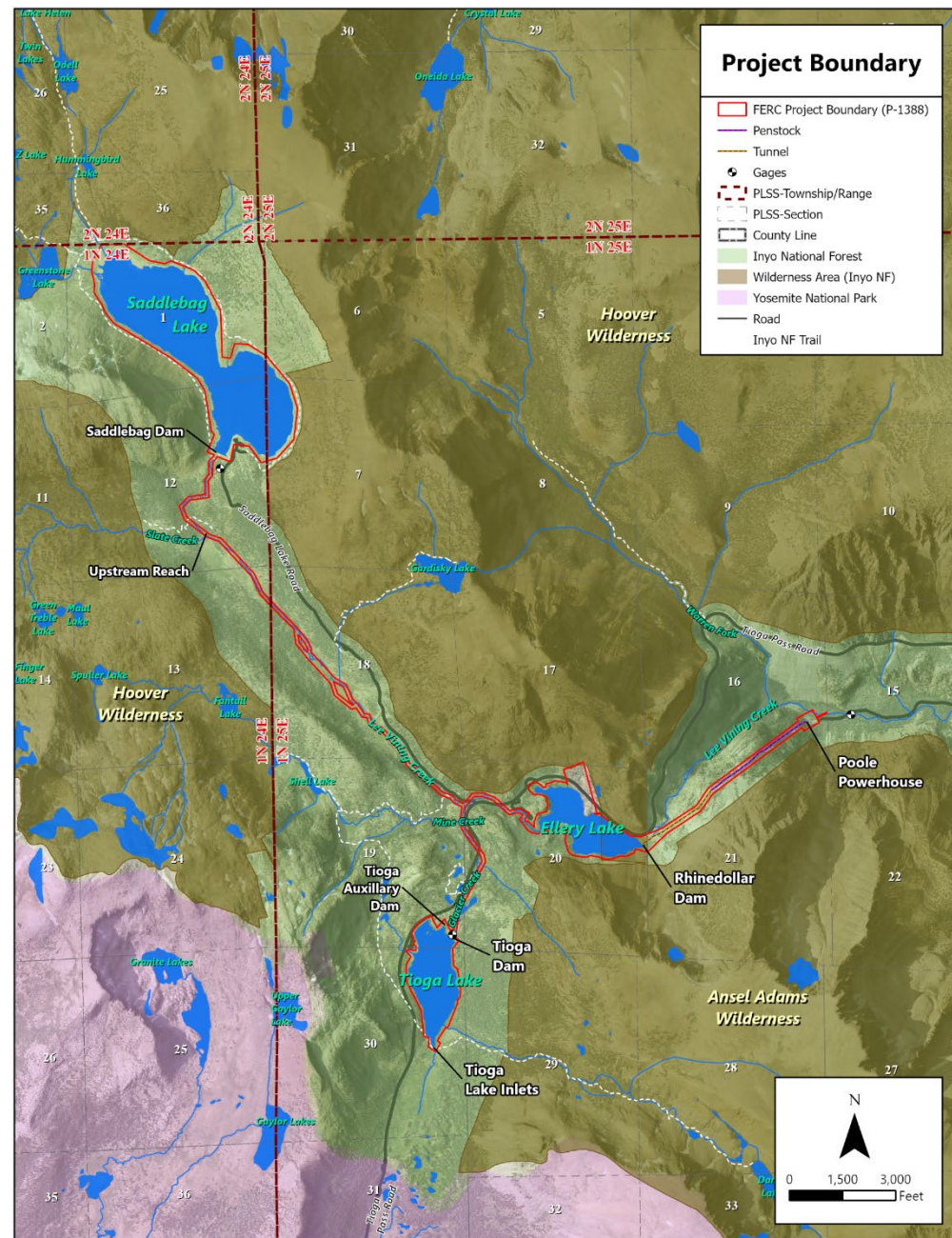


# 10-Minute Break



# Operations Model (AQ-5)

## Study Area Map





# Operations Model (AQ-5)

## Goals/Objectives for Operations Model

- Develop a robust Operations Model (Model) to assist SCE and stakeholders in understanding how Project operations interact with Lee Vining hydrology
- Accurately model the systems inflows, outflows, and operational constraints
- Align model with needs of other relicensing studies and information needs
- Develop procedures to configure model for alternative operational scenarios and document results
- Determine effective operating limits the Poole Powerhouse to accurately represent installed and dependable capacity for licensing documents

## Modifications to Methods

- None

# Operations Model (AQ-5)

## 2022 Progress

- Data analysis
  - U.S. Geologic Survey gage records (streamflow, reservoir storage)
  - Snow course
  - 15-minute flow data at Poole Powerhouse
  - Warren Fork flows considered
- Daily operations model
  - Excel platform
  - Daily inflows estimated from hydrologic records
    - Synthesized where necessary
  - Hydraulic constraints: reservoir storage curves, spillway elevations, penstock/turbine capacities
  - Prioritization/allocation:
    - Wet/normal/dry year categorization
    - Minimum flow requirements
    - Reservoir limits/targets

# Operations Model (AQ-5)

## Goals/Objectives for Resource Optimization Model

- Determine the frequency, magnitude, duration, and seasonality of intraday releases from the Poole Powerhouse in response to resource optimization
- Describe the stage/discharge relationship at discreet locations between the Poole Powerhouse and the Los Angeles Department of Water and Power (LADWP) diversion

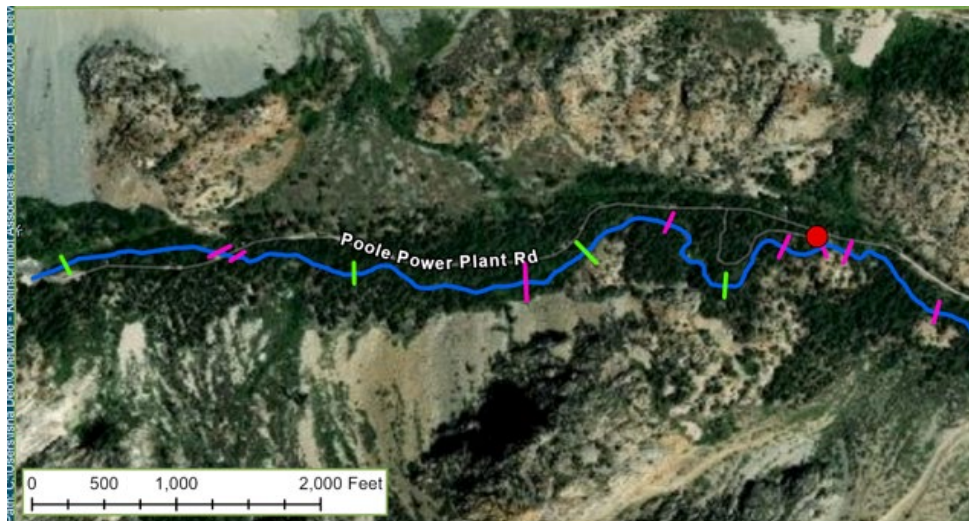
## Modifications to Methods

- None

# Operations Model (AQ-5)

## 2022 Progress

- Operations Model Data analysis
  - Flow data from Poole Powerhouse, LADWP gage
  - Generation data from Entergy
- Resource Optimization Model analysis
  - Data sources: intra-day flow and target capacity data
  - Identify flow patterns (flood-related peaks from resource optimization peaks)
- Stage/discharge relationship
  - Data procurement in progress to develop hydraulic model
  - Considering potential effects of operations on downstream areas, including campgrounds



### Legend

- Campground
- LeeViningCreek
- CrossSections
- Priority
- 1
- 2

# Operations Model (AQ-5)

## Next Steps

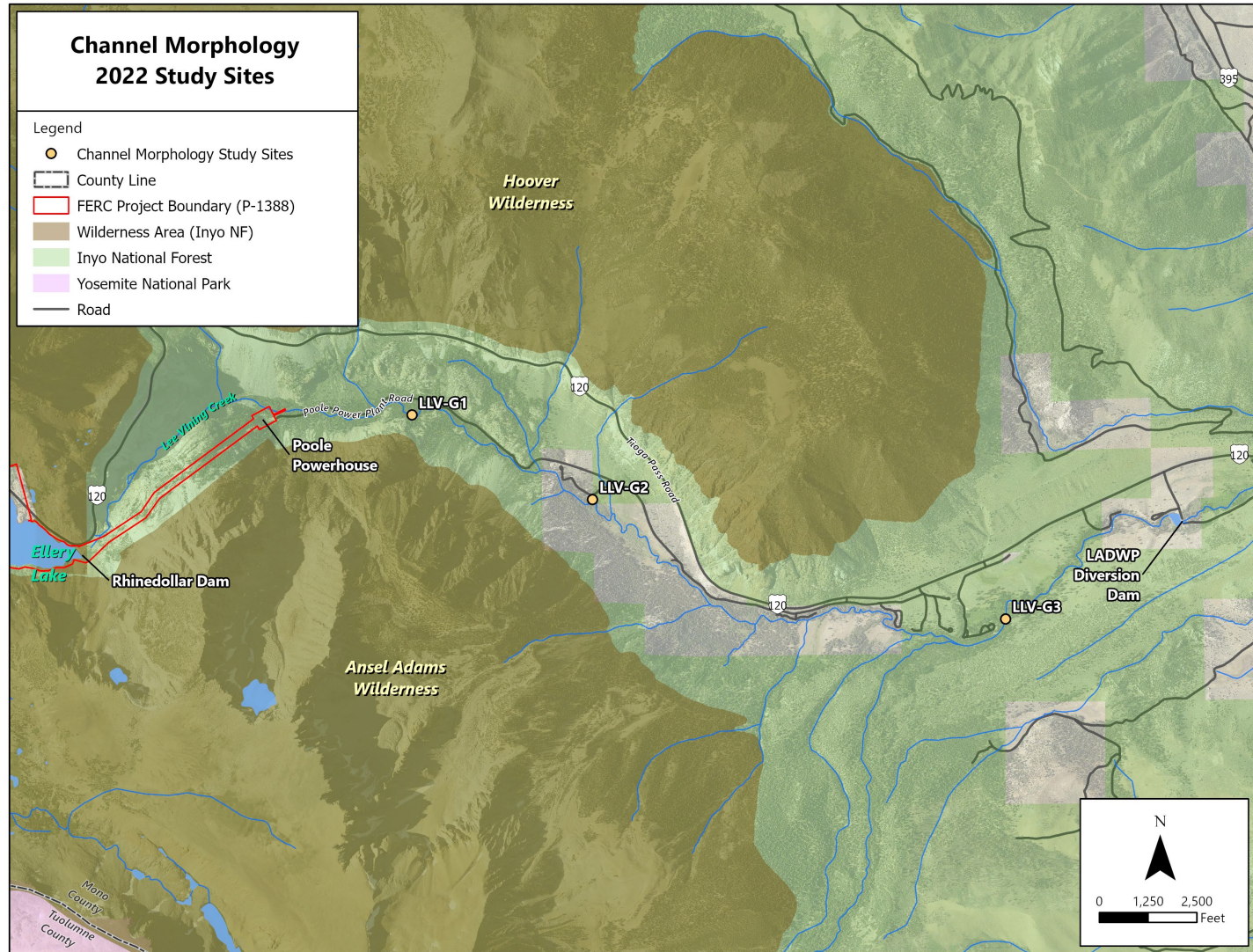
- Construct the model logic and calibrate to hydrologic data records
- Receive quality-controlled data from field surveys
- Determine how model and study data are used to evaluate agency goals (desired outcome)
- Distribute model for review and comment once complete; fall 2023

# Questions?



# Lower Lee Vining Creek Channel Morphology (AQ-6)

## Study Area Map



# Lower Lee Vining Creek Channel Morphology (AQ-6)

## Study Goals

- Evaluate impacts of altering sediment supply in Lower Lee Vining Creek
- Support development of Protection, Mitigation, and Enhancement

## Specific Objectives

- Classify transport and response reaches
- Characterize channel morphology, fluvial processes, and sediment regime

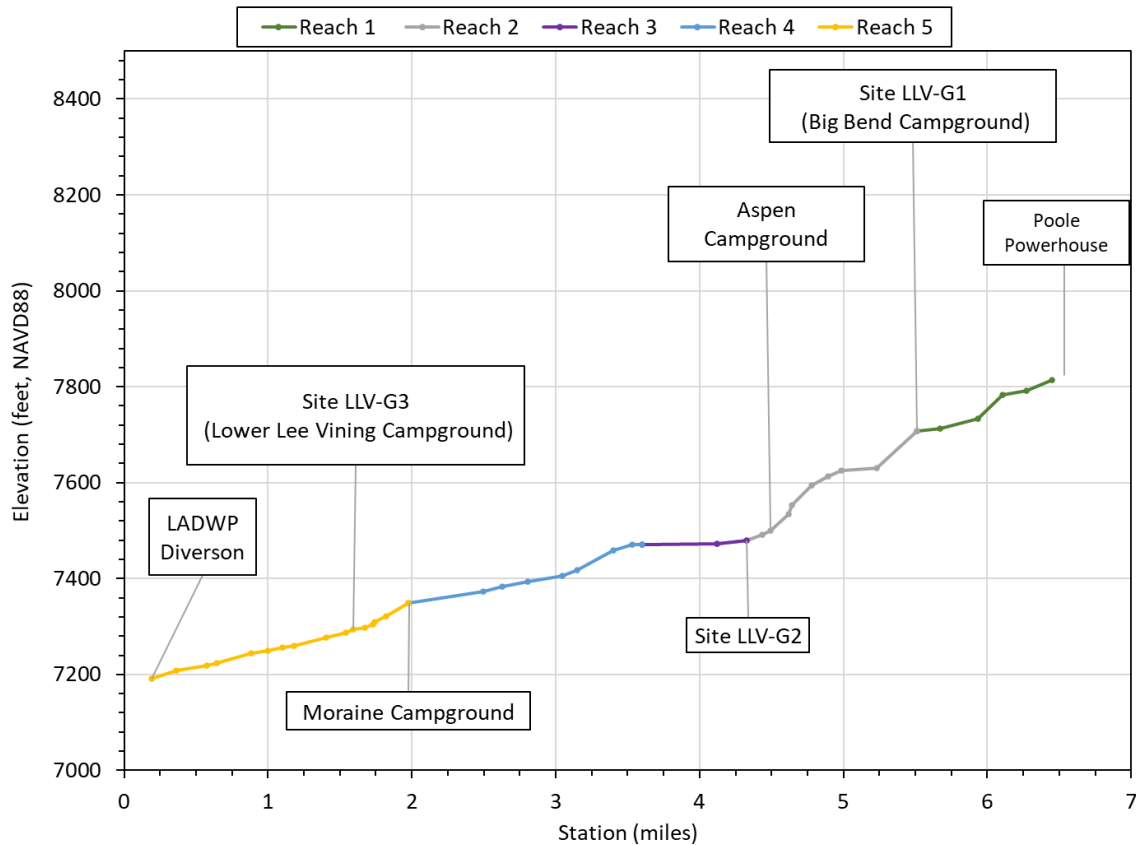
## Modifications to Methods

- None



# Lower Lee Vining Creek Channel Morphology (AQ-6)

## Preliminary Data Summary



Reach	Length (ft)	Gradient (%)
Reach 1 – Poole Powerhouse to Big Bend Campground	4020	2.1
Reach 2 - Big Bend Campground to Aspen Meadow	6230	3.7
Reach 3 - Aspen Meadow	3840	0.2
Reach 4 – Below Aspen Meadow to LLVCG	8570	1.4
Reach 5 - LLVCG to LADWP	9450	1.7

# Lower Lee Vining Creek Channel Morphology (AQ-6)

Preliminary Data Summary – Site LLV-G1



<b>Summary of Data Collected</b>
4 cross sections
3 bulk sediment samples
64 tracer rocks deployed
Longitudinal profile
Sediment facies map

# Lower Lee Vining Creek Channel Morphology (AQ-6)

## Preliminary Data Summary – Site LLV-G2



<b>Summary of Data Collected</b>
4 cross sections
3 bulk sediment samples
69 tracer rocks deployed
1 pebble count
Longitudinal profile
Sediment facies map

# Lower Lee Vining Creek Channel Morphology (AQ-6)

Preliminary Data Summary – Site LLV-G3



<b>Summary of Data Collected</b>
3 cross sections
3 bulk sediment samples
67 tracer rocks deployed
1 pebble count
Longitudinal profile
Sediment facies map

# Lower Lee Vining Creek Channel Morphology (AQ-6)

## Next Steps

- Data synthesis and analysis (sediment particle size analysis, sediment transport calcs, geomorphic assessment)
- Tracer rocks will be recovered from lower Lee Vining Creek after peak flows occur in 2023
- Study results will be summarized in a Technical Report for stakeholder review in 2024



# Questions?



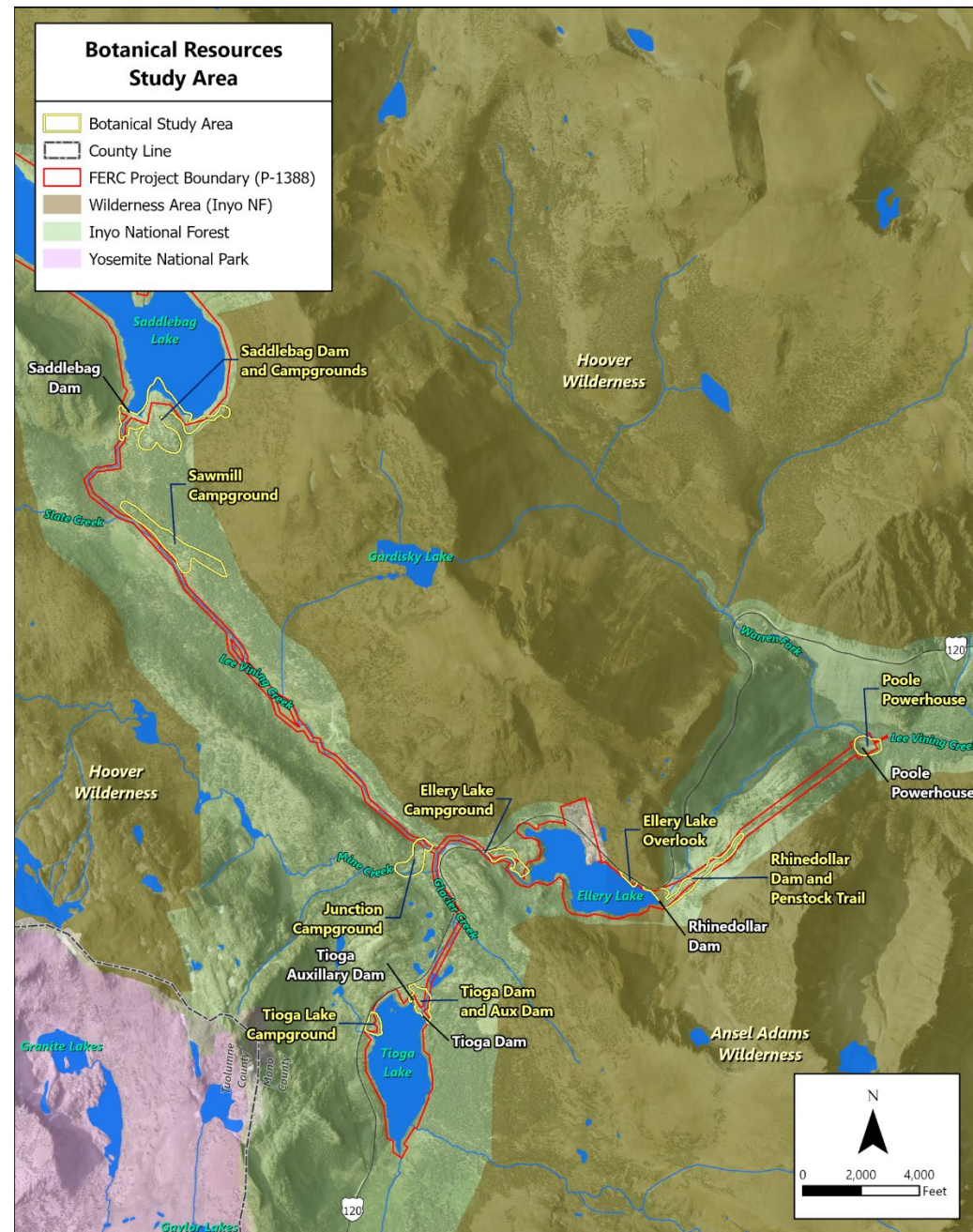
# Terrestrial, Botanical, Wetlands, and RTE Species Surveys

1. Botanical Resources (TERR-1)
2. Wildlife Resources (TERR-2)

# Botanical Resources (TERR-1)

Study Area Map for

- Special-status Plants
- Invasive Plant Species
- Vegetation Map





# Botanical Resources (TERR-1)

## Goals/Objectives

- Ground-truth existing U.S. Forest Service vegetation map (USFS 2019), including identification of any sensitive natural communities
- Document the presence of species listed by the federal and/or state Endangered Species Acts or proposed for listing, e.g., whitebark pine (*Pinus albicaulis*)
- Document the presence of other special-status plants
- Document non-native, invasive plants
- Incorporate results of the riparian monitoring study undertaken as part of the existing license
- Perform a focused study of selected riparian habitat areas using NDVI

# Botanical Resources (TERR-1)

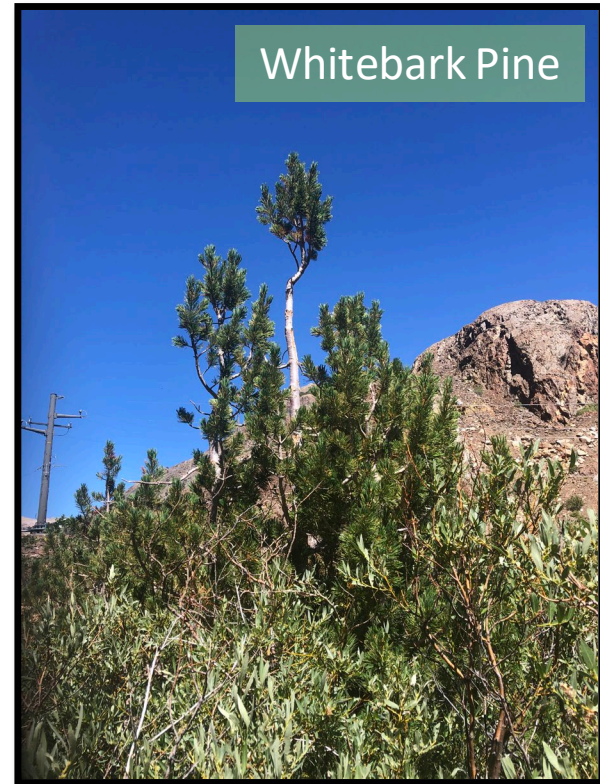
## Modifications to Methods

- Study sites for NDVI analysis were increased from 2 to 8
- Some study areas were extended beyond the 100-foot buffer
- Some study areas were decreased within the 100-foot buffer
- In place of reference population checks, two rounds of surveys were performed in 2022 to ensure coverage of the blooming periods for all species

# Botanical Resources (TERR-1)

## Preliminary Data

- Federally Listed plant species
  - Whitebark pine
- Special-status plant species
  - Mountain bent grass
  - Black cottonwood
- Invasive plant species
  - Cheat grass
- NDVI analysis



# Botanical Resources (TERR-1)

## Preliminary Data – Special-status Plant Species

Species	Status	Number of Individuals	Locations Observed
<i>Listed Under Federal Endangered Species Act</i>			
Whitebark Pine	Federally Threatened	1,004	Rhinedollar Dam and Penstock Trail, Saddlebag Dam and Campgrounds, Ellery Lake Campground, Sawmill Campground, Tioga Dam and Auxiliary Dam, and Tioga Lake Campground
<i>Other Special-status Species</i>			
Mountain Bent Grass	CRPR 2B.3	854	Saddlebag Dam and Campgrounds
Black Cottonwood	Local Concern (Agency Request)	9	Poole Powerhouse

# Botanical Resources (TERR-1)

## Preliminary Data – Invasive Plant Species

<b>Species</b>	<b>Number of Individuals</b>	<b>Locations Observed</b>
Cheat Grass	130	Poole Powerhouse and Ellery Lake Campground

# Botanical Resources (TERR-1)

## Study Area Map for Normalized Difference Vegetation Index (NDVI) Analysis


Study Sites  
□ Control  
□ Test



# Botanical Resources (TERR-1)

## Example of NDVI Study Site – Lower Lee Vining

Sampling Plots  
(10 square meters)

 Willow Riparian  
Scrub

 Wet Meadow



# Botanical Resources (TERR-1)

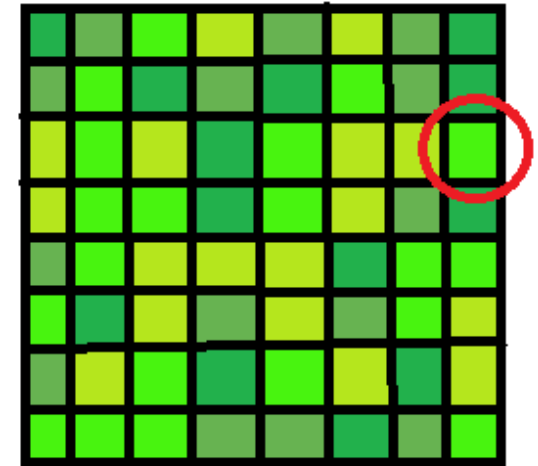
## Preliminary Data – NDVI

Normalized Difference Vegetation Index (NDVI)

- Quantifies vegetation by measuring the difference between near-infrared (NIR), which vegetation strongly reflects, and red light (R), which vegetation absorbs
- Provides the “greenness” of vegetation, used as a proxy for vegetation health

$$\text{NDVI} = (\text{NIR} - \text{R}) / (\text{NIR} + \text{R})$$

- Each willow riparian scrub or wet meadow study site had 10 sampling plots, each 10 square meters in size
- Used GIS to determine the NDVI value for each pixel within a sampling plot (aerial resolution was 12 cm in 2021 and 15 cm in 2016; e.g., Meadow Site 1 Above Saddlebag had approximately 96,476 pixels)
- Calculated mean NIR and R values for each sampling plot and used that to calculate the mean NDVI value for each sampling plot and study site



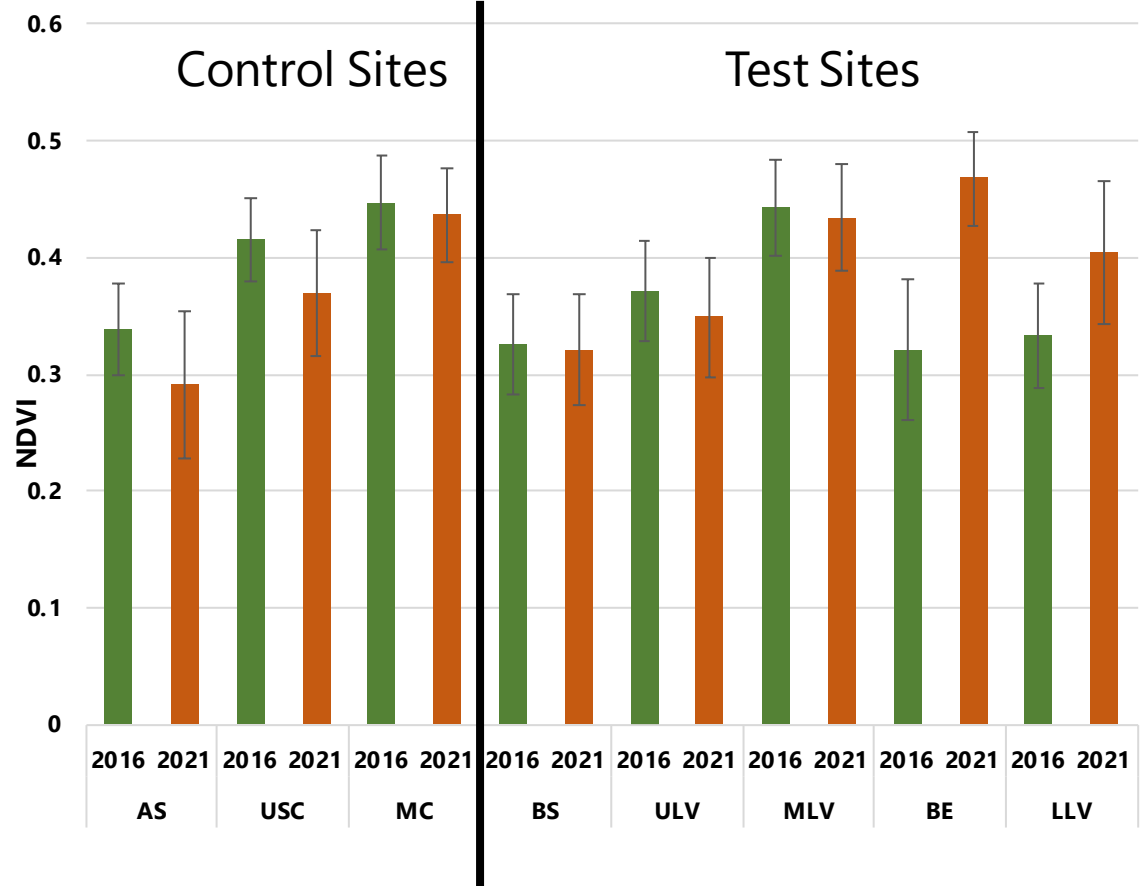


# Botanical Resources (TERR-1)

## Preliminary Data – NDVI Analysis

Mean NDVI +/- Standard Deviation for Willow Riparian Scrub

Control Sites	AS – Above Saddlebag
	USC – Upper Slate Creek
	MC – Mine Creek
Test Sites	BS – Below Saddlebag
	ULV – Upper Lee Vining
	MLV – Middle Lee Vining
	BE – Below Ellery
	LLV – Lower Lee Vining

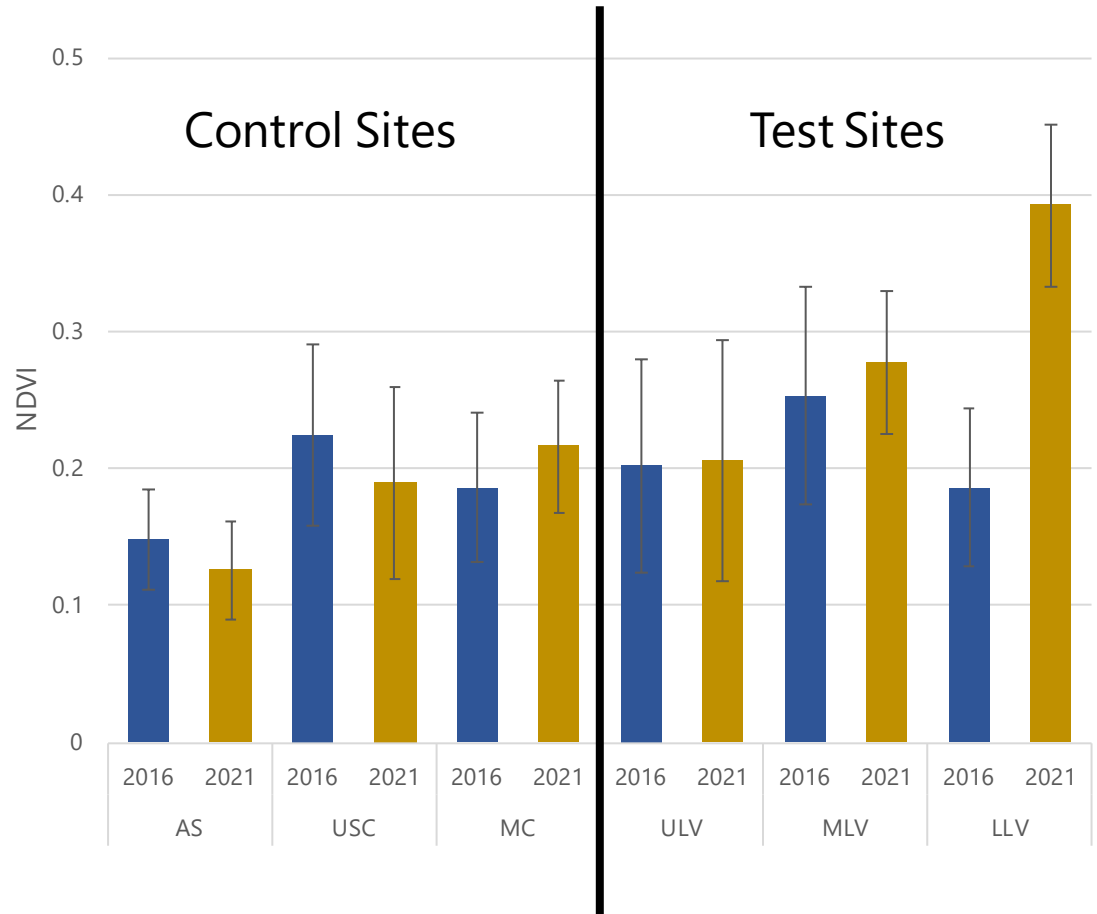


# Botanical Resources (TERR-1)

## Preliminary Data – NDVI Analysis

Mean NDVI +/- Standard Deviation for Wet Meadow Habitat

Control Sites	AS – Above Saddlebag
	USC – Upper Slate Creek
	MC – Mine Creek
Test Sites	ULV – Upper Lee Vining
	MLV – Middle Lee Vining
	LLV – Lower Lee Vining



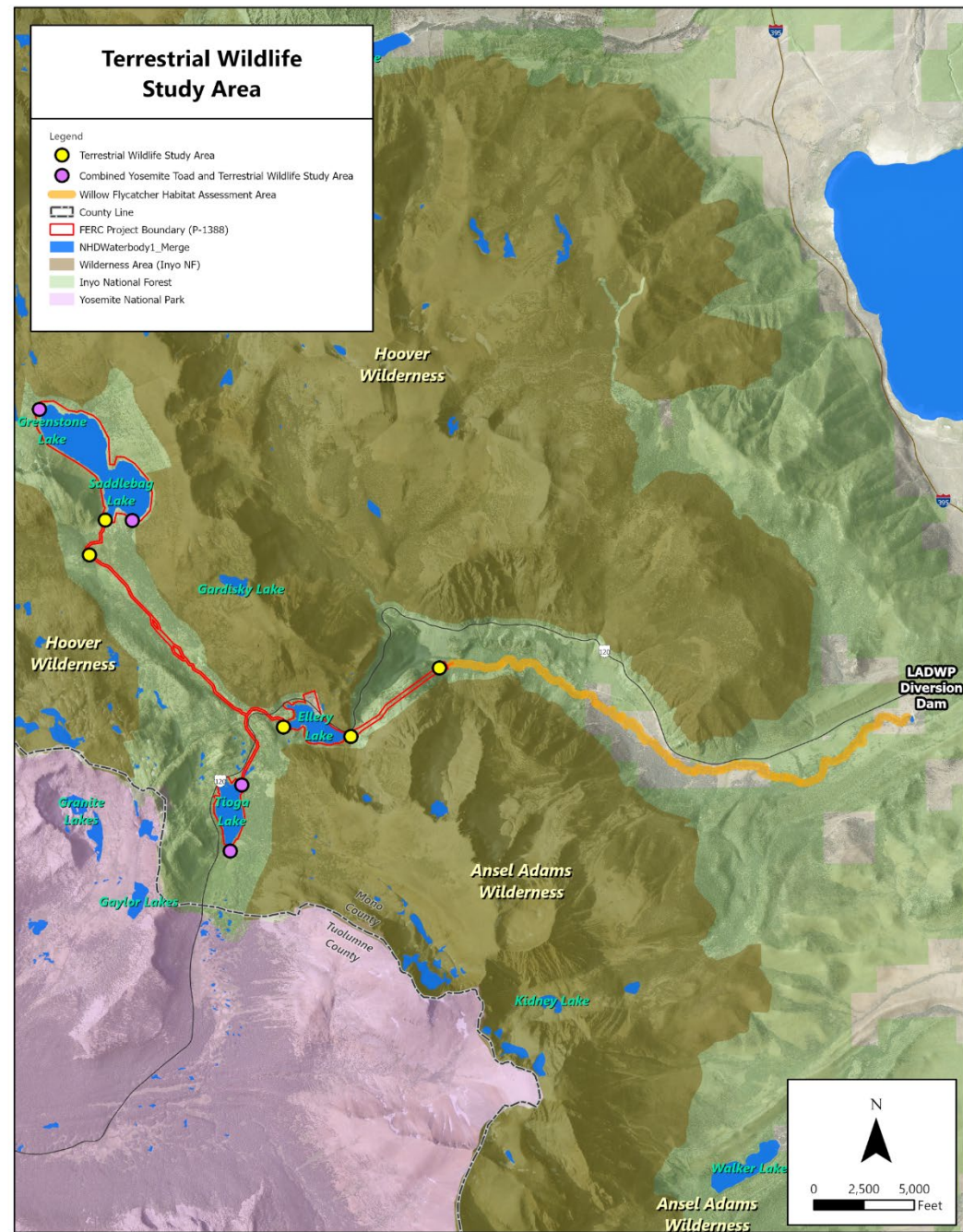
# Botanical Resources (TERR-1)

## Next Steps

- 2023 surveys to document any additional special-status plant and/or invasive species populations and to add new observations to the plant compendium

# Wildlife Resources (TERR-2)

## Terrestrial Wildlife Study Area Map



# Wildlife Resources (TERR-2)

## Goals/Objectives

- Build a compendium of wildlife species occurring within the Project areas
- Identify rare, threatened, and endangered riparian birds in the area during general wildlife surveys
- Determine persistence of known Yosemite toad (*Anaxyrus canorus*) populations within the Project Area and identify active breeding locations
- Determine interactions between dispersed recreational use and breeding habitat for Yosemite toad
- Develop sufficient data for informal and formal consultation needs for U.S. Fish and Wildlife Service with respect to the Yosemite toad
- Assess willow flycatcher (*Empidonax traillii*) nesting habitat downstream of the Project between Poole Powerhouse and the reservoir at the LADWP Diversion Dam

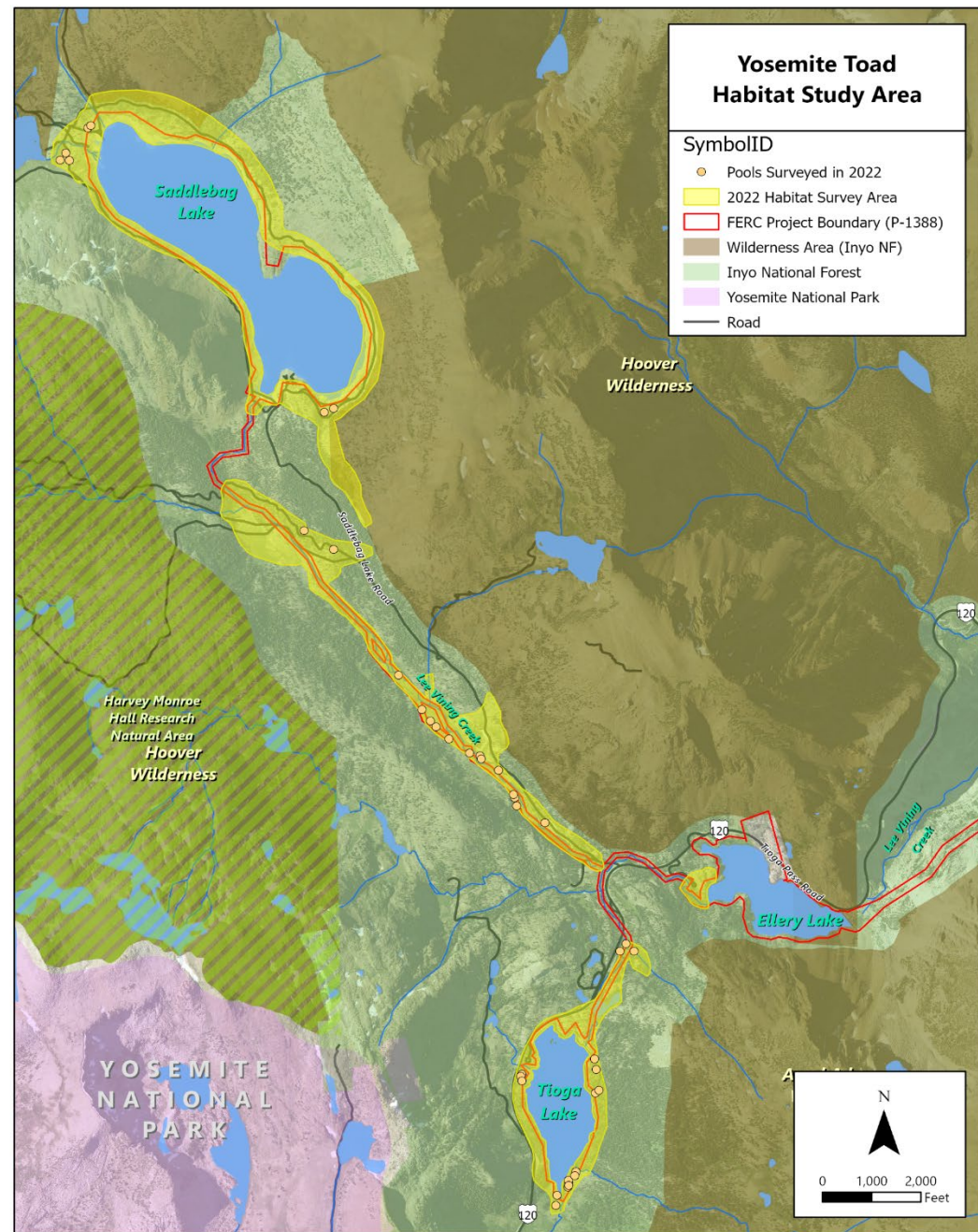
# Wildlife Resources (TERR-2)

## Modifications to Methods

- Expanded survey efforts for Yosemite toad and toad habitat were expanded in consultation with California Department of Fish and Wildlife (e.g., pools, meadows in upper floodplain of Lee Vining Creek, meadow south of Saddlebag Lake, and along Lee Vining Creek between reservoirs)
- Added an additional field visit (five visits were conducted instead of four)
- Deployment of the two cameras were limited to months where the cameras would not be buried in snow

# Wildlife Resources (TERR-2)

## Yosemite Toad Habitat Study Area Map



# Wildlife Resources (TERR-2)

## Preliminary Data Summary

- General wildlife
- Yosemite toad
- Willow flycatcher habitat





# Wildlife Resources (TERR-2)



## General Wildlife Preliminary Data Summary

- Observed 53 wildlife species during surveys or through review of wildlife cameras
- Of the 53 species, 7 were special status (Endangered, Threatened, Fully Protected, or State Species of Special Concern)
  - Yosemite toad, snowshoe hare, white-tailed jackrabbit, olive-sided flycatcher, bald and golden eagle, and peregrine falcon
- No rare, threatened, or endangered riparian bird species (including willow flycatcher) were observed

# Wildlife Resources (TERR-2)



Adult Yosemite toad in amplexus at known breeding pool south of Saddlebag Lake (2022).

## Yosemite Toad Preliminary Data Summary

- Eggs, tadpoles, subadult, and adult Yosemite toad observed at known breeding pool south of Saddlebag Lake
- Study area expanded to include potential breeding habitat adjacent to FERC boundary, such as along portions of Lee Vining Creek downstream of Saddlebag
- Unidentified tadpoles observed in pool adjacent to Lee Vining Creek; pool dried up before identification could be made
- Multiple adult mountain garter snakes (known amphibian predator) observed along Lee Vining Creek

# Wildlife Resources (TERR-2)



Riparian vegetation between Aspen Campground and Lower Lee Vining Creek Campground (2022).



Riparian vegetation between Aspen Campground and Lower Lee Vining Creek Campground (2022).

## Willow Flycatcher Habitat Data Summary

- Reach between Aspen Campground and Lower Lee Vining Campground supports potentially suitable nesting habitat
- Closest record of nesting approximately 4 miles south in Pumice Valley

# Wildlife Resources (TERR-2)

## Next Steps



- Update compendium with 2023 field survey observations for the Final Technical Report
- Continue visual encounter surveys focused on Yosemite toad in 2023; conduct more detailed mapping of potential breeding habitat within the expanded Yosemite toad study area
- Coordinating with Project Team Rec specialist to survey dispersed rec use at known Yosemite toad breeding site
- The willow flycatcher habitat assessment survey effort is complete, and no additional surveys are anticipated

# Questions?

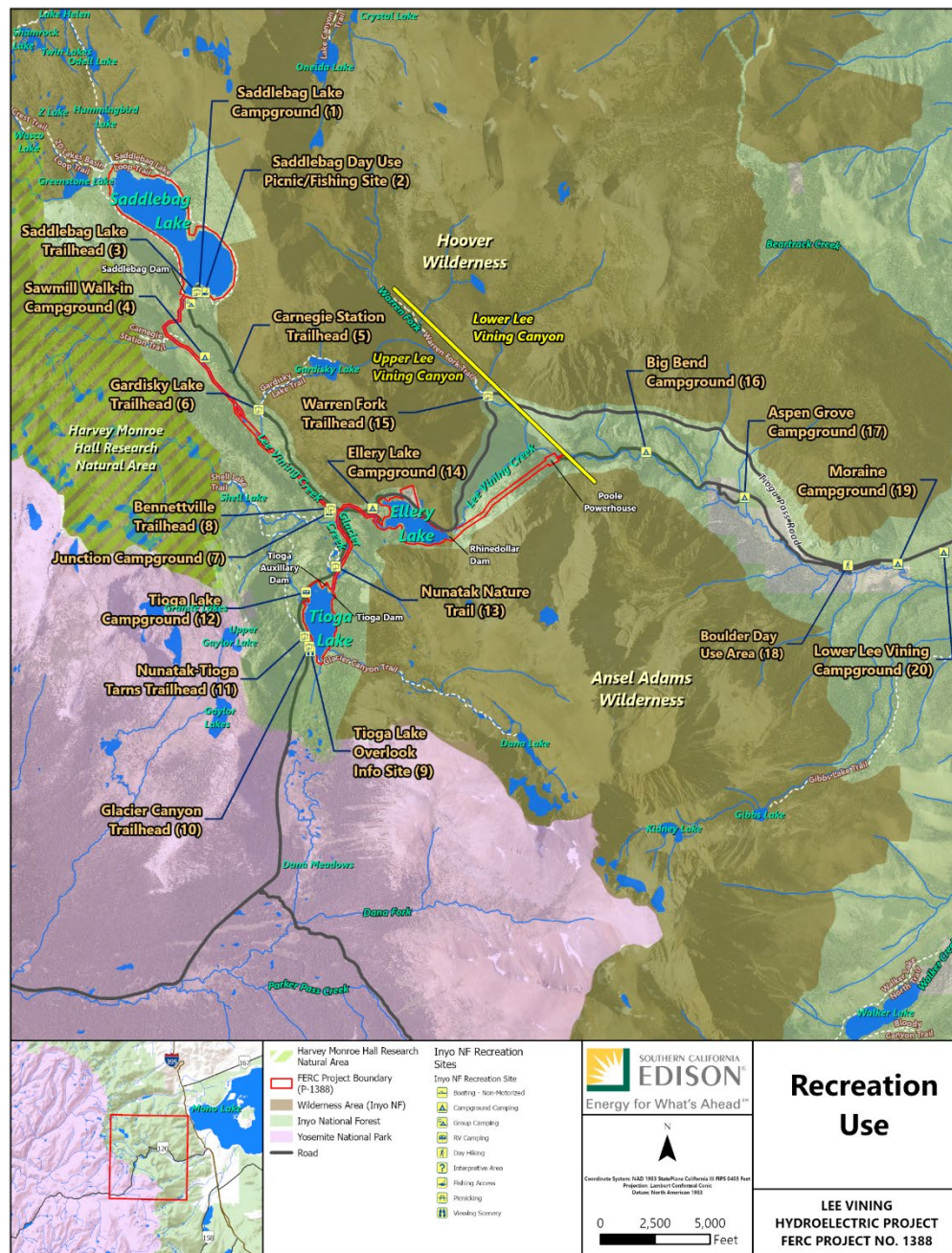


# 10-Minute Break



# Recreation Use and Needs Assessment (REC-1)

## Study Area Map



# Recreation Use and Needs Assessment (REC-1)

## Goals/Objectives

- Characterize existing recreation:
  - Opportunities
  - Visitation
  - Visitor characteristics
  - Needs
  - Preferences
- Estimate current recreational fishing in Project creeks and reservoirs
- Estimate future recreational demand and needs
- Assess consistency of current recreation opportunities with the Desired Conditions, Goals, Standards, and Guidelines in the Land Management Plan for the Inyo National Forest (USFS, 2019)



# Recreation Use and Needs Assessment (REC-1)

## Modifications to Methods

- Survey dates were shifted due to campground and road opening dates early in the recreation season
- An unrelated field staff injury resulted in moving one survey day from July into September
- Surveys were conducted only in English rather than English and Spanish as originally proposed
- Cattleguard Campground consists of an administrative building and is not open to public use and therefore was not surveyed

# Recreation Use and Needs Assessment (REC-1)

Location of Survey (Site ID)	Surveys Accepted	Surveys Declined	Total Surveys
Saddlebag Lake Rec Areas (1, 2, 3)	50	9	59
Sawmill Walk-in Campground (4)	20	2	22
Carnegie Station Trailhead (5)	5	1	6
Gardisky Lake Trailhead (6)	8	3	11
Junction Campground, Bennettville Trailhead (7, 8)	42	10	52
Tioga Lake Overlook Info Site, Glacier Canyon Trailhead (9, 10)	31	11	42
Nunatak-Tioga Tarns Trailhead (11)	1	0	1
Tioga Lake Campground (12)	22	9	31
Nunatak Nature Trail (13)	5	1	6
Ellery Lake Campground (14)	19	4	23
Warren Fork Trailhead (15)	1	1	2
Big Bend Campground (16)	27	8	35
Aspen Grove Campground (17)	38	8	46
Boulder Day Use Area (18)	1	0	1
Moraine Campground (19)	24	4	28
Lower Lee Vining Campground (20)	36	11	47
<b>Totals</b>	<b>330</b>	<b>82</b>	<b>412</b>

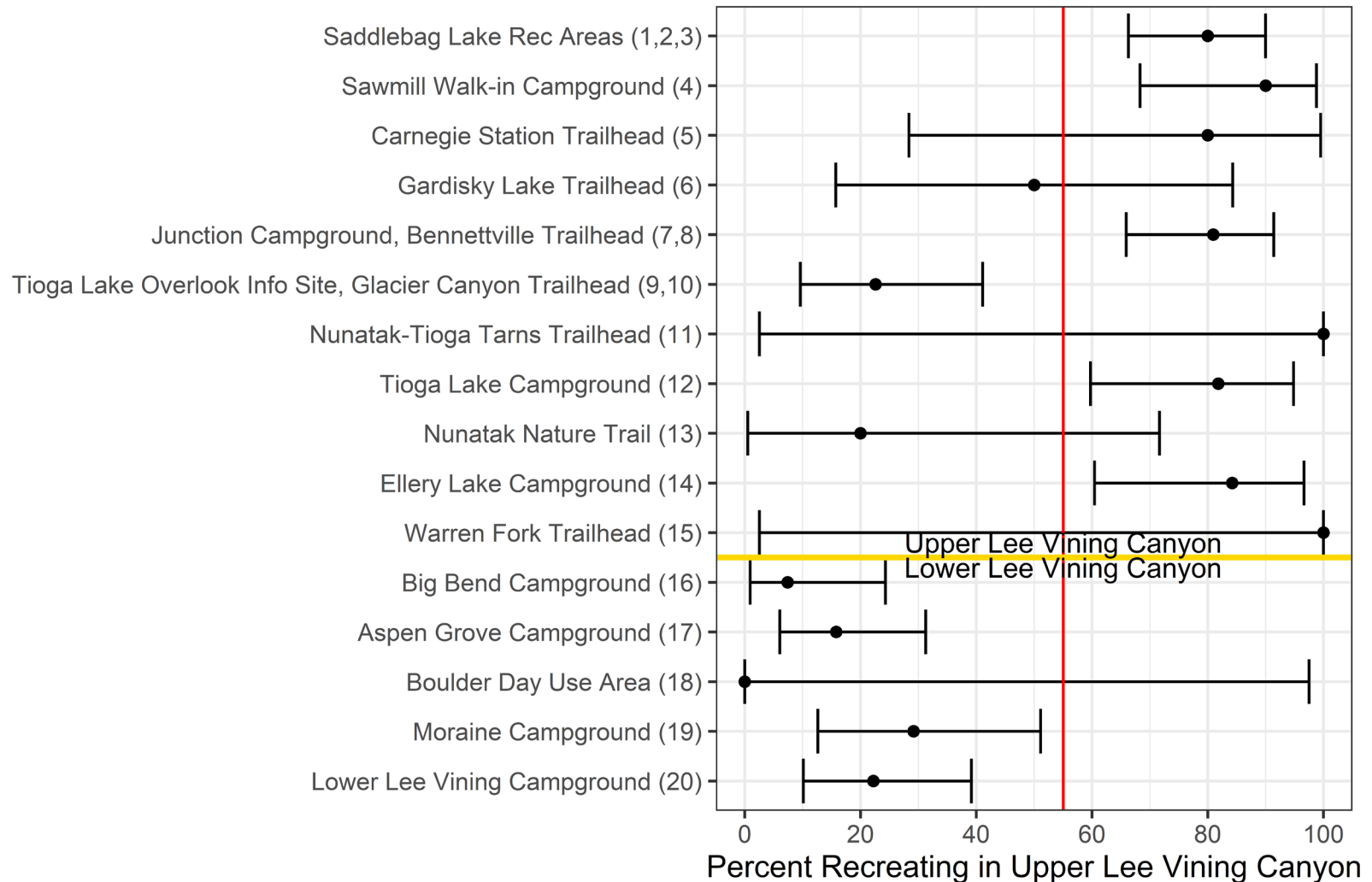
# Recreation Use and Needs Assessment (REC-1)

Location of Survey (Site ID)	Main Survey Question Response							
	Passing through on my way to Yosemite National Park	Passing through on my way to Eastern Sierras (Mono Lake, June Lake, Mammoth Lakes, Bishop, etc.)	Recreate in the Upper Lee Vining Canyon (Saddlebag Lake, Lee Vining Creek, Tioga Lake, Glacier Creek, Ellery Lake, etc.)	Recreate in the Lower Lee Vining Canyon (Campgrounds and Lee Vining Creek access below Poole Powerhouse)	Other	User Surveys (2023)	Spot Counts (2023)	Counters (2023)
<b>Upper Lee Vining Canyon</b>								
Saddlebag Lake Rec Areas (1, 2, 3)	7	3	40	0	0	Yes	Yes	Yes
Sawmill Walk-in Campground (4)	2	0	18	0	0	Yes	Yes	Yes
Carnegie Station Trailhead (5)	0	1	4	0	0	No	No	No
Gardisky Lake Trailhead (6)	1	2	4	0	1 – Locals from Mono fire and forest service hiking Gardisky	No	No	No
Junction Campground, Bennettville Trailhead (7, 8)	7	1	34	0	0	Yes	Yes	Yes
Tioga Lake Overlook Info Site, Glacier Canyon Trailhead (9, 10)	11	11	7	1	1 – Motorcycle ride	Yes	Yes	No
Nunatak-Tioga Tams Trailhead (11)	0	0	1	0	0	No	No	No
Tioga Lake Campground (12)	3	1	18	0	0	Yes	Yes	Yes
Nunatak Nature Trail (13)	4	0	1	0	0	No	No	No
Ellery Lake Campground (14)	3	0	16	0	0	Yes	Yes	Yes
Warren Fork Trailhead (15)	0	0	1	0	0	No	No	No
<b>Lower Lee Vining Canyon</b>								
Big Bend Campground (16)	0	2	2	22	1 – Going to Bridgeport area	No	No	No
Aspen Grove Campground (17)	4	0	6	28	0	No	No	No
Boulder Day Use Area (18)	0	0	0	1	0	No	No	No
Moraine Campground (19)	3	0	7	14	0	No	No	No
Lower Lee Vining Campground (20)	1	1	8	24	2 – Driving through to Orange County Passing through to Washington	No	No	No
<b>Totals</b>	<b>46</b>	<b>22</b>	<b>167</b>	<b>90</b>	<b>5</b>			

# Recreation Use and Needs Assessment (REC-1)

Location (Site ID)	Number of Visitors Encountered	Number of Surveys Accepted	Number Recreating in Upper Lee Vining Canyon	Percent Recreating in Upper Lee Vining Canyon	Lower 95% CL	Upper 95% CL
<b>Upper Lee Vining Canyon</b>						
Saddlebag Lake Rec Areas (1,2,3)	59	50	40	80%	66%	90%
Sawmill Walk-in Campground (4)	22	20	18	90%	68%	99%
Carnegie Station Trailhead (5)	6	5	4	80%	28%	99%
Gardisky Lake Trailhead (6)	11	8	4	50%	16%	84%
Junction Campground Bennettville Trailhead (7, 8)	52	42	34	81%	66%	91%
Tioga Lake Overlook Info Site, Glacier Canyon Trailhead (9, 10)	42	31	7	23%	10%	41%
Nunatak-Tioga Tarns Trailhead (11)	1	1	1	100%	2.5%	100%
Tioga Lake Campground (12)	31	22	18	82%	60%	95%
Nunatak Nature Trail (13)	6	5	1	20%	0.5%	72%
Ellery Lake Campground (14)	23	19	16	84%	60%	97%
Warren Fork Trailhead (15)	2	1	1	100%	2.5%	100%
<b>Lower Lee Vining Canyon</b>						
Big Bend Campground (16)	35	27	2	7%	0.9%	24%
Aspen Grove Campground (17)	46	38	6	16%	6.0%	31%
Boulder Day Use Area (18)	1	1	0	0%	0%	98%
Moraine Campground (19)	28	24	7	29%	13%	51%
Lower Lee Vining Campground (20)	47	36	8	22%	10%	39%

# Recreation Use and Needs Assessment (REC-1)



# Recreation Use and Needs Assessment (REC-1)

## Next Steps

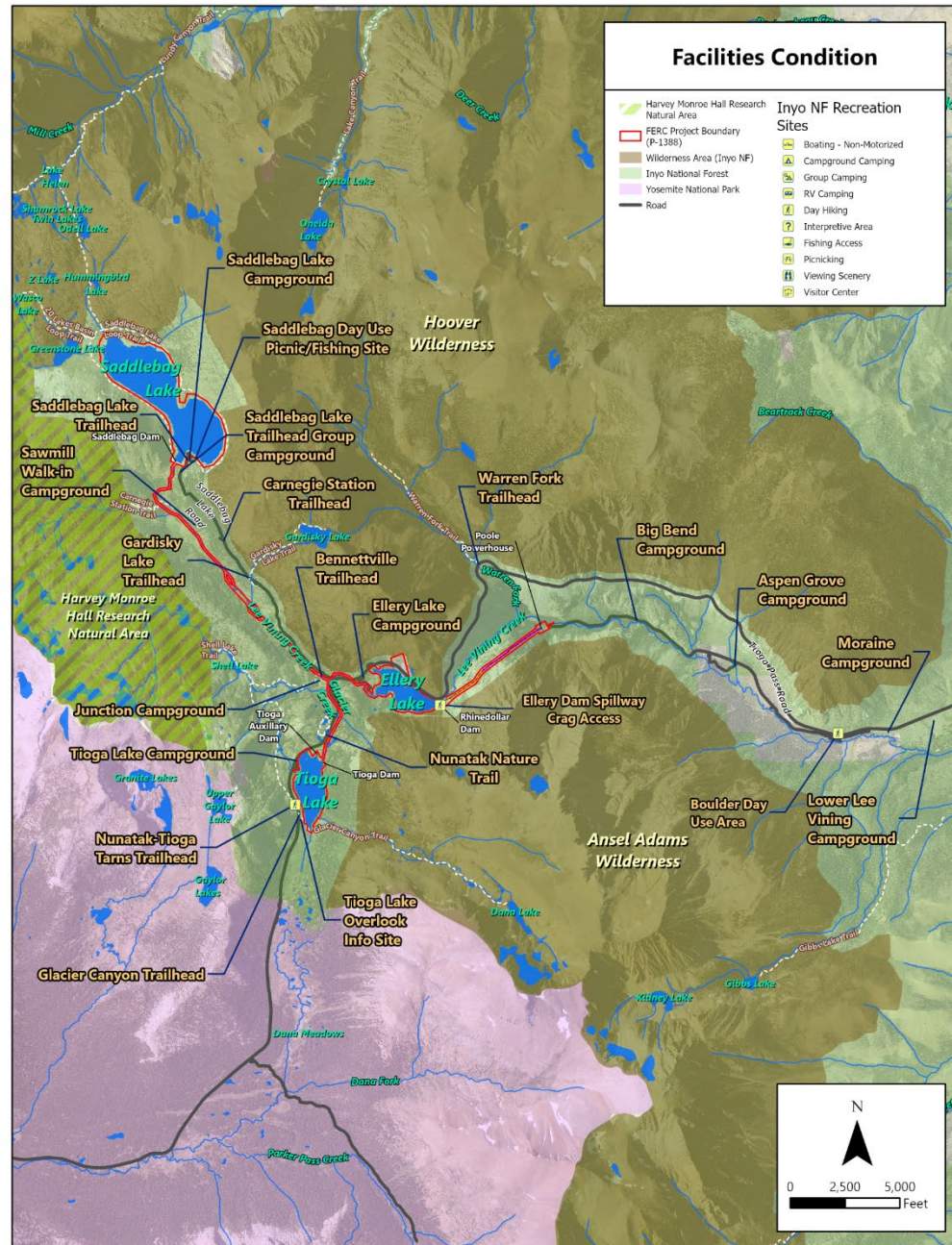
- March 1 TWG meeting
- Additional data will be collected for Study REC-1 in 2023
- SCE will work with the Recreation and Land Use TWG to finalize survey forms prior to the 2023 field season.
- 2023 Study elements:
  - Winter and summer survey locations and schedule
  - 2023 survey/interview forms
  - Spot count schedule
  - Traffic and trail counter numbers and locations
  - Creel survey dates, schedule, and forms

Questions?



# Existing Recreation Facilities Condition Assessment (REC-2)

Study Area Map





# Recreation Facilities Condition Assessment (REC-2)

## Goals/Objectives

- Identify existing dispersed or informal use areas, including documentation of existing conditions (2022 Study Season)
- Conduct a facility inventory and condition assessment at existing recreation facilities and associated parking areas, including an evaluation of signage and public safety features (2023 Study Season)
- Assess the carrying capacity and potential need for expansion, or alteration of existing recreation facilities (2023 Study Season)
- Assess the condition and potential for universal accessibility, where feasible (2023 Study Season)
- Assess the consistency of current facilities with the Desired Conditions, Goals, Standards, and Guidelines described in the Land Management Plan for the Inyo National Forest (USFS 2019) (2023 Study Season)

# Recreation Facilities Condition Assessment (REC-2)

## Dispersed Use Observations Aerial Imagery Assessment

Site	Boating	Pull Out	Trailhead	Other	Site Total
Ellery	--	4	2	--	6
Saddlebag	1	--	--	1	2
Tioga	1	2	---	--	3
<b>Type Total</b>	2	6	2	1	11

## Dispersed Use Observation Points, In-field Observation

Site	Boating	Pull Out	Trailhead	Campsite	Fire Pit	Site Total
Ellery	--	7	2	--	3	12
Saddlebag	1	--	--	--	--	1
Tioga	1	5	--	2	3	11
<b>Type Total</b>	2	12	2	2	6	24

## Total Length of Social Trails (feet)

Site	Aerial Imagery Assessment	In-field Observation
Ellery	6,140.5	8,930.1
Rhinedollar	3,607.1	3,607.1
Saddlebag	4,308.0	7,047.5
Tioga	1,817.3	9,923.6
<b>Grand Total</b>	15,872.9	29,508.3

# Recreation Facilities Condition Assessment (REC-2)

## Next Steps

- March 1 TWG meeting
- Conduct facilities condition assessments
- Findings from this study will be used to inform potential locations for additional user interviews, spot counts, or traffic/trail counters in REC-1 activities to be performed during the 2023 field season

# Questions?



# RELICENSING SCHEDULE OVERVIEW

# Relicensing Process Schedule

Date	Activity
January/February 2023	2022 Progress Report meeting
Spring – Fall 2023	2023 field studies
Spring 2023	Select Technical Reports <ul style="list-style-type: none"> <li>• Stream and Reservoir Water Quality Study (WQ-1)</li> <li>• Reservoir Fish Population Study (AQ-1)</li> <li>• Stream Fish Populations Study (AQ-2)</li> <li>• General Botanical Resources Survey (TERR-1)</li> </ul>
Fall 2023	<ul style="list-style-type: none"> <li>• Operations and Hydrology Model (AQ-5)</li> </ul>
Spring 2024	Remaining Technical Reports <ul style="list-style-type: none"> <li>• Aquatic Habitat Mapping and Sediment Characterization (AQ-3)</li> <li>• Aquatic Invasive Plants Survey (AQ-4)</li> <li>• Lower Lee Vining Creek Channel Morphology (AQ-6)</li> <li>• General Wildlife Resources Survey (TERR-2)</li> <li>• Project Lands and Roads Assessment (LAND-1)</li> <li>• Visual Resource Assessment (LAND-2)</li> <li>• Recreation Use Assessment (REC-1)</li> <li>• Facilities Condition Assessment (REC-2)</li> <li>• Cultural Resources (CUL-1)</li> <li>• Tribal Resources (TR-1)</li> </ul>
September 2024	SCE Files Draft License Application
January 2025	SCE Files Final License Application

# How to Stay Involved

- Check the Project website for updates/news at [www.sce.com/leevining](http://www.sce.com/leevining)
- You can view other SCE relicensing Projects at [www.sce.com/regulatory/hydro-licensing](http://www.sce.com/regulatory/hydro-licensing)
- Sign up to receive Project-related emails through the Contact Registration Form/Project Questionnaire on the Project website
- Sign up for FERC's for e-subscription (docket number "P-1388") at [www.ferc.gov](http://www.ferc.gov)
- Email Carissa Shoemaker with questions [carissa.shoemaker@erm.com](mailto:carissa.shoemaker@erm.com)

# Final Questions?





Thank you!