

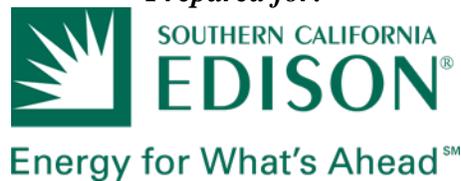
Version 1.0
Plan Issued on July 26, 2018
Comments Due on August 31, 2018

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FISH DISTRIBUTION BASELINE STUDY PLAN

BISHOP CREEK HYDROELECTRIC PROJECT (FERC PROJECT NO. 1394)

Prepared for:



Bishop, California

Prepared by:

Kleinschmidt

Portland, Oregon
www.KleinschmidtGroup.com

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SOUTHERN CALIFORNIA EDISON

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FISH DISTRIBUTION BASELINE STUDY PLAN

BISHOP CREEK HYDROELECTRIC PROJECT (FERC No. 1394)

SOUTHERN CALIFORNIA EDISON

1.0 INTRODUCTION

Southern California Edison Company (SCE) is the licensee, owner and operator of the Bishop Creek Hydroelectric Project (Project) (Federal Energy Regulatory Commission [FERC] Project No. 1394). The Project is located on Bishop Creek in Inyo County, California, approximately 5 miles southwest of the city of Bishop (Figure 1-1). The licensee operates the Project under a 30-year license issued by FERC on July 19, 1994. As the current license is due to expire on June 30, 2024, SCE has initiated the formal relicensing process utilizing the Integrated Licensing Process (ILP) by filing the Notification of Intent (NOI) and Pre-Application Document (PAD) with FERC on XXXX.

In advance of filing the NOI and PAD, SCE worked with stakeholders to identify necessary studies, with the goal of accelerating FERC's ability to issue a Study Plan Determination. Efforts began over a year prior to the formal initiation of the process with FERC, through a series of Technical Working Group (TWG) meetings held in Bishop, California.

During these TWG meetings, stakeholders identified the need for a Baseline Fish Distribution Study. This study plan details SCE's proposal for study objectives, study area, methods, and schedule for the effort. Appendix A to this plan is a consultation summary of discussions specific to this plan, along with a table that summarizing stakeholders' comments on previously reviewed versions, and how SCE addressed those comments. If SCE does not incorporate a comment or request, SCE will provide rationale based on Project specific information and FERC ILP study plan criteria.

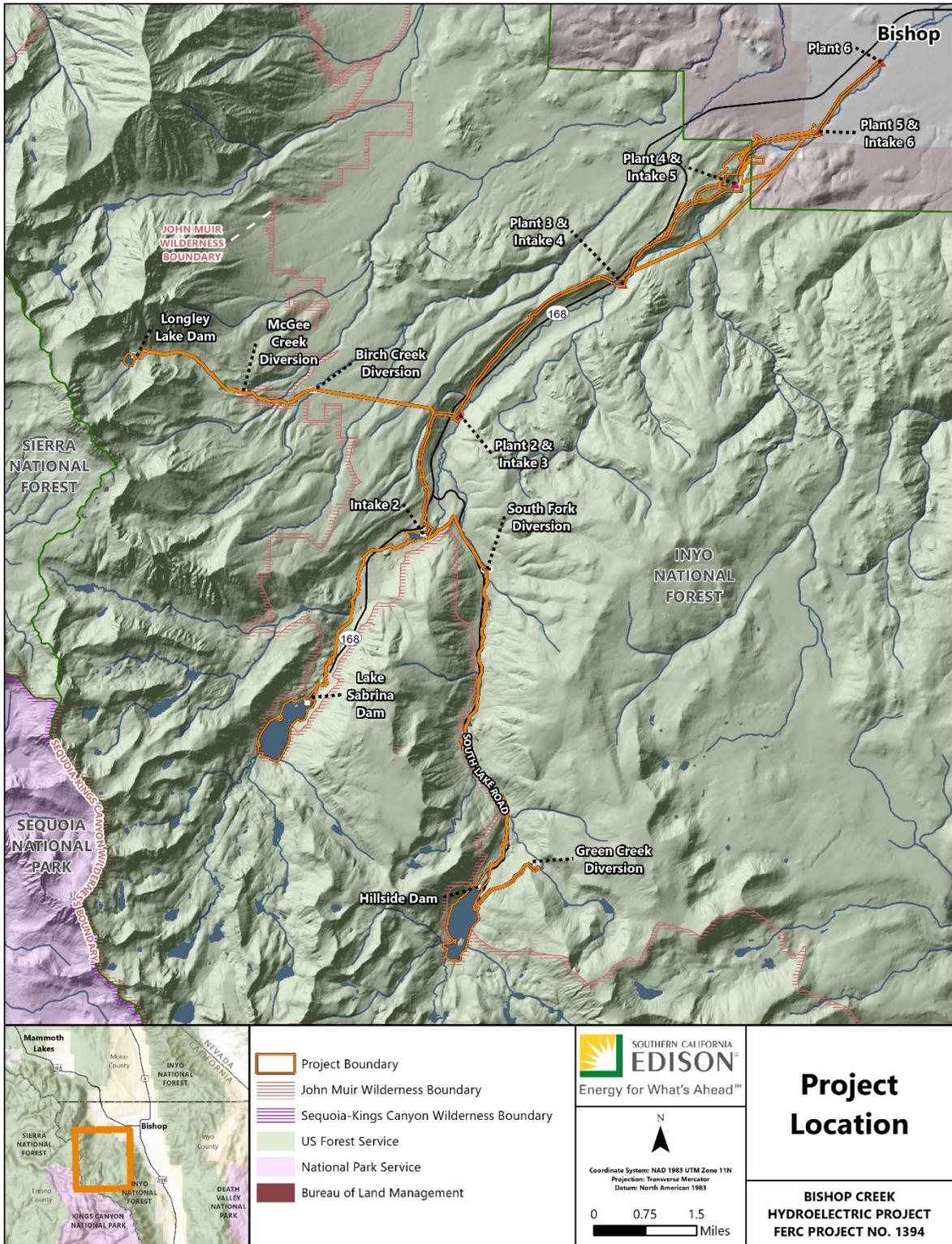


FIGURE 1-1 PROJECT LOCATION MAP

2.0 PROJECT NEXUS

Project operations may indirectly or directly influence fish resources occupying Project waters.

3.0 STUDY GOALS AND OBJECTIVES

Study goals and objectives are determined based on input received in consultation with stakeholders participating in the Aquatic Resources Technical Working Group (TWG) during the March 2018 through June 2018 timeframe, information reviewed from SCE files, and a Project area site visit during June 2018. The TWG stated that there is no current information regarding the distribution of both game and non-game fish species of management interest in the Project area; nor is there status regarding the growth and density of wild brown trout populations in the Project area.

Goal: Determine the distribution of fish species in Bishop Creek, South Lake and Lake Sabrina.

Objectives:

1. Characterize populations of Owens sucker in Lake Sabrina and South Lake.
2. Determine if recruitment of Owens sucker has occurred downstream from Lake Sabrina and South Lake in Bishop Creek.
3. Assess distribution of other fish species in Project waters.
4. Identify to what extent naturally reproducing brown trout populations are consistent with historic levels documented during the 1990s through 2010 at historic monitoring sites.

4.0 STUDY AREA

South Lake, Sabrina Lake and select Bishop Creek bypass reaches.

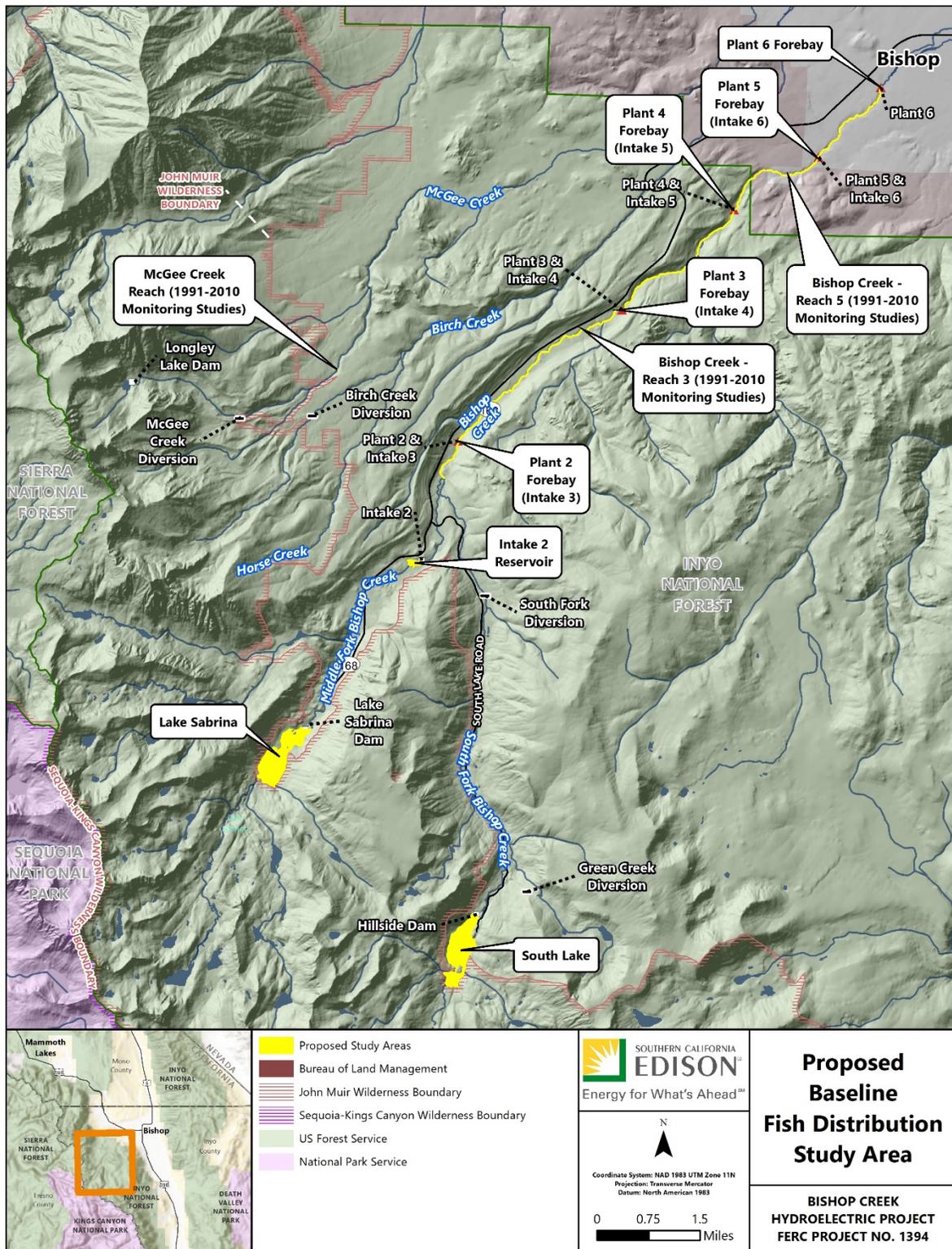


FIGURE 4-1 PROPOSED BASELINE FISH DISTRIBUTION STUDY AREA

5.0 METHODS

1. *Characterize populations of Owens sucker in Lake Sabrina and South Lake*

The Owens sucker (*Catostomus fumeiventris*) is native to the Owens River but has been introduced into other water bodies, including parts of Bishop Creek. California Department of Fish and Wildlife (CDFW) and U.S. Forest Service (USFS) biologist speculate that the species may have been introduced into South Lake and Lake Sabrina (March 2018 stakeholder meeting, *personal communication*). A small group of spawning adults was subsequently observed during the June 2018 site visit to Lake Sabrina. SCE proposes the following study methods to further document the presence of this species in both lakes.

a. *Review literature to determine habitat requirements and ecology of Owens sucker*

SCE will obtain and review applicable literature describing the life history, ecology and habitat requirements of the Owens sucker. This information will be used to inform and refine field sampling efforts and better understand the interaction between the species and study area waters.

b. *Conduct field survey*

Any potential populations of Owens sucker in the study area lakes are likely relatively small, and therefore individuals are likely scattered and difficult to detect using conventional sampling methods such as electrofishing or nets. However, adults normally aggregate in the springtime in spawning areas and may be readily observed, captured and enumerated during this period. Further evidence of spawning activities may confirm that such populations are potentially self-sustaining.

c. *Identify known or likely spawning areas*

Based on review of the literature (*Task A*) and geographic information system (GIS) mapping of the study area lakes, SCE will target likely spawning habitat and establish provisional monitoring stations. In general Owens suckers prefer spawning in shallows with flowing or well-aerated water, and therefore inlets, outlets and windswept shorelines will be prioritized. Such areas should be relatively finite, confined and readily accessible shoreline and shoal areas.

d. *Visit spawning areas during late spring spawning season*

Based on review of the literature (*Task A*), and habitat mapping, SCE will target a spring spawning season monitoring period, and conduct a methodical site visit to each monitoring station at least once per week during the spawning season.

i. *Observe spawning activity and estimate number of adults*

During each monitoring event, SCE will record the date and time, and use calibrated meters to measure *in situ* ambient temperature, dissolved oxygen, water clarity and climatic conditions (air temperature, wind speed and cloud cover/precipitation). SCE will estimate the number of Owens suckers, if any, observed spawning at each monitoring location. If none are directly observed, SCE will search for evidence of spawning such as redd formations or spent adult fish and enumerate such findings.

ii. *Sample adults for length, weight and age data*

To the extent possible, SCE will collect a representative subsample of adults to document basic biometric information, such as length (total length [TL] or fork length [FL]), weight, gender and spawning condition. Scale samples will be obtained from each adult and made available to CDFW for age determination if desired. The method of collection will be determined in consultation with CDFW but is anticipated to include non-lethal methods such as electrofishing or trap netting. To minimize disturbance to spawning, no more than 30 individual adults will be sampled and handled. All specimens will be returned alive to the source water immediately following processing.

2. *Document if recruitment of Owens sucker has occurred downstream from Lake Sabrina and South Lake in Bishop Creek (field effort combined with Objective 3 below)*

The extent to which downstream escapement of Owens sucker from Lake Sabrina (or South Lake if suckers exist there) occurs is unknown. SCE proposes the following study methods to document the presence of this species in other Project areas downstream from these lakes.

a. *Locate and geo-reference sampling areas in appropriate habitat between the lakes and Plant 2*

In general, Owens sucker species are detritivores that prefer pools and runs with sediments and fine substrates. Based on review of the literature (*Task I-A*) SCE will target likely habitat for further sampling. SCE assumes that natural pools and forebays would be the focus of this investigation.

- b. *Sample for fish using backpack electrofishing in wadable areas and gillnets or trap nets in deeper un-wadable areas*

Sampling will be included as a component of the overall fishery survey outlined below in Objective 3.

- c. *Collect length, weight and age data for any suckers collected*

SCE will document basic biometric information, such as numeric abundance, length (TL or FL) and weight. Scale samples will be obtained from each adult and made available to CDFW for age determination if desired.

- d. *Collect collateral water quality data*

During each sampling event, SCE will use calibrated meters to measure *in situ* ambient temperature, dissolved oxygen, pH and conductivity water clarity.

- e. *Sampling season anticipated as late summer or early fall*

SCE will conduct a one-time survey. To the extent possible, sampling will be scheduled to occur in late summer or early fall. This will allow any young of year (YOY) specimens to grow to a detectable size and occur prior to the fall trout spawning period.

3. *What is the distribution of other fish species in Project waters?*

No recent surveys have documented the general abundance and distribution of fish species in the Project area.

- a. *Combine effort with Objective 2 survey*

Each sampling site will be georeferenced. In addition to stations identified under Objective 2, at least one additional station will be located in fluvial habitat below selected forebay diversion dams, subject to access and safety considerations, and include historic long-term monitoring sites employed by Sada (2010). Each site will be selected based on habitat characteristics in consultation with CDFW and USFS. SCE will conduct a one-time survey and to the extent possible, sampling will be scheduled to occur in late summer or early fall. This will allow any YOY specimens to grow to a detectable size and occur prior to the fall trout spawning period. Sampling will be conducted in wadable areas using backpack electrofishing techniques. Trap nets and/or gill nets will be deployed in any unwadable sampling areas such as forebay pools. Station selection and sampling effort (*i.e.* stream length and duration of net sets) will be determined in consultation with CDFW and USFS. In addition to data to be collected as described under Objective 2, SCE will also gather the following biological data:

- length and weight data for brook trout and rainbow trout.
- length, weight and scale samples for brown trout.

- enumerate any other species encountered (*voucher specimen(s) for species not previously reported*).
4. *To what extent are naturally reproducing brown trout populations consistent with levels documented during the 1990s through 2010 at historic monitoring sites?*

Brown trout are an introduced game species with a self-sustaining population in the lower portion of the Project area. SCE monitored this population periodically following implementation of habitat-based instream flow, through 2010. Sada (2010) summarized the findings and reported that common population metrics (*i.e.*, density, growth, age) were comparable to other regional streams with similar habitat throughout most of this period. However, the 2009 data indicated that density had declined, although growth and age remained about the same as before. It is not known if this decline reflected a causal trend, an aberration, or natural variability. SCE proposes to obtain an additional time series reference point by sampling the historic reference sites and replicating past monitoring studies described by Sada (2010).

SCE proposes the following steps to the study for this objective:

- 1 Re-measure habitat parameters to determine if sites are still comparable to historic conditions.
- 2 Replicate sampling methods, data collection and analysis performed by Sada (2010).
- 3 Analyze identical metrics to Sada (2010).
- 4 Statistical analysis to determine:
 - a. degree of similarity/dissimilarity to past data sets.
 - b. the extent of any variability in the data.

6.0 SCHEDULE AND REPORTING

Following FERC's anticipated study plan determination in early 2020, it is anticipated to implement the first field season in 2020. FERC's ILP requires an initial study report 1 year following the determination. This provides opportunities to review results and as necessary adjust scope and methods.

7.0 REFERENCES

Sada, D.W. and C. Rosamond. 2010. 2009 and 2010 fish population surveys Bishop and McGee Creeks, Inyo County, California. Submitted to Southern California Edison, Rosemead, CA. 26 pp.

APPENDIX A: Study Plan Consultation Record

Appendix A

Study Plan Consultation Record

This study plan has been developed in consultation with the Bishop Creek Aquatic Resources Technical Working Group (TWG). The intent of the consultation process is to achieve consensus, to the degree possible, on the need for specific studies, the key resource questions to be addressed by the studies, and the appropriate methodology and level of effort for the study.

This appendix summarizes the key consultation milestones for each study plan (Table 1), and how Southern California Edison Company (SCE) has addressed comments received through the consultation process. Table 2 is a Response to Comments Table for comments received from stakeholders, and how comments have been addressed in the final study plan. Where stakeholder comments requests have not been incorporated, Table 2 provides a rationale based on Project specific information and Federal Energy Regulatory Commission’s (FERC) Study Plan Criteria (18 Code of Federal Regulation [CFR] § 5.9).

**TABLE 1 KEY STUDY PLAN DEVELOPMENT MILESTONES
AND TECHNICAL WORKING GROUP PLANNING SCHEDULE**

DELIVERABLE	MATERIAL DISTRIBUTED	MEETING TYPE	TWG MEETING DATES	PROPOSED DATES FOR COMMENTS
Project Description	5/25/2018	TWG	6/4/2018, 6/5/2018, and 6/7/2018	7/9/2018
Annotated Study Plans, Goals, Objectives	7/26/2018	TWG	8/14/2018 and 8/15/2018	8/31/2018
Draft Study Plans	9/17/2018	TWG	10/9/2018 to 10/11/2018	10/26/2018
Final Study Plans	11/15/2018	TWG	12/4/2018 to 12/6/2018	1/7/2019

TABLE 2 SCE RESPONSES TO COMMENTS RECEIVED ON STUDY PLANS

COMMENT NO.	DATE OF TWG MEETING	ENTITY	COMMENT	SCE RESPONSE