PROPOSED
TECHNICAL STUDY PLANS

BISHOP CREEK HYDROELECTRIC PROJECT

FERC PROJECT NO. 1394

Prepared for:

SOUTHERN CALIFORNIA EDISON®
Energy for What's Ahead℠

Bishop, California

Prepared by:

Kleinschmidt

Portland, Oregon
www.KleinschmidtGroup.com

August 2019

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BISHOP, CALIFORNIA

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ACRONYMS

mg/L	milligrams per liter
1-D	One-dimensional

A

ACHP	Advisory Council on Historic Preservation
ADCP	Acoustic-Doppler Current Profiler
AGR	Agricultural Supply
APE	Area of Potential Effects
ARPA	Archaeological Resource Protection Act
ASBS	Areas of Special Biological Significance

B

Basin Plan	Water Quality Control Plan
BCHS	Bishop Creek Hydroelectric System
BIOL	Preservation of Biological Habitats of Special Significance
BLM	Bureau of Land Management

C

Ca	Calcium
Cal-IPC	California Invasive Plant Council
CEDEN	California Environmental Data Exchange Network
CHSC	California Health and Safety Code
CNDDB	California Natural Diversity Database
CDFW	California Department of Fish and Wildlife
CDPR	California Department of Parks and Recreation
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
cfs	cubic feet per second
cfu	Colony Forming Unit
Chandler Decree	1922 Chandler Decree
CHRIS	California Historical Resources Information System
cm	centimeter
COLD	Cold Freshwater Habitat
COMM	Commercial and Sportfishing
CWA	Clean Water Act
CY	cubic yard

D

DPS	Distinct Population Segment

E

EA	Environmental Assessment
ECIC	Eastern California Information Center
E. Coli	Escherichia coli
EIC	Eastern Information Center
ESE	Environmental Science and Engineering
ESA	Endangered Species Act

F

FERC	Federal Energy Regulatory Commission
FL	Fork Length
FLPMA	Federal Land Policy and Management Act
Form 80	FERC Form 80
FRSH	Freshwater Replenishment

G

GIS	Geographic Information System
GPS	Global Positioning System
GWR	Ground Water Recharge

H

HPMP	Historic Properties Management Plan
HRA	Historical Research Associates, Inc.
HSI	Habitat Suitability Index

I

IFIM	Instream Flow Incremental Methodology
IHA	Indicators of Hydrologic Alteration
ILP	Integrated Licensing Process
IND	Industrial Service Supply
INF	Inyo National Forest
IPaC	Information for Planning and Consultation
ITA	Indian Trust Assets

K

Kleinschmidt	Kleinschmidt Associates

L

LADWP	Los Angeles Department of Water and Power
LRWQCB	Lahontan Regional Water Quality Control Board
LWM	Large woody material

M

MIS	Management Indicator Species
ml	milliliter

mm	millimeters
msl	mean sea level
MUN	Municipal and Domestic Supply
MW	megawatts
MYLF	mountain yellow-legged frog

N

NAGPRA	Native American Graves Protection and Repatriation Act
NAHC	Native American Heritage Commission
NEPA	National Environmental Policy Act
NGO	non-governmental organizations
NHPA	National Historic Preservation Act
NOI	Notice of Intent
NPS	National Park Service
NRHP	National Register of Historic Places
NVUM	National Visitor Use Monitoring Program

O

O&M	Operation and Maintenance
OHP	Office of Historic Preservation

P

PA	Programmatic Agreement
PAD	Preliminary Application Document
PHABSIM	Physical Habitat Simulation
PME	Protection, Mitigation and Enhancement
POW	Hydropower Generation
PRO	Industrial Process Supply
Project	Bishop Creek Hydroelectric Project

R

REC-1	Water Contact Recreation
REC-2	Non-Contact Water Recreation
RTK	Real-Time Kinematic
RUN	Recreation Use and Needs
RWQCB	Regional Water Quality Control Board

S

S&G	Sediment and Geomorphology
Sales Agreement	1933 Sales Agreement
SCE	Southern California Edison Company
SCORP	Statewide Comprehensive Outdoor Recreation Plan
SD1	Scoping Document 1
SD2	Scoping Document 2
SHPO	State Historic Preservation Officer
SLA	Simons, Li & Associates

SNYLF	Sierra Nevada yellow-legged frog
SPWN	Spawning, Reproduction and/or Early Development
Study Plan	Technical Study Plan
SWAMP	Surface Water Ambient Monitoring Program
SWRCB	State Water Resources Control Board

T

TCP	Traditional Cultural Properties
TDS	Total Dissolved Solids
TL	Total Length
TWG	Technical Working Group

U

USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UTM	Universal Transverse Mercator

W

WILD	Wildlife Habitat
WSEL	Water Surface Elevation
WUA	Weighted Usable Area

Y

YOY	Young of year
YSI	Yellow Spring Instruments

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SOUTHERN CALIFORNIA EDISON COMPANY
BISHOP, CALIFORNIA

1.0 OVERVIEW

1.1 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), on lands managed by the Inyo National Forest (INF), the Bureau of Land Management (BLM), Bishop Field Office, and lands owned by SCE. SCE 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 Notice of Intent (NOI) and Pre-Application Document (PAD) with FERC on May 1, 2019.

SCE initiated early contact with stakeholders, as described in the Summary of Contacts (PAD, Volume II). The process started with a public event in March 2019, the purpose of which was to inform the public about the Project and upcoming opportunities to participate in the relicensing process. Following this public meeting, SCE formed Technical Working Groups (TWGs) with interested stakeholders to identify questions and potential issues that would be appropriate for the relicensing process. SCE held four technical workshops and webinars in 2018 and early 2019 to develop a common understanding of the issues to be addressed during the relicensing; stakeholders provided input on draft technical studies that were developed in response to these workshops.

SCE invited federal and state agencies, non-governmental organizations (NGO) and Native American Tribes and tribal organizations to participate in the public meeting and TWGs. To date, attendees at TWG meetings have included members of the Bishop Paiute Tribe, U.S. Forest

Service (USFS), California Department of Fish and Wildlife (CDFW), State Water Resource Control Board (SWRCB), U.S. Fish and Wildlife Service (USFWS), Kleinschmidt Associates (Kleinschmidt), Psomas, E. Read and Associates, Kearns & West, and Historic Research Associates (HRA).

During the TWG meetings, stakeholders identified the need to conduct the studies contained in this Technical Study Plan (Study Plan). This Study Plan details the study objectives, study area, methods and schedule for each study. This section provides a consultation summary of discussions specific to this Study Plan, along with a table 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.

Section 5 of the PAD (Volume I) summarized identified issues and provides an overview of the Technical Study Program that SCE believes will address questions of regarding Project impacts. Each plan has a consultation history that summarizes its development and how SCE addressed comments raised by stakeholders.

Following the filing of the PAD on May 1, 2019 SCE provided the following supplemental consultation opportunities (Appendix A)[1]:

- Via conference calls on June 11 and June 19, 2019 with the Fish & Aquatics Technical Work Group (TWG), and the Recreation and Terrestrial Resources Work Group, respectively.
- Written correspondence from the State Water Control Board (SWCB) requesting that the water quality study be modified to address potential for bacteria contamination in Project reservoirs.
- Written correspondence from the United States Department of Agriculture (USDA) USFS regarding the desired level of detail for the anticipated surveys being conducted to assess recreational uses and needs at the Project.
- Written correspondence dated August 26 from the USFS providing approval for the Revised Technical Study Plan, with the understanding that some remaining methodology and details can be resolved in the coming months in consultation with the appropriate TWGs.

[1] For comprehensive summary of consulation prior to filing of the PAD and NOI, see Volume II of the SCE's May 1, 2019 filing.

Stakeholder requests and comments through these engagements are summarized in each of the studies' response to comments tables, found at the end of each proposed study.

It is SCE's belief that the proposed Study Plans, as revised anticipate the range of issues that FERC may identify in its scope process under 18 Code of Federal Regulation (CFR) § 5.8 (Notice of Commencement of Proceeding and Scoping Document) and § 5.9 (Comments and Information or Study Requests). The final Study Plan will contain a history of all comments received during the process.

1.2 ANTICIPATED PROCESS FOR SEEKING WAIVERS OF THE REQUIREMENTS SPECIFIED IN 18 CFR § 5.11 (POTENTIAL APPLICANT'S PROPOSED STUDY PLAN) AND 18 CFR § 5.12 (COMMENTS ON PROPOSED STUDY PLAN)

SCE is using a relicensing process known as a hybrid ILP process. The intent of the hybrid ILP process is to reach an early agreement with stakeholders on issues and studies for the relicensing (typically earlier than under the standard ILP process) and expedite the Director of Energy's Study Plan Determination. Expediting the Study Plan Determination would 1) provide certainty on the studies and methods; and 2) allow SCE to focus on completing the technical studies early in the process to facilitate evaluation of Project effects and collaboratively develop new license conditions. Study Plans are being developed with an extensive consultation effort and will be filed as a supplemental volume to the PAD. SCE believes that this pro-active approach will avoid the need for Scoping Document 2 (SD2) and greatly accelerate the process.

SCE anticipates requesting that FERC waive the requirements specified in 18 CFR § 5.11 (Potential Applicant's Proposed Study Plan) and 18 CFR § 5.12 (Comments on Proposed Study Plan). The request would be filed following the close of the comment and study request period described in 18 CFR § 5.9. SCE will use the time between filing the PAD and NOI and the end of the comment period to resolve outstanding questions and technical issues the TWGs may have regarding the proposed Study Plans.

1.3 PROJECT DESCRIPTION

The Project facilities are located in the Owens Valley and in areas of the eastern Sierra Nevada in the County of Inyo, southwest of the City of Bishop. The Project's facilities are sited along Bishop Creek and its tributaries including South Fork, Middle Fork, Green Creek, Birch Creek

and McGee Creek. Bishop Creek is a tributary to the Owens River. Project facilities are located within the INF in the John Muir Wilderness (both of which are managed by the USFS), lands managed by BLM, and on private lands.

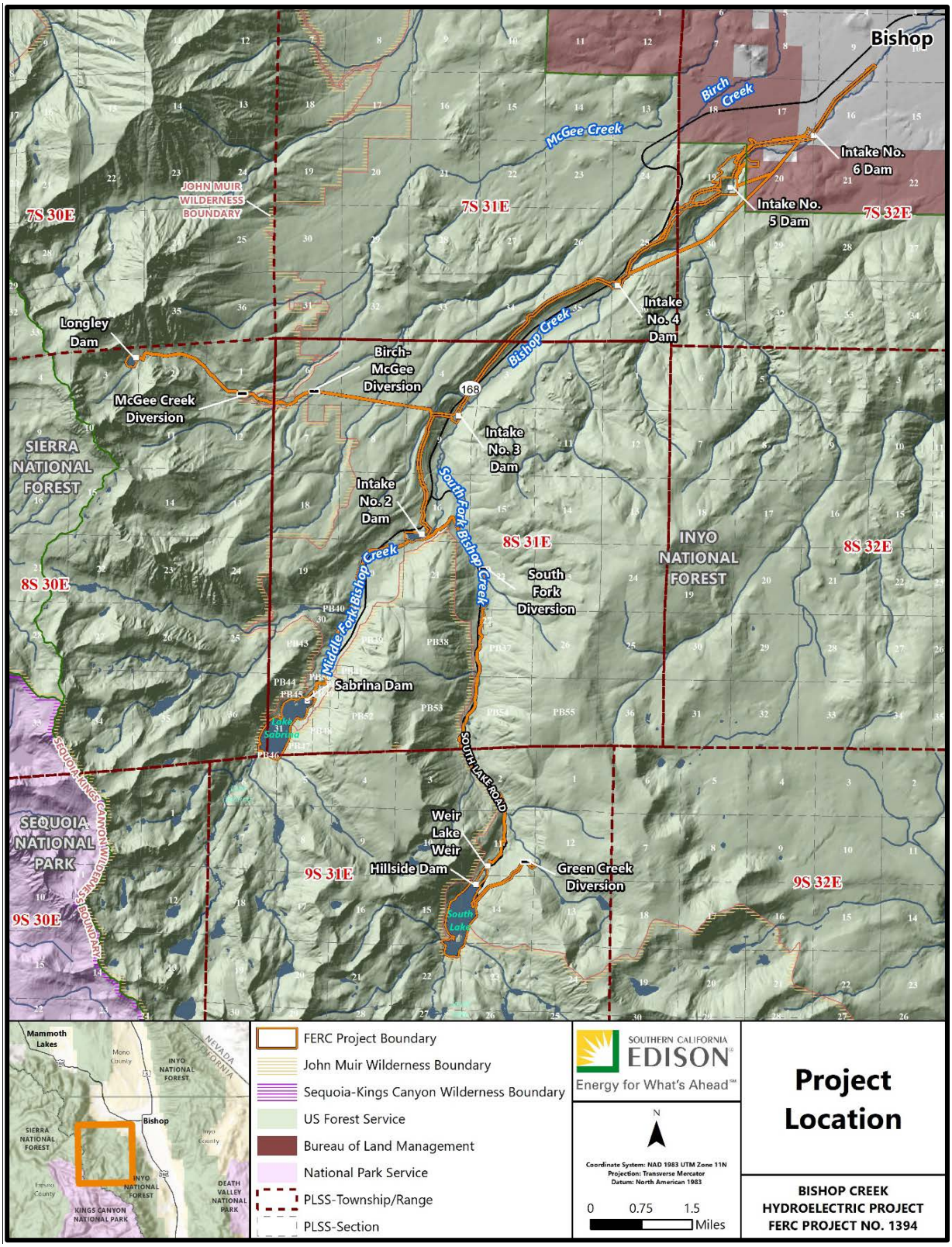


FIGURE 1-1 PROJECT LOCATION MAP

1.3.1 FACILITIES (EXISTING AND PROPOSED)

SCE proposes only limited modifications to facilities and operations for the next license term that are intended to facilitate implementation of long-term operational and maintenance (O&M) procedures.

The Project consists of 13 dams/diversions, and five powerhouses with a combined generating capacity of 28.565 megawatts (MW). The Project diverts water for power generation from the Middle and South forks of Bishop Creek, McGee Creek and Birch Creek through the five powerhouses and associated intakes as follows: 1) Powerhouse No. 2, immediately below the confluence of the Middle and South forks of Bishop Creek; 2) Powerhouse No. 3, three-miles below Powerhouse No. 2; 3) Powerhouse No. 4, approximately three-miles-below Powerhouse No. 3; 4) Powerhouse No. 5, approximately one-mile-below Powerhouse No. 4; and 5) Powerhouse No. 6, approximately two-miles-below Powerhouse No. 5. South Lake and Lake Sabrina are reservoirs that act as store-and-release facilities.

The dams and diversions are Green Creek Diversion, South Fork Diversion, Hillside Dam, Weir Lake Weir, Sabrina Dam, Longley Dam, Intake No. 2 Dam, Intake No. 3 Dam, Intake No. 4 Dam, Intake No. 5 Dam, Intake No. 6 Dam, Birch-McGee Diversion and McGee Creek Diversion. A more detailed Project description is contained in the PAD.

1.3.2 OPERATIONS (EXISTING AND PROPOSED)

Plant operation is dictated by water availability. The water scheduling priority is based on the requirements of a 1922 Chandler Decree (Chandler Decree) water rights adjudication and with wintertime flows regulated by the 1933 Sales Agreement (Sales Agreement) between Southern Sierra Power Company (predecessor to SCE) and Los Angeles Department of Water and Power (LADWP). Both the Chandler Decree and the Sales Agreement form the standard of operations for which all regulations must be prioritized. SCE must operate the Project in a manner consistent with minimum flow requirements.

SCE is not proposing any changes to the O&M of the Project. More information and a detailed description of Project operations are provided in the PAD.

1.4 PROVISIONS FOR PERIODIC PROGRESS REPORTS

SCE will provide stakeholders with progress reports regarding the Study Plans. Each study will have consultation needs that are specific to the study and described in the Study Plans. SCE will follow the standard FERC Study Plan reporting and meeting sequence. After the conduction of the studies, SCE will provide progress reports to stakeholders, and study results upon request. SCE will file an initial study report, according to the FERC-approved Study Plan Schedule, which would describe the progress of implementing the Study Plan, schedule and any changes to the studies or new proposed studies. A Study Plan meeting with stakeholders and FERC staff will take place within 15 days of the initial study report filing, and SCE will file a meeting summary within 15 days of the meeting. SCE anticipated holding additional TWG meetings in the spring of 2019 and a check-in by phone or webinar in the early fall of 2019, as well as any additional implementation-focused meetings on specific Study Plans that may be appropriate.

1.5 IMPLEMENTATION SCHEDULE FOR STUDY PROGRAM

Figure 1-2 provides FERC's required timeline for ILP pre-application activities.

SCE's proposed schedule, presented in Table 1-1, is based upon anticipation that a waiver will be sought for the Study Plan determination process of 18 CFR §5.11 and §5.12 of FERC's regulations (Section 1.2). Given the degree of early consultation completed to date, SCE will determine on a case-by-case basis whether some studies may be implemented prior to a formal determination by FERC. Criteria for early implementation include: 1) high degree of confidence that all questions and concerns addressed by the TWGs have been addressed; and 2) opportunities for completing studies early enough to have robust conversations with relicensing participants on appropriate Protection, Mitigation and Enhancement (PME) measures that may be part of the license application.

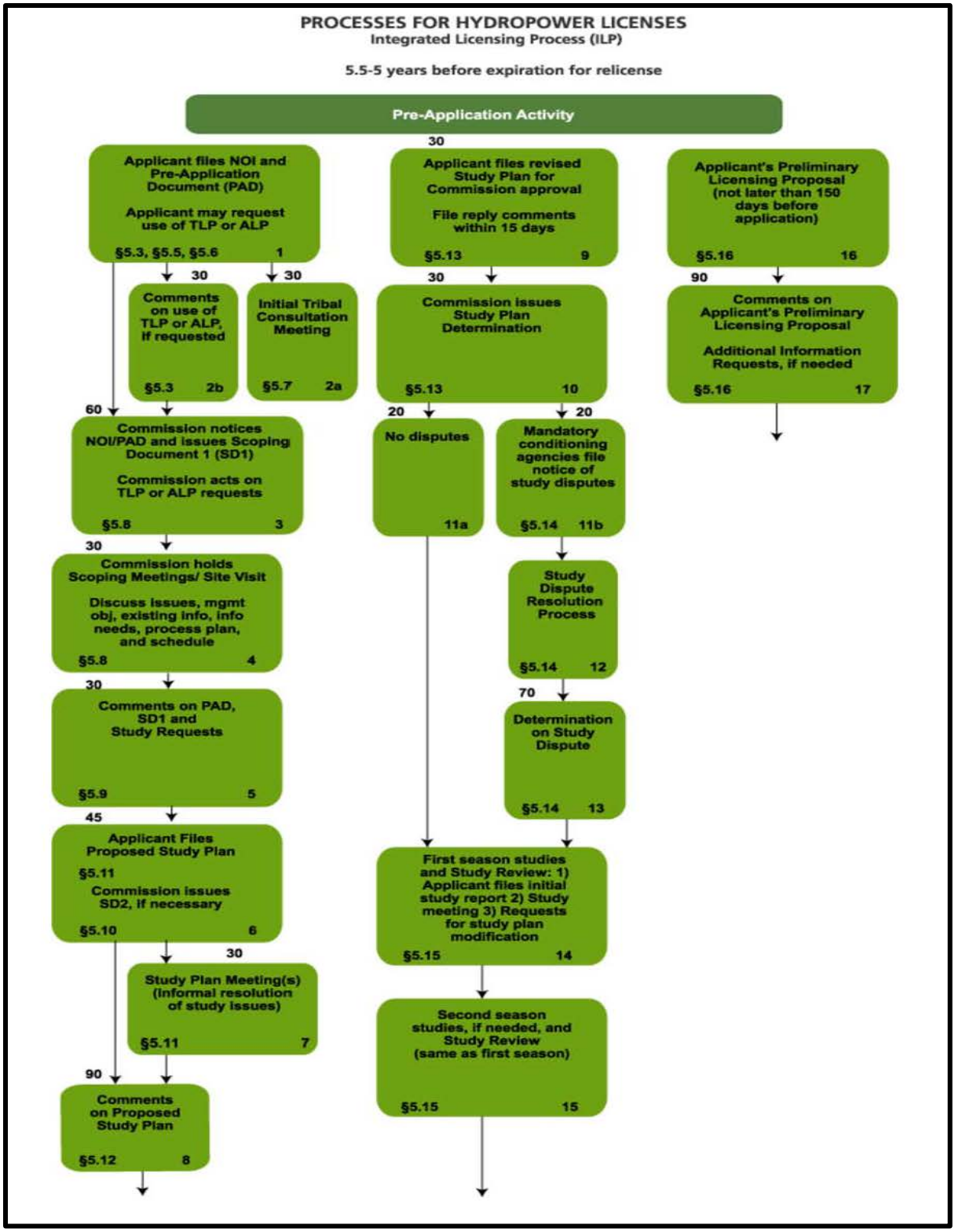
1.6 PROPOSAL FOR STUDY PLAN MEETING

As required by 18 CFR § 5.11(d)(6), SCE proposed to hold a Study Plan meeting within the 90-day period specified in 18 CFR § 5.12 – (Comments on Proposed Study Plan) for purpose of clarifying the proposed Study Plan and to gather initial information and receive study requests. SCE is holding November 6, 2019 for this meeting, which will be held at the Cerro Coso Community College (located at: 4090 W. Line Street Bishop, CA 93514-7306) from 8:30 AM to

5:00 PM. In the event that the waiver discussed in Section 1.2 above is granted, this meeting would not be required.

1.7 CONSIDERATIONS OF LEVEL OF EFFORT AND COST

SCE has proposed Study Plans that address the resources questions identified in the PAD, through early issue identification with stakeholders, and as identified in SD1. SCE believes these studies are appropriately scoped to address potential resources questions and have taken reasonable care to limit the level of effort and cost, consistent with best practices. As no alternative studies methods have been proposed to address identified questions, there appears to be no need for FERC to determine whether an alternative method may be preferred. Should alternatives be advanced during the comment periods described in 18 CFR § 5.12 and 5.13, SCE will clarify the basis for its selection of methods and practices.



Source: FERC 2018

FIGURE 1-2 INTEGRATED LICENSING PROCESS FOR HYDROPOWER LICENSES

TABLE 1-1 SCE PROPOSED STUDY PLAN DEVELOPMENT AND IMPLEMENTATION SCHEDULE FOR THE BISHOP CREEK HYDROELECTRIC PROJECT

FERC 18 CFR §	RELICENSING ACTIVITY	RESPONSIBLE PARTY	ACTIVITY TIME FRAME	DEADLINE[1,2] (HYBRID ILP)	DEADLINE (STANDARD ILP)
5.5-5.6	**Filing of PAD and NOI**	SCE	Five to five and a half years prior to existing license expiration Filed concurrent with PAD	5/1/2019	5/1/2019
5.7	**Initial Tribal Consultation Meeting**	FERC	Within 30 days following filing of NOI/PAD	5/31/2019	5/31/2019
5.8 5.8(a)	**Notice of Commencement of Proceeding and Scoping Document**	FERC	Within 60 days of filing NOI/PAD.	7/1/2019	7/1/2019
5.8(c)	Issue Scoping Document 1 (SD1)	FERC	Concurrent with notice of commencement of proceeding.	7/1/2019	7/1/2019
5.8(b)(3)(viii)	**Conduct Public Scoping Meeting and Site Visit**	FERC	Within 30 days of the notice of commencement of proceeding	7/31/2019	7/31/2019
5.9 (a)	File comments on PAD and SD1, and provide study requests	Participants	Within 60 days following the notice of commencement of proceeding	8/29/2019	8/29/2019
	SCE notify (email) Regulatory Oversight Group of proposed request to expedite the Study Plan Determination Process (waiver)	SCE	Work with Regulatory Oversight Group prior to end of comment period to gain support on request to expedite the Study Plan process	Mid July 2019	N/A
	Submit request for waiver of FERC regulations (waive Sections 5.11 and 5.12)	SCE	File the day after comment period (provided no comments received)	9/5/2019	N/A
	Issue Notice of Request for waiver of FERC regulations	FERC	Within seven days of receipt of request for waiver of FERC regulations	9/10/2019	N/A
	File comments on request for waiver of FERC regulations	FERC	Within 15 days following the Notice of Request for Waiver from FERC Regulations	9/24/2019	N/A
	File notice of approval of request for waiver of FERC regulations	FERC	Within 15 days following the Notice of Request for Waiver from FERC Regulations	10/24/2019	N/A

FERC 18 CFR §	RELICENSING ACTIVITY	RESPONSIBLE PARTY	ACTIVITY TIME FRAME	DEADLINE[1,2] (HYBRID ILP)	DEADLINE (STANDARD ILP)
5.10	Issue SD2 (if necessary)	FERC	Within 45 days following the deadline for comments on SD1; *would not be necessary if waiver is approved.*	N/A	10/14//2019
5.11(a)	**File Proposed Study Plan**	SCE	Not applicable under proposed process: Study Plan filed with PAD/NOI	N/A	10/14/2019
5.11(e)	File proposal for conducting Study Plan meeting(s) during 90-day proposed Study Plan review period.	SCE	Not applicable under proposed process	N/A	10/14/2019
5.11(e)	**Conduct Initial Study Plan Meeting**	SCE	Not applicable under proposed process	N/A	11/6/2019
5.12	File comments on Proposed Study Plan or submit revised study requests	Participants	Not applicable under proposed process	N/A	1/13/2019
5.13	**Revised Study Plan and Study Plan Determination**				
5.13(a)	File Revised Study Plan	SCE	FERC would consider Study Plan to be Revised Study Plan	N/A	2/10/2020
5.13(b)	File final comments on Revised Study Plan	Participants	Within 15 days following issuance of requested waiver of 5.11 and 5.12	10/24/2019	2/25/2020
5.13(c)	**Issue Study Plan Determination**	FERC	15 days following the deadline for filing comments on the Revised Study Plan.	11/08/2019	3/11/2020
5.15(a)	Conduct First Year Studies (for Study Plans not under dispute)	SCE	October 1, 2019 through September 30, 2020		
5.15(b) 5.15(c)(1)	File progress report and Initial Study Report	SCE	Within one year after FERC approval of the Study Plan	11/09/2020	3/11/2021
5.15(c)(2)	Conduct Initial Study Report Meeting	SCE	Within 15 days of filing the Initial Study Report	11/24/2020	3/26/2021
5.15(c)(3)	File Initial Study Report Meeting Summary, including any study modifications or new studies	SCE	Within 15 days following the Initial Study Report Meeting	12/09/2020	4/10/2021
5.15(f)	Conduct Second Year Studies	SCE	October 1, 2020 through September 30, 2021		

FERC 18 CFR §	RELICENSING ACTIVITY	RESPONSIBLE PARTY	ACTIVITY TIME FRAME	DEADLINE[1,2] (HYBRID ILP)	DEADLINE (STANDARD ILP)
5.15(f)	File progress report and Updated Study Report	SCE	Within 2 years after FERC approval of the Study Plan	11/09/2021	3/11/2022
5.15(c)(2)	Conduct Updated Study Report Meeting	SCE	Within 15 days of filing the Updated Study Report	11/24/2021	3/28/2022
5.15(c)(3)	File Updated Study Report Meeting Summary, including any study modifications or new studies	SCE	Within 15 days following the Updated Study Report Meeting	12/09/2021	4/11/2022
5.15(f)	Promptly proceed with any remaining undisputed studies or amended studies	SCE			
5.16(a)	**File Preliminary Licensing Proposal or Draft Application**	SCE	No later than 150 days prior to the deadline for filing a new license application.	1/31/2022	1/31/2022
5.16(e)	File comments on Preliminary Licensing Proposal or Draft License Application	FERC and Participants	Within 90 days of the filing date of the Preliminary Licensing Proposal or Draft Application	5/2/2022	5/2/2022
5.17(a)	**File License Application**	SCE	No later than 24 months before the existing license expires	6/30/2022	6/30/2022

Notes:

1. For comparison purposes, the table provides the deadline for each item if SCE were to use the standard ILP process*.
2. If deadline falls on a weekend or holiday, the deadline was moved to the following business day.
3. Time periods begin the day after a filing/issuance date.
4. Full Schedule Available in the PAD, Section 2

** Items in blue represent contingent processes in the event of a study dispute; items in green represent proposed discretionary processes to achieve an accelerated Study Plan determination.

2.0 TERRESTRIAL AND BOTANICAL STUDY PLANS

2.1 ASSESSMENT OF BISHOP CREEK RIPARIAN COMMUNITY STUDY PLAN (TERR 1)

2.1.1 PROJECT NEXUS AND RATIONALE FOR STUDY

During TWG meetings, stakeholders discussed data and anecdotal observations that black cottonwood (*P. balsamifera ssp. trichocarpa*) cover, recruitment and mortality in riparian areas may be in decline; there was an interest in understanding potential causes. After the TWG meetings, stakeholders requested that the study topic be broadened to address changes in the riparian community as a whole, including black cottonwoods. If changes are identified, the study will assess any potential relationship between these changes and Project flows and or operations. This Study Plan details the study objectives, study area, methods and schedule for the Assessment of Bishop Creek Riparian Community Study.

Results from license-compliance riparian monitoring reported from the 2014[2] field season (Read 2015) indicated a decline in cottonwood abundance at all three sites that were monitored on Bishop Creek. An analysis of the five-year riparian monitoring results also indicated a possible decline and lack of recruitment for black cottonwood. This effort is intended to determine if the reported decline may be related to Project operations, and relationships (if any) or to the condition of the riparian community as a whole.

2.1.2 STUDY GOALS AND OBJECTIVES

This Assessment of the Bishop Creek Riparian Community has the following objectives:

1. Characterize the riparian community using the long-term monitoring dataset generated from monitoring conducted in compliance with the existing license in terms of the goals and objectives of riparian ecosystem health contained in the Land Management Plan for the Inyo National Forest (USDA 2018);
2. Review and assess black cottonwood abundance and determine whether the decline observed in 2014 (baseline) is within a natural range of variability or could be related to Project operations.
3. Ensure that future Project facilities and operations are consistent with the Desired Conditions described in the Land Management Plan for the Inyo National Forest (USDA

[2] The 2014 Monitoring Report is not included in this Study Plan but is located on the Bishop Creek Relicensing Website (www.sce.com/bishopcreek).

2018) as they relate to ecological sustainability and diversity of plant and animal communities.

2.1.3 LIFE HISTORY INFORMATION

Native plant species that occupy the riparian zone have a range of life histories that can be grouped into "guilds", using an approach described by Lytle et al. (2017). In many cases these life histories are well documented in the literature, making the guild approach a useful tool for analyzing data in an ecological context instead of species by species. For example, the life history of black cottonwood has been summarized by Steinberg (2001) and Sawyer et al. (2009). It is a deciduous tree that can live to 200 years old or more. Reproduction is most often asexual (clonal), through root suckers and sprouts. Sexual reproduction through seed dispersal often occurs when stream or river flows begin to decline in spring. However, while seed production can be prolific, seed viability lasts only a few weeks and successful seedling establishment is episodic. Establishment depends on a coincidence of events; wherein mature seeds are produced when there will be sufficient soil moisture during the first month of growth. Seedling mortality can be high if root growth is slower than recession of the water table or stream.

No diseases causing widespread mortality are known for black cottonwood except for a disease transmitted by an invasive insect native to Southeast Asia (polyphagous shothole borer [*Euwallacea* nr. *Fornicates*]). However, this insect has not been reported to occur in Inyo County and its distribution appears limited to southern California counties at this time (CalInvasives n.d.).

2.1.4 REVIEW OF EXISTING INFORMATION

Read (2015) describes results from license-compliant riparian monitoring in 2014 compared to previous years (dating back to 1991 to 1993, baseline period), prior to implementation of the minimum instream flow program as required by the existing license. Again, using cottonwood to exemplify a "hydroriparian" guild, all three monitored sites on Bishop Creek in 2014 showed a decline in cottonwood abundance compared to baseline, with the greatest decline exhibited on one monitoring site downstream of Plant 4. This loss is contrary to expectations that riparian vegetation would respond positively to the addition of stream flow in a reach that was normally dry during the summer prior to the implementation of the required instream flow release program

in 1994. Black cottonwoods were not present in monitored sites on Birch and McGee creeks in 2014 or previous year; however, possible reasons for their absence could be relevant to the decline on Bishop Creek, therefore these creeks would be included in the study. In addition to the license-compliant studies, results of earlier studies of riparian vegetation on Bishop Creek (e.g. Stromberg and Patten 1991) will be reviewed and interpreted in light of data collected as part of the license-compliant monitoring.

2.1.5 STUDY AREA

Figure 2-1 shows the existing monitoring sites and the proposed study area for the proposed Assessment of Bishop Creek Riparian Community. The study area will include regulated stream reaches below Project diversions and reservoirs, consistent with the current Riparian Monitoring protocols.

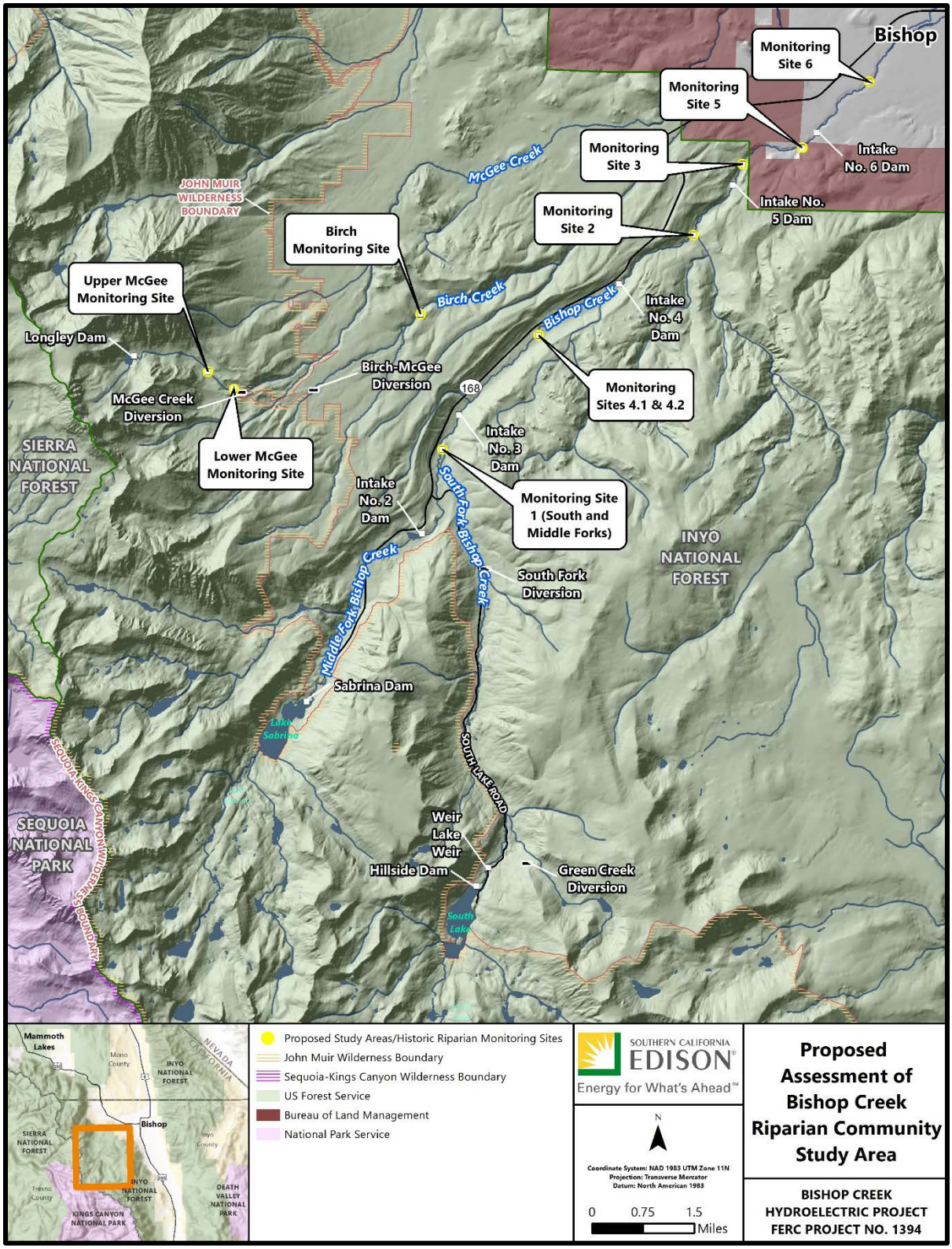


FIGURE 2-1 PROPOSED ASSESSMENT OF BISHOP CREEK RIPARIAN COMMUNITY STUDY AREA

2.1.6 METHODS

Monitoring data collected from 1991 through 2014, and anticipated to be collected in 2019 in compliance with Federal Power Act Section 4(e) conditions of the existing license, will be re-analyzed using the guild approach of Lytle et al. (2017) to assess the condition of the riparian community as a whole. In this guild approach, species that share similar "vital rates" (fecundity, mortality, self-thinning) are analyzed as a group rather than as individual species. This approach can be limited by how much is known about the life histories of these species, so therefore the analysis is likely to be limited to species whose life histories are well documented in the literature. The data will be assessed in relation to hydrologic data available for depth to groundwater and stream flow to determine the extent to which Project operations (as differentiated from natural variability in precipitation and other factors) may affect the various guilds of species. If a relationship is identified, a plan to facilitate recovery will be developed. Results of this effort will be integrated with the ongoing data collection and reporting protocols for the Riparian Monitoring Program to supplement understanding of how these data relate to goals and objective of riparian ecosystem health contained in the Land Management Plan for the Inyo National Forest (USDA 2018).

2.1.7 SCHEDULE, PERIODIC REPORTING AND ONGOING CONSULTATION

The anticipated Study Plan development and implementation schedule is identified in Table 2-1. As described in the PAD and NOI, SCE anticipates an expedited Study Plan determination process for some plans or for portions of some.

TABLE 2-1 ANTICIPATED POST PAD/NOI STUDY PLAN DEVELOPMENT MILESTONES AND FERC PROCESS THROUGH STUDY PLAN DETERMINATION

TASK	RESPONSIBLE ENTITY	SCHEDULE MILESTONES
File NOI/PAD with FERC along with Proposed Study Plans	SCE	May 1, 2019
FERC Holds Scoping and Site Visit	FERC	July 1, 2019-July 31, 2019
Deadline for Comments on PAD and Study Requests	Stakeholders	Aug 30, 2019
Request for waiver of 18 CFR 5.12 and 5.13	SCE	Sept 2, 2019
Preliminary Field Season[1]	SCE	2019
Fall TWG Workshop	SCE & TWG	Nov 2019
FERC Director's Study Plan Determination (assumes waiver granted)	FERC	Nov 8, 2019
First Field Season	SCE	2019
Initial Study Report (adjust as necessary in consultation with TWGs)	SCE	Nov 9, 2020
Second Field Season (as necessary)	SCE	2020
Final Study Report	SCE	Nov 9, 2021
License Application	SCE	June 2022

[1] Note: Because the 2019 field season precedes the Study Plan Determination is noted as "preliminary" because to avoid confusion with the FERC sequence of field season followed by Initial Study Report. For similar reasons, a fall TWG workshop is offered to review the results of the preliminary field season

This schedule is predicated on attaining agency agreement on the general goals, objectives and methods of the study, with the understanding that additional details may be resolved between the filing of the PAD and NOI, and the deadline for stakeholders to file comments on the PAD and make study requests. As well, there are additional decisions and ongoing consultation needs throughout the implementation of the study. For this plan, the outstanding items for consultation are listed in Table 2-2. This table distinguishes between those items that require resolution before the study can be implemented, and those that would be the subject of ongoing consultation with the appropriate TWG.

TABLE 2-2 OUTSTANDING ITEMS FOR CONSULTATION AND RESOLUTION

IMPLEMENTATION DETAIL FOR RESOLUTION	SCHEDULE FOR RESOLUTION
Final edits and implementation details with USFS	June-July 2019
Field schedule and implementation Plan	June-July 2019

2.1.8 STUDY PLAN CONSULTATION RECORD

This Study Plan has been developed in consultation with the Bishop Creek Terrestrial and Botanical Resources 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 section summarizes the key consultation milestones for each Study Plan (Table 2-3), and how SCE addressed comments received through the consultation process. Table 2-4 is a Response to Comments Table for comments received from stakeholders, and how comments were addressed in the final Study Plan. If stakeholder comments were not incorporated, Table 2-4 rationale based on Project specific information and FERC's Study Plan Criteria (18 CFR § 5.9).

TABLE 2-3 KEY STUDY PLAN DEVELOPMENT MILESTONES

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
Revised Study Plans	11/15/2018	TWG	12/4/2018 to 12/6/2018	1/7/2019
Proposed Study Plans (filed with PAD)	5/1/2019	TWG	6/12/2019 and 6/19/2019	7/12/2019

TABLE 2-4 SCE RESPONSES TO COMMENTS RECEIVED ON STUDY PLANS

COMMENT NO.	DATE OF COMMENT	ENTITY	COMMENT	SCE RESPONSE
1	8/31/2018	Tristan Leong, USFS	Propose refocus on riparian community with black cottonwood as a sub-objective, and utilizing USFS riparian monitoring protocols	SCE agrees with the broader focus. Given the monitoring efforts and approach from the current license term, SCE sees risks with starting a new protocol and would like to understand USFS concerns with existing riparian monitoring approach, which came about as a 4(e) condition. The monitoring program includes all indicators of riparian ecosystem health contained in the Land Management Plan for the INF (USDA, 2018); therefore, restarting this effort with a new protocol would be counter-productive (SCE will provide a cross-walk between these indicators and the monitoring study results). The 2014 Monitoring Report is incorporated by reference (Read 2015) and available at the Bishop Creek Relicensing Website (www.sce.com/bishopcreek) SCE notes that the report will also be updated in 2020 based on 2019 data.
2	8/31/2018	Tristan Leong, USFS	Revise objectives relative to any observed black cottonwood decline to assess possible causes	SCE will revise the study objectives to be consistent with these edits.
3	8/31/2018	Tristan Leong, USFS	Project nexus- Analysis of the five-year riparian monitoring results indicated a possible decline and lack of recruitment for black cottonwood, study should investigate the decline and determine probable causes.	SCE will revise Project nexus to be consistent with the proposed language and refocus of assessment on riparian community.
4	8/31/2018	Tristan Leong, USFS	Study goal- Need to establish a baseline - what is the current extent and condition of cottonwood along Bishop Creek, how much recruitment is	Monitoring efforts from current license term should provide information to assess against existing information (baseline) and establish parameters for evaluating factors discussed in this comment.

COMMENT NO.	DATE OF COMMENT	ENTITY	COMMENT	SCE RESPONSE
			occurring and where, is there a relationship to project operations, or other project-related disturbance (e.g. dispersed recreation/fishing access).	
5	8/31/2018	Tristan Leong, USFS	Study area- Needs to include lands within the current boundary and project affected stream reaches affected by the project operations where potential habitat for cottonwood exists.	SCE agrees with broader study area but proposes to focus primarily on established monitoring sites to make best use of existing data collected as part of long-term riparian monitoring efforts.
6	8/31/2018	Tristan Leong, USFS	Methods- Should include review of existing monitoring data and 2019 information to determine quantitative trends in abundance, recruitment and mortality; field inventory to determine extent of cottonwood, age classes and impacts from recreation.	SCE agrees with this review. As requested by INF comments, the entire study will be broadened to an analysis of the riparian community as a whole.

2.1.9 REFERENCES

CalInvasives. n.d. "*Euwallacea* nr. *Fornicatus* – Polyphagous Shot Hole, a complex." http://www.calflora.org/entry/pathogen.html?id=pth18. Accessed March 21, 2019.

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Sawyer, J.O., Keeler-Wolf, T., and Evens, J.M. 2009. A Manual of California Vegetation. California Native Plant Society Press, Sacramento, California.

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United States Department of Agriculture (USDA). 2018. Land Management Plan for the Inyo National Forest. https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd589652.pdf.

2.2 INVASIVE PLANTS STUDY PLAN (TERR 2)

2.2.1 PROJECT NEXUS AND RATIONALE FOR STUDY

During TWG meetings, stakeholders identified the need for an Assessment of Invasive Plants to determine the type and distribution of invasive plants observed at the Project site, as well as assess the potential for other invasive species, and determine control and management protocols. This Study Plan details SCE's proposal for study objectives, study area, methods and schedule for the assessment.

Invasive plant species have been observed near Plant 4, along stream reaches, and along access roads in the study area. An assessment of invasive plants in the Project area will be important to plan for appropriate long-term O&M best practices under a new license.

2.2.2 STUDY GOALS AND OBJECTIVES

- Classify and map the existing population of invasive plants in the Project area
- Assess the extent to which the Project may contribute to the spread of invasive plants which could adversely impact native ecosystems in the study area
- Ensure that future Project facilities and operations are consistent with the Desired Conditions, Goals, and Standards described in the Land Management Plan for the Inyo National Forest (USDA 2018) as they relate to ecological sustainability and biodiversity

2.2.3 REVIEW OF EXISTING INFORMATION

Appendix B to the Land Management Plan for the Inyo National Forest (USDA, 2018) lists 58 invasive plant species with eradication, treatment and control options identified for each species depending on life history and degree of threat to native ecosystems. These species range from annuals (growth and reproduction in one year) to perennials (growth and reproduction over many years) and include a wide range of growth forms, from grasses to forbs, shrubs, and trees. This study will include this document as part of an invasive species management plan for the Project area, as life history information will be necessary to inform proposed management practices.

Data collected as part of license-compliant monitoring (Read 2015) shows that one invasive tree species, black locust (*Robinia pseudoacacia*), appeared at one of the monitoring sites downstream of Plant 4 after the minimum instream flow program was implemented in 1994. The tree is present downstream and upstream of the monitoring site, occurring in the landscape and

nearby areas around Plant 4; therefore, it is unclear where the new plants at the monitoring site originated. Given the species' popularity in landscaping, the INF indicated that containment would be a more realistic goal compared to complete eradication. The INF proposes containment for cheatgrass (*Bromus tectorum*), an invasive grass, that expanded in the Birch and McGee creek watersheds after the Forks fire of 2009, and prickly Russian thistle (*Salsola tragus*). Other invasive species are known to exist in California and are ranked by the California Invasive Plants Council (Cal-IPC) according to level of threat to native ecosystems (Cal-IPC 2018).

2.2.4 STUDY AREA

The study area consists of the Project facilities including powerhouses, dams, diversions, valve houses and access roads that include 500-foot survey area around each facility; this buffer will also encompass recreation facilities in the Project area (Recreation Use and Needs Study). This survey area may be expanded depending on observations. A dense population of the invasive black locust (*Robinia pseudoacacia*) was observed immediately downstream of Plant 4; other invasive plant species may be present in that reach. Therefore, the survey area will expand beyond 500 feet from Plant 4 to document these populations and develop control and/or containment measures.

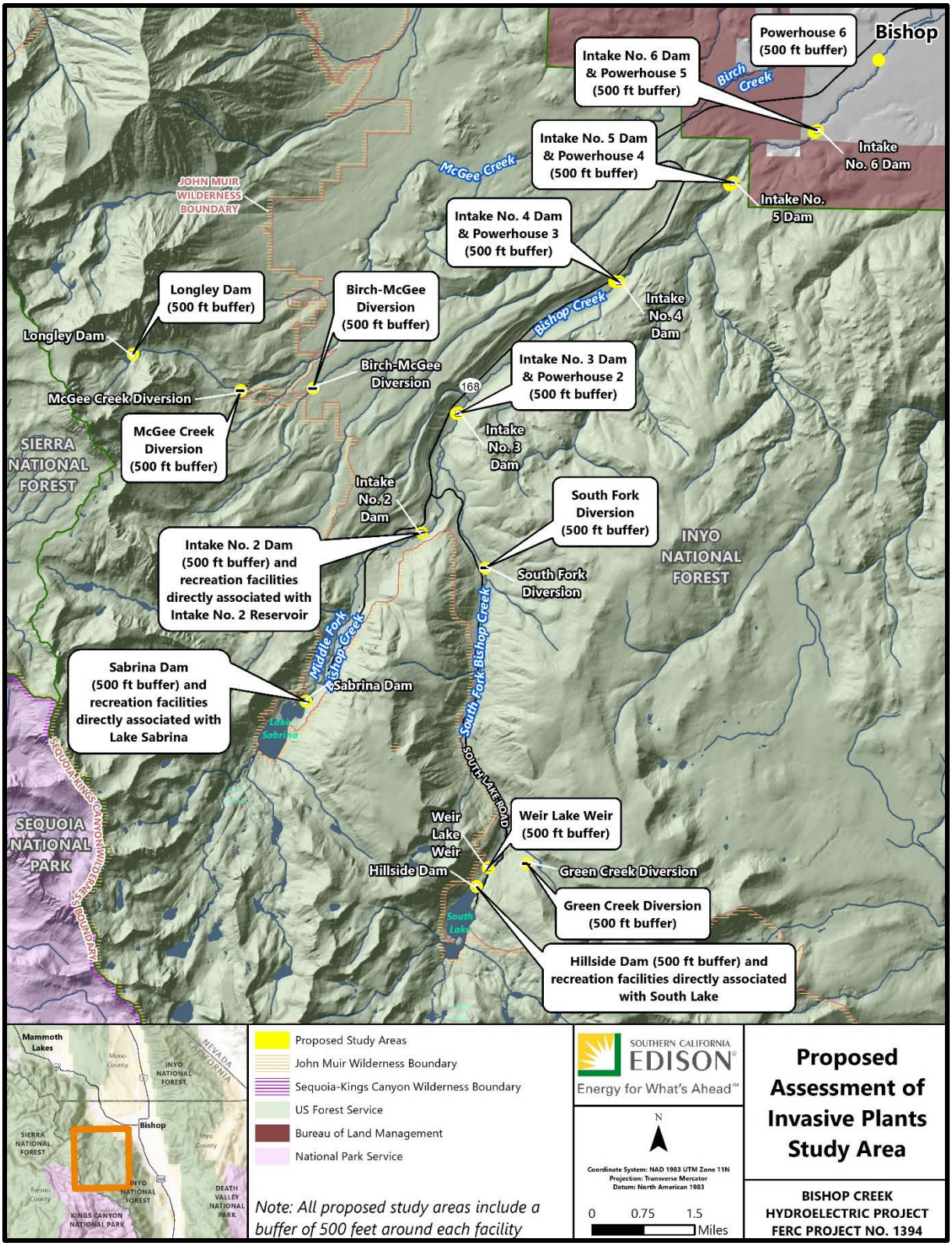

FIGURE 2-2 PROPOSED STUDY AREAS FOR INVASIVE PLANTS ASSESSMENT

2.2.5 METHODS

The focus will be on species of concern to the INF and species ranked by the Cal-IPC as having a high or moderate threat to native ecosystems. Some of these species have not been reported to occur in the Project region but would be placed on a watch list for surveys during the term of the new license. The watch lists will be used to develop protocols for SCE control and management, including review of future landscape plans for power facilities if they are proposed within the terms of the new license. One field survey in 2020 is proposed for each study area to update the above lists with new occurrences (if any) and refine management protocols consistent with the Land Management Plan for the Inyo National Forest (USDA 2018). Surveys around higher elevation facilities (i.e. Longley Lake) will be limited to one-time observational reconnaissance unless invasive species are detected.

2.2.6 SCHEDULE, PERIODIC REPORTING AND ONGOING CONSULTATION

The anticipated Study Plan development and implementation schedule is identified in Table 2-5. As described in the PAD and NOI, SCE anticipates seeking an expedited Study Plan determination process for some plans or for portions of some plans.

TABLE 2-5 ANTICIPATED POST PAD/NOI STUDY PLAN DEVELOPMENT MILESTONES AND FERC PROCESS THROUGH STUDY PLAN DETERMINATION

TASK	RESPONSIBLE ENTITY	SCHEDULE MILESTONES
File NOI/PAD with FERC along with Proposed Study Plans	SCE	May 1, 2019
FERC Holds Scoping and Site Visit	FERC	July 1, 2019-July 31, 2019
Deadline for Comments on PAD and Study Requests	Stakeholders	Aug 30, 2019
Preliminary Field Season[1]	SCE	2019
Fall TWG Workshop	SCE & TWG	Nov 2019
Request for waiver of 18 CFR 5.12 & 5.13	SCE	Sep 2, 2019
FERC Director's Study Plan Determination (assumes waiver granted)	FERC	Nov 8, 2019
First Field Season	SCE	2019
Initial Study Report (adjust as necessary in consultation with TWGs)	SCE	Nov 9, 2020
Second Field Season (as necessary)	SCE	2020
Final Study Report	SCE	Nov 9, 2021
License Application	SCE	June 2022

[1] Note: Because the 2019 field season precedes the Study Plan Determination is noted as "preliminary" because to avoid confusion with the FERC sequence of field season followed by Initial Study Report. For similar reasons, a fall TWG workshop is offered to review the results of the preliminary field season

This schedule is predicated on attaining agency agreement on the general goals, objectives and methods of the study, with the understanding that additional details may be resolved between the filing of the PAD and NOI, and the deadline for stakeholders to file comments on the PAD and make study requests. As well, there are additional decisions and ongoing consultation needs throughout the implementation of the study. For this plan, the outstanding items for consultation are listed in Table 2-6. This table distinguishes between those items that require resolution before the study can be implemented, and those that would be the subject of ongoing consultation with the appropriate TWG.

TABLE 2-6 OUTSTANDING ITEMS FOR CONSULTATION AND RESOLUTION

IMPLEMENTATION DETAIL FOR RESOLUTION	SCHEDULE FOR RESOLUTION
Final edits and implementation details with USFS	June-July 2019
Field schedule and Implementation Plan	June-July 2019

2.2.7 STUDY PLAN CONSULTATION RECORD

This Study Plan has been developed in consultation with the Bishop Creek Terrestrial and Botanical Resources TWG. The intent of the consultation process was 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 section summarizes the key consultation milestones for each Study Plan (Table 2-7), and how SCE addressed comments received through the consultation process. Table 2-8 is a Response to Comments Table for comments received from stakeholders, and how comments were addressed in the final Study Plan. Where stakeholder comments requests have not been incorporated, Table 2-8 provides a rationale based on Project specific information and FERC's Study Plan Criteria (18 CFR § 5.9).

TABLE 2-7 KEY STUDY PLAN DEVELOPMENT MILESTONES AND TECHNICAL WORK 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
Revised Study Plans	11/15/2018	TWG	12/4/2018 to 12/6/2018	1/7/2019
Proposed Study Plans (filed with PAD)	5/1/2019	TWG	6/12/2019 and 6/19/2019	7/12/2019

TABLE 2-8 SCE RESPONSES TO COMMENTS RECEIVED ON STUDY PLANS

COMMENT NO.	DATE OF COMMENT	ENTITY	COMMENT	SCE RESPONSE
1	8/15/2018	TWG Meeting	Plan should include USFS weed list and removal/treatment options.	SCE agrees the weed list provided to the August TWG should be added. Treatment options are ultimately a mitigation discussion; however, the study should help inform the discussion.
2	8/31/2018	Tristan Leong, USFS	Include recreation sites and Project affected areas in assessment survey.	SCE has modified the study area to include recreation facilities as described in the Recreation Use and Needs study.
3	8/31/2018	Tristan Leong, USFS	Because the study area as currently proposed is point-specific with buffers, the question regarding the extent of Robinia along Bishop Creek is unable to be answered. Survey should include an inventory along the Project affected stream reaches to document the current extent of Robinia and understand relationship of distribution to Project facilities. (Survey for cottonwood distribution could occur concurrently along the stream corridor).	SCE has modified this Study Plan to provide for surveys below project facilities including and below Intake 2.
4	8/31/2018	Tristan Leong, USFS	Need to consider Cal-IPC ratings, CDFA ratings, INF species prioritization-not just go with Cal-IPC ratings.	Consistent with TWG meetings, SCE will update Study Plans.
5	8/31/2018	Tristan Leong, USFS	Propose objective to classify and map the existing population of invasive plants in the Project area. Extend mapping outside Project should be discussed	SCE agrees with objective and that some level of field mapping is warranted including Project affected areas not specifically within the Project area.
6	10/10/2018	LeeAnn Murphy,	USFS would like a baseline assessment of the	SCE agrees that existing vegetation layers for the area

COMMENT NO.	DATE OF COMMENT	ENTITY	COMMENT	SCE RESPONSE
		USFS (TWG Discussion)	vegetation community but that the level-of-specificity is up for discussion. For instance, it could take the form of a simple geographic information system (GIS) exercise looking at how plant community types have shifted over the past decades and what might be due to Project impacts.	should be reviewed, and that this analysis can be included in the PAD, whereupon it can be determined if further information is needed to understand potential project impacts.
7	10/10/2018	LeeAnn Murphy, USFS (TWG Discussion)	Additional discussion around scope of proposed study and study area. Typically, surveys are done before ground disturbing activities	SCE noted that they have a relatively reliable baseline for special status plants in the watershed as a whole. They still need a better baseline for invasive plants, which is why the Study Plan proposes doing invasive surveys around the facilities. They will record any special status plants during those surveys but do not plan to do the multi-season, multi-year studies required to accurately catalogue all the special status plants. Additional analysis of existing data to get a better sense of baseline conditions; SCE will explore potential for using USFS GIS vegetation maps.

2.2.8 REFERENCES

California Invasive Plant Council (Cal-IPC). 2018. The Cal-IPC Inventory. https://www.cal-ipc.org/plants/inventory/.

Read, E. 2015. Riparian Monitoring Results for 2014 and Comparison to Previous Years. Final Report prepared for Southern California Edison.

United States Department of Agriculture (USDA). 2018. Land Management Plan for the Inyo National Forest. https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd589652.pdf.

2.3 ASSESSMENT OF SPECIAL STATUS PLANTS STUDY PLAN (TERR 3)

2.3.1 PROJECT NEXUS AND RATIONALE FOR STUDY

During TWG meetings, stakeholders identified the need for an Assessment of Sensitive Plants. This study will identify sensitive plant species with a high potential of occurring within the Project boundary, assess the potential for Project impacts and identify mitigation measures for the species with high potential for occurrence. This Study Plan details SCE's proposal for study objectives, study area, methods and schedule for the Sensitive Plant Study.

Populations of special status plant species have been reported within the study area. Many of these occur in the habitat types present adjacent to Project facilities and along stream reaches affected by the Project.

2.3.2 STUDY GOALS AND OBJECTIVES

- Classify and map the existing distribution of special status plants (including aquatic plants) in the Project area and Project affected reaches;
- Assess the extent to which the Project may affect rare, threatened, endangered or other special status species; and
- Ensure that future Project facilities and operations are consistent with the Desired Conditions, Goals and Standards described for animal and plant species in the Land Management Plan for the Inyo National Forest (USDA 2018).

2.3.3 REVIEW OF EXISTING INFORMATION

Searches of the California Natural Diversity Database (CNDD) (CDFW 2018) and the California Native Plant Society's Inventory of Rare, Threatened and Endangered Plants (CNPS 2018) identified a total of 26 species reported from the Project area. One of these species, Father Crowley's Lupine (*Lupinus padre-crowlei*), is a state listed rare species and four have special status under the Land Management Plan for the Inyo National Forest (USDA 2018). This Management Plan broadly describes Desired Conditions, Goals and Standards for protecting animal and plant species, but specific conservation measures for individual species are not identified. Therefore, such measures would be developed as part of this study if a special status plant is found to be potentially impacted by the Project.

2.3.4 STUDY AREA

The study area consists of the Project facilities including powerhouses, dams, diversions, valve houses and access roads including a 500-foot survey area buffer around each facility; this buffer will also encompass recreation facilities directly associated with the Project, as applicable. This survey area may be expanded depending on observations. The study area (Figure 2-3) includes lakes and streams within the Project boundaries, to the extent that some rare plant species are associated with mesic soils or aquatic habitats.

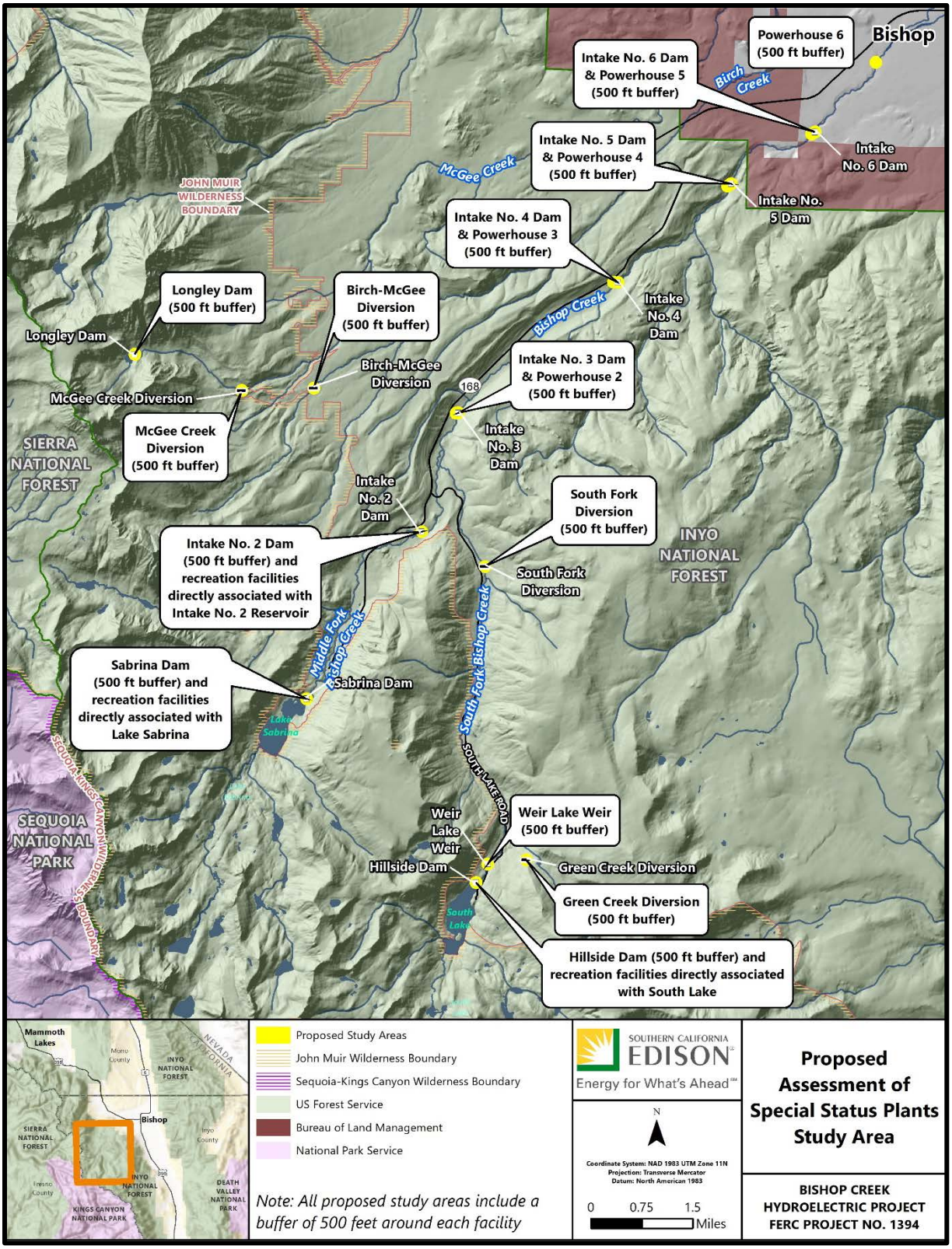

FIGURE 2-3 PROPOSED ASSESSMENT OF SPECIAL STATUS PLANTS STUDY AREA

2.3.5 METHODS

A preliminary list and map of occurrences was developed and presented to the resource agencies. These data will be supplemented with additional lists provided by CDFW and USFS. No change to Project operations is proposed but because some species were recognized as having special status after the existing license was issued, field surveys of facilities are proposed as part of the study. Survey results will be included in a protection plan, along with protocols for conducting additional pedestrian surveys, should a new disturbance be proposed during the new license.

Protocols for surveying the facilities as part of relicensing, and future surveys should they be required, are as follows. To ensure 100 percent visual coverage, surveys would be performed by qualified botanists walking the survey area. A list will be prepared of all plants observed during the surveys. Plants will be identified in the field to species or the lowest taxonomic category possible with formal identification completed in the office. Up to three pedestrian surveys will be conducted between March and November depending on weather, access and optimal time for detection. If a species is located in the Project area, resource agencies would be notified along with proposed avoidance/mitigation measures. If a Project task cannot be revised to avoid the species, mitigation measure(s) would be developed in consultation with these agencies to minimize impacts.

2.3.6 SCHEDULE, PERIODIC REPORTING AND ONGOING CONSULTATION

The anticipated Study Plan development and implementation schedule is identified in Table 2-9. As described in the PAD and NOI, SCE anticipates seeking an expedited Study Plan determination process for some plans or for portions of some.

TABLE 2-9 ANTICIPATED POST PAD/NOI STUDY PLAN DEVELOPMENT MILESTONES AND FERC PROCESS THROUGH STUDY PLAN DETERMINATION

TASK	RESPONSIBLE ENTITY	SCHEDULE MILESTONES
File NOI/PAD with FERC along with Proposed Study Plans	SCE	May 1, 2019
FERC Holds Scoping and Site Visit	FERC	July 1, 2019-July 31, 2019
Deadline for Comments on PAD and Study Requests	Stakeholders	Aug 30, 2019
Request for waiver of 18 CFR 5.12 & 5.13	SCE	Sep 2, 2019
Preliminary Field Season[1]	SCE	2019
Fall TWG Workshop	SCE & TWG	Nov 2019
FERC Director's Study Plan Determination (assumes waiver granted)	FERC	Nov 8, 2019
First Field Season	SCE	2019
Initial Study Report (adjust as necessary in consultation with TWGs)	SCE	Nov 9, 2020
Second Field Season (as necessary)	SCE	2020
Final Study Report	SCE	Nov 9, 2021
License Application	SCE	June 2022

[1] Note: Because the 2019 field season precedes the Study Plan Determination is noted as "preliminary" because to avoid confusion with the FERC sequence of field season followed by Initial Study Report. For similar reasons, a fall TWG workshop is offered to review the results of the preliminary field season

This schedule is predicated on attaining agency agreement on the general goals, objectives, and methods of the study, with the understanding that additional details may be worked out between the filing of the PAD and NOI, and the deadline for stakeholders to file comments on the PAD and make study requests. As well, there are additional decisions and ongoing consultation needs throughout the implementation of the study. For this plan, the outstanding items for consultation are listed in Table 2-10. This table distinguishes between those items that need resolution before the study can be implemented, and those that would be the subject of ongoing consultation with the appropriate TWG.

TABLE 2-10 ANTICIPATED ADDITIONAL CONSULTATION TASKS

IMPLEMENTATION DETAIL FOR RESOLUTION	SCHEDULE FOR RESOLUTION
Final edits and implementation details with USFS	June-July 2019
Field schedule and Implementation Plan	June-July 2019

2.3.7 STUDY PLAN CONSULTATION RECORD

This Study Plan was developed in consultation with the Bishop Creek Terrestrial and Botanical Resources TWG. The intent of the consultation process is to achieve consensus, to the degree possible, for 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 section summarizes the key consultation milestones for each Study Plan (Table 2-11), and how SCE addressed comments received through the consultation process. Table 2-12 is a Response to Comments Table for comments received from stakeholders, and how comments were addressed in the final Study Plan. Should stakeholder comment requests not be incorporated, Table 2-12 provides a rationale based on Project specific information and FERC's Study Plan Criteria (18 CFR § 5.9).

TABLE 2-11 KEY STUDY PLAN DEVELOPMENT MILESTONES AND TECHNICAL WORK GROUP PLANNING SCHEDULE

DELIVERABLE	MATERIAL DISTRIBUTED	MEETING TYPE	DATES	PROPOSED DATES FOR COMMENTS
Project Description	5/25/2018	TWG	6/4/2018, /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
Revised Study Plans	11/15/2018	TWG	12/4/2018 to 12/6/2018	1/7/2019
Proposed Study Plans (filed with PAD)	5/1/2019	TWG	6/12/2019 and 6/19/2019	7/12/2019

TABLE 2-12 SCE RESPONSES TO COMMENTS RECEIVED ON STUDY PLANS

COMMENT NO.	DATE OF COMMENT	ENTITY	COMMENT	SCE RESPONSE
1	8/31/2018	Tristan Leong, USFS	Consider renaming "Special Status" Plants Study since the USFS will no longer use the term "Sensitive" after USFS Plan is revised.	SCE will change the title of this plan and make future references consistent.
2	8/31/2018	Tristan Leong, USFS	Propose objective to classify and map the existing distribution of special status plants in the Project area and Project affected reaches.	SCE will add this proposed objective; special status aquatic plants will be included in this objective.
3	8/31/2018	Tristan Leong, USFS	Propose to remove objective for developing and management plans actions to address identified impacts.	SCE agrees that study's development of management plans and actions can be removed as an objective; however, it is important that information be collected in a manner and format to facilitate future decision-making.
4	8/31/2018	Tristan Leong, USFS	Study should include recreation sites and Project affected areas, which are being assessed for condition, accessibility, need for upgrades/aesthetics.	SCE has modified the study area to include recreation facilities as described in the Recreation Use and Needs study.
5	8/31/2018	Tristan Leong, USFS	Survey should be conducted to establish a baseline assessment – specifically a field survey of Project facilities and recreation sites to determine current distribution of special status plants in the Project area. Should utilize new forest plan list as this list includes greater number of target species than previously considered or surveyed.	See response to comment 4, above, and will use the new forest plan as guidance as proposed.

COMMENT NO.	DATE OF COMMENT	ENTITY	COMMENT	SCE RESPONSE
6	10/10/2018	LeeAnn Murphy, USFS (TWG Discussion)	USFS would like a baseline assessment of the vegetation community but that the level-of-specificity is up for discussion. For instance, it could take the form of a simple GIS exercise looking at how plant community types have shifted over the past decades and what might be due to Project impacts.	SCE agrees that existing vegetation layers for the area should be reviewed, and that this analysis can be included in the PAD, whereupon it can be determined if further information is needed to understand potential project impacts.
7	11/6/2018	Blake Engelhardt, USFS	Provided updated Table, titled *Listed and Other Special Status Plant Species Reported From the Bishop Project Region*	This list has been included as Appendix B to the Study Plan

2.3.8 REFERENCES

California Native Plant Society (CNPS). 2018. "CNPS Inventory of Rare Plants." https://www.cnps.org/rare-plants/cnps-inventory-of-rare-plants. Accessed March 21, 2019.

California Department of Fish and Wildlife (CDFW). 2018. California Natural Diversity Database (CNDDB). https://www.wildlife.ca.gov/data/cnddb. Accessed March 21, 2019.

United States Department of Agriculture (USDA). 2018. Land Management Plan for the Inyo National Forest. https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd589652.pdf. Accessed March 21, 2019.

2.4 WILDLIFE STUDY PLAN (TERR 4)

2.4.1 PROJECT NEXUS AND RATIONALE FOR STUDY

During the TWG meetings, stakeholders identified the need to conduct a Wildlife Study to determine if wildlife species are utilizing Project facilities for nesting, roosting, foraging or sheltering, and if so, how Project operations may affect these species. This Wildlife Study Plan details SCE's proposal for study objectives, study area, methods and schedule for the effort.

Wildlife occurrences within the vicinity of the Project's powerhouses and facilities have been documented by past studies (Psomas 2004a, 2004b, 2005, 2006a, 2006b, 2007a, 2007b, 2008a, 2008b, 2010, and 2014) and the Bishop Creek Project Environmental Assessment (EA) (FERC 1991). 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 wildlife presence in and around the Project and the Project vicinity to determine the effects of Project operations to wildlife in the context of the most recent USFS Management Plan, the federal and state Endangered Species Acts (ESA), the National Environmental Policy Act (NEPA), and the California Environmental Quality Act (CEQA).

2.4.2 STUDY GOALS AND OBJECTIVES

This Wildlife Study Plan identified the following goals and objectives:

- Determine if the resident mule deer (*Odocoileus hemionus*) herd and/or other wildlife species are affected by or alter their migratory patterns in response to Project infrastructure or operation and evaluate the use at existing crossing structures to determine adequacy.
- Identify management and other special status species from existing information and site-specific surveys that possess a high potential for occurrence in or utilize the Project's powerhouses, ancillary facilities, and operations areas for nesting, roosting, foraging, and sheltering during any portion of their life cycle. For those species with a high potential to occur or that have been determined to utilize the powerhouses or other Project facilities, determine time/season of usage at those locations.
- Special status species are defined as wildlife species listed as endangered or threatened under the federal and state ESAs by USFWS and CDFW or species which have been determined to be sensitive or of special concern because of declining populations or rarity in the Project area by the USFS, BLM or CDFW.

- For those special status species with high potential of utilization, or have been determined to be present, assess potential for Project impact. Identify the potential effects of continued Project operations on the habitats and associated wildlife within the Wildlife Study Plan Area.
- Provide Resource Management Plans and Guidelines so that future Project facilities and operations are consistent with the Desired Conditions described in the Land Management Plan for the Inyo National Forest (USDA 2018) as they relate to ecological sustainability and diversity of plant and animal communities.

2.4.3 REVIEW OF EXISTING INFORMATION

A review of the existing literature was conducted to determine the potential for special status wildlife species to occur in the Project vicinity. This review included previous biological reports prepared for individual projects within the Wildlife Study Plan Survey Area (Psomas 2004a, 2004b, 2005, 2006a, 2006b, 2007a, 2007b, 2008a, 2008b, 2010, and 2014) and the EA for the Bishop Creek Project (FERC 1991). To obtain information on known special status wildlife species reported to occur in the Project vicinity, the CDFW's CNDDB (CDFW 2018a) was queried for special status wildlife species for the following U.S. Geological Survey (USGS) 7.5-minute topographic quadrangles: Coyote Flat, North Palisade, Tungsten Hills, Mt. Darwin, Mount Tom, Bishop and Mt. Goddard. Additional literature reviewed includes the USFWS Information for Planning and Consultation System (IPaC) website (USFWS 2018); USFWS' Seven-Year Work Plan September 2016 Version (USFWS 2016b); the Five Year Work Plan May 2019 Version (USFWS 2019); USFWS Unscheduled Listing Actions September 2016 version (USFWS 2016b); List of USFS Management Indictor Species (USFS 2018a); and a list of potentially occurring threatened and endangered and other sensitive species potentially occurring in the Wildlife Study Plan Survey Area (USFS 2018b).

Other sources reviewed included: eBird database for observations within the Project area including South Lake, Lake Sabrina, North Lake, Intake No 2, Bishop Plant 4 and Aspendell; Sierra Nevada yellow-legged frog (SNYLF) and mountain yellow-legged frog (MYLF) (northern distinct population segment [DPS]) Field Season 2017 (CDFW 2018b); 2014 Owens Basin southwestern willow flycatcher survey results (CDFW 2014; USFWS 2015), yellow-billed cuckoo, and Bell's vireo surveys in Inyo and Mono Counties (Greene 2015); Sierra Nevada Yellow-legged Frog Critical Habitat Final Rule (USFWS 2016c); Sierra Nevada Bighorn Sheep Critical Habitat Final Rule (USFWS 2008); March-June 2018 Sierra Nevada Bighorn Sheep

Location Maps (USFS 2018c, personal communication); the Butterfly Reference Document for the Inyo, Sequoia, and Sierra National Forests USFS Region 5 (USFS 2015); Verner (1980) for coniferous bird communities; and Morrison (2018), Anderson et al. (2018), Pierson and Rainey (1998), Weller et al. (2018) for Townsend's big-eared bat, and Long and Weller (2018) for other bat species in the Project area.

As a result of the above literature review, it was determined that three wildlife species designated as threatened or endangered by the USFWS or CDFW were reported as occurring within the Wildlife Study Plan Survey Area, and another three wildlife species designated as threatened or endangered by the USFWS or CDFW were determined to may have the potential to occur within the Wildlife Study Plan Survey Area (Table 2-13). Five wildlife species designated as threatened or endangered by the USFWS or CDFW were determined unlikely to occur within the Wildlife Study Plan Area. As a result of the above literature review, it was determined that one sensitive species was reported as occurring within the Wildlife Study Plan Survey Area, and another five wildlife species designated as sensitive were determined to may occur within the Wildlife Study Plan Survey Area (Table 2-14).

TABLE 2-13 ENDANGERED, THREATENED, OR FULLY PROTECTED SPECIES POTENTIAL

SCIENTIFIC/ COMMON NAME	FEDERAL STATUS	STATE STATUS	HABITAT	LIKELIHOOD FOR OCCURRENCE/ OCCURRENCE NOTES
KNOWN TO OCCUR IN THE PROJECT VICINITY				
Haliaeetus leucocephalus bald eagle	USFS_S	Endangered CDFW__FP	Requires large bodies of water, or free flowing rivers with abundant fish, and adjacent snags or other perches and nesting sites to support them. Perching sites need to be composed of large trees or snags with heavy limbs or broken tops. It roosts communally in winter in dense, sheltered, remote conifer stands. Breeding habitat in California is primarily in mountain and foothill forests and woodlands near reservoirs, lakes, and rivers.	Expected to occur for foraging and wintering; mainly expected to occur as a vagrant but not expected to occur for nesting. eBird* reports a recent sighting (2018) at Lake Sabrina. No occurrences of bald eagle were documented in the CNDDB search for the Project vicinity.
Aquila chrysaetos golden eagle	--	CDFW__FP, CDFW__WL	Golden eagles occur locally in open country such as open coniferous forest, sage-juniper flats, desert, and barren areas, especially in rolling foothills and mountainous regions. Within southern California, the species favors grasslands, brushlands, deserts, oak savannas, open coniferous forests, and montane valleys. Nesting is primarily restricted to rugged, mountainous country. Cliff-walled canyons provide nesting habitat in most parts of range; also, large trees in open areas.	Expected to occur for foraging and wintering; mainly expected to occur as a vagrant but not expected to occur for nesting. eBird reports recent sightings (2018) at Aspendell, Intake No 2 and South Lake, North Lake, and Lake Sabrina. No occurrences of golden eagle were documented in the CNDDB search for the Project vicinity.
Empidonax traillii willow flycatcher	USFS_S	Endangered	In general, prefers moist, shrubby areas, often with standing or running water; e.g., in California, restricted to thickets of willows, whether along streams in broad valleys, in canyon bottoms, around mountain-side seepages, or at the margins of ponds and lakes. In the West, generally occurs in beaver meadows, along borders of clearings, in brushy lowlands, in mountain parks, or along watercourses to 7,500 feet.	Expected to occur for foraging; mainly expected to occur as a migrant but not expected to occur for nesting. eBird reported observation at Aspendell, Lake Sabrina, South Lake, and North Lake; suitable habitat. Please note that eBird does not distinguish between northern subspecies of willow flycatcher and southwestern willow flycatcher. No occurrences of willow flycatcher were documented in the CNDDB search for the Project vicinity.
Empidonax traillii extimus southwestern willow flycatcher	Endangered	Endangered	Occurs in riparian woodlands in Southern California. Willow-dominated riparian habitats that are similar to least Bell's vireo nesting habitats; shows a stronger preference for sites with surface water in the vicinity, such as along streams, on the margins of a pond or lake, and at wet mountain meadows.	Expected to occur for foraging; mainly expected to occur as a migrant but not expected to occur for nesting. eBird reported observation at Aspendell, Lake Sabrina, South Lake, and North Lake; suitable habitat. Please note that eBird does not distinguish between northern subspecies of willow flycatcher and southwestern willow flycatcher. No occurrences of southwestern willow flycatcher were documented in the CNDDB search for the Project vicinity.
MAY POTENTIALLY OCCUR IN THE PROJECT VICINITY				
Siphateles bicolor snyderi Owens-tui chub	Endangered	Endangered	Needs clear, clean water, adequate cover, and aquatic vegetation within a variety of habitats, including Great Basin flowing water and Great Basin standing water within the Owens River basin; at elevations above 4,000 feet.	May potentially occur. Reported from 4.4 miles northeast of Powerhouse No. 6, located along North Fork Bishop Creek near Hwy 6 north of Bishop, northeast of the Project watershed northeastern most boundary.

SCIENTIFIC/ COMMON NAME	FEDERAL STATUS	STATE STATUS	HABITAT	LIKELIHOOD FOR OCCURRENCE/ OCCURRENCE NOTES
Vulpes vulpes necator Sierra Nevada red fox	Candidate, USFS_S	Threatened	Uses dense vegetation and rocky areas for cover and den sites. Found in a variety of habitats, including alpine, alpine dwarf scrub, broadleaved upland forest, meadow and seep, riparian scrub, subalpine coniferous forest, upper montane coniferous forest, and wetland; at elevations above 2,500 feet.	May potentially occur; reported from 3.8 miles northeast of Powerhouse No. 6, located in Bishop, northeast of the Project watershed northeastern most boundary; last seen in 1922.
Ovis canadensis sierrae Sierra Nevada bighorn sheep	**Endangered**	Endangered, CDFW__FP	Available water and steep, open terrain free of competition from other grazing ungulates within alpine, alpine dwarf scrub, chaparral, chenopod scrub, Great Basin scrub, Mojavean desert scrub, montane dwarf scrub, pinon and juniper woodlands, riparian woodland, and Sonoran Desert scrub habitats, from 5,000 to 9,000 feet during the winter and 10,000 to 14,000 feet during summer.	May potentially occur. Reported from 12.9 miles northwest of Powerhouse No. 6, located at Wheeler Crest (aka Wheeler Ridge), 10 miles northwest of Bishop, 12.9 miles northwest of the Project watershed northern boundary.
UNLIKELY TO OCCUR IN THE PROJECT VICINITY				
Oncorhynchus clarkii seleniris Paiute cutthroat trout	Threatened	–	Cannot tolerate presence of other salmonids. Requires clean gravel for spawning and cool, well-oxygenated waters in Great Basin flowing water habitat, at elevations up to 10,000 feet.	Unlikely to occur. Reported 6.2 miles northwest of Longley Lake Dam/McGee Lake, located in Birchim Lake in the headwaters of Pine Creek 5.4 miles northwest of the Project watershed northwestern boundary. Determined to be not true Paiute cutthroat trout by CDFW (CDFW 2018a).
Rana muscosa southern mountain yellow-legged frog	Endangered	Endangered	Highly aquatic and rarely found more than 3.3 feet from water. They can be found sitting on rocks along the shoreline where there may be little or no vegetation. These species historically inhabited lakes, ponds, marshes, meadows, and streams at elevations typically ranging from approximately 4,500 to 12,000 feet.	Unlikely to occur. No recorded occurrences in Inyo County.
Rana sierrae Sierra Nevada yellow-legged frog	Endangered, USFS_S	Threatened,	Always encountered within a few feet of water. Tadpoles may require 2 to 4 years to complete their aquatic development. Found in streams, lakes, and ponds in montane riparian and a variety of other habitats from 4,495 to 11,975 feet.	Unlikely to occur. Reported from South Fork Bishop Creek, 2.1 miles south of Bishop Creek South Fork Diversion Dam; Wonder Lake, 2.3 mi northwest of Sabrina Lake; Treasure Lakes 3,4,5,6, and 7; 1.6 miles west of north end of South Lake. Populations along Bishop Creek are considered extirpated by CDFW.
Anaxyrus canorus Yosemite toad	Threatened USFS_S	CDFW _SSC	Primarily montane wet meadows; also, in seasonal ponds associated with lodgepole pine and subalpine conifer forest within meadow and seep, subalpine coniferous forest, and wetland habitat, from 6,400 to 11,300 feet.	Unlikely to occur. Reported from 5.5 miles southwest of Sabrina Lake Dam, located 1.2 miles southwest of Project watershed western boundary.

SCIENTIFIC/ COMMON NAME	FEDERAL STATUS	STATE STATUS	HABITAT	LIKELIHOOD FOR OCCURRENCE/ OCCURRENCE NOTES
Gulo gulo California wolverine	Proposed Threatened, USFS_S	Threatened, CDFW__FP	Needs water source. Uses caves, logs, burrows for cover and den area. Hunts in more open areas. Can travel long distances. Found in the north coast mountains and the Sierra Nevada. Found in a wide variety of high elevation habitats, including alpine, meadow and seep, north coast coniferous forest, riparian forest, subalpine coniferous forest, upper montane coniferous forest, and wetland from 1,640 to 4,921 feet.	Unlikely to occur. Reported from 0.38 mile south of South Lake Dam, located along the east side of South Lake; however, it is considered extirpated from Project area by CDFW (personal communication).

* https://ebird.org/region/US-CA-027
USFS: BLM: CDFW: CDF: California Department of Forestry and Fire Protection
LEGEND:

USFWS:
S: Sensitive
USFS
FFS Sensitive
BLM
S Sensitive
CDFW
FP Fully Protected
SSC Species of Special Concern
WL Watch List

TABLE 2-14 SENSITIVE SPECIES POTENTIAL

SCIENTIFIC/ COMMON NAME	FEDERAL STATUS	STATE STATUS	HABITAT	LIKELIHOOD FOR OCCURRENCE/OCCURRENCE NOTES
KNOWN TO OCCUR IN THE PROJECT VICINITY				
Accipiter gentilis northern goshawk	USFS_S, BLM_S	CDFW_SSC	Usually nests on north slopes, near water. Red fir, lodgepole pine, Jeffrey pine, and aspens are typical nest trees within north coast coniferous forest, subalpine coniferous forest, and upper montane coniferous forest habitats from 915 to 9,900 feet.	Known to occur. This species has been recorded 0.18 mile north of Birch Creek Diversion, near Birch Creek; and 0.75 mile south of South Lake Dam on the east side of South Lake.
MAY POTENTIALLY OCCUR IN THE PROJECT VICINITY				
Corynorhinus townsendii Townsend's big-eared bat	USFS_S, BLM_S	CDFW_SSC	Roosts in the open, hanging from walls and ceilings throughout California in a wide variety of habitats, including chaparral, chenopod scrub, Great Basin grassland, Great Basin scrub, upper and lower montane coniferous forest, meadow and seep, riparian forest/woodland, and valley and foothill grassland. Most common in mesic sites. Roosting sites limiting. Extremely sensitive to human disturbance. Found from 4,000 to 10,800 feet.	May potentially occur. This species has been recorded at Yaney Mine, approximately 1.1. miles east of the Project watershed's eastern boundary, 1.6 miles northeast of Powerhouse No. 5 and Intake 6.
Euderma maculatum spotted bat	BLM_S	CDFW_SSC	Feeds over water and along washes. Feeds almost entirely on moths. Needs rock crevices in cliffs or caves for roosting within wide variety of habitats from arid deserts and grasslands through mixed conifer forests from mostly 900 to 2,700 feet but up to 9,700 feet.	May potentially occur. This species has been recorded 1.5 miles northeast of Powerhouse No. 6, located in a residential area between Highway 395 and Highway 168, northeast of the Project watershed northeastern most boundary.
Lepus townsendii western white-tailed jackrabbit	–	CDFW_SSC	Open areas with scattered shrubs and exposed flat-topped hills with open stands of trees, brush and herbaceous understory within sagebrush, subalpine conifer, juniper, alpine dwarf shrub, and perennial grassland habitats, from 120 to 12,000 feet.	May potentially occur. This species has been recorded north of Bishop, northeast of the Project watershed's northeastern most boundary, 4.5 miles northeast of Powerhouse No. 6 along North Fork Bishop Creek near Highway 6.
Lithobates pipiens northern leopard frog	–	CDFW_SSC	Highly aquatic species. Shoreline cover submerged, and emergent aquatic vegetation are important habitat characteristics within freshwater marsh, Great Basin flowing waters, Great Basin standing waters, marsh and swamp, wetland habitats, from sea level to 7,000 feet.	May potentially occur. This species has been recorded northwest of the Project watershed's northernmost boundary, 1.7 miles northwest of Powerhouse No. 6, 0.4 mile east of Birch Creek, 4 miles west of Bishop. Species analyzed in Aquatic Resources Section.
Martes caurina sierrae Sierra marten	USFS_S	–	Needs variety of different-aged stands, particularly old-growth conifers and snags which provide cavities for dens/nests, within mixed evergreen forests with more than 40% crown closure along Sierra Nevada and Cascade Mountains, from 8,000 to 10,300 feet.	May potentially occur. This species has been recorded 2.7 miles southwest of Sabrina Lake Dam, along Middle Fork Bishop Creek just south of Dingleberry Lake.

USFS: BLM: CDFW: CDF: California Department of Forestry and Fire Protection
LEGEND:

USFWS:
S: Sensitive
USFS
S Sensitive
BLM
S Sensitive
CDFW
SSC Species of Special Concern

In addition, the USFS provided a list of Sierra Forest Management Indicator Species (MIS) (Table 2-15).

TABLE 2-15 SIERRA FOREST MANAGEMENT INDICATOR SPECIES

Habitat or Ecosystem Component	CWHR Type(s) Defining the Habitat or Ecosystem Component[1]	Sierra Nevada Forests Management Indicator Species Scientific Name	Category for Project Analysis[2]
Riverine and Lacustrine	Lacustrine (LAC) and riverine (RIV)	aquatic macroinvertebrates	2
Shrubland (west-slope chaparral types)	Montane chaparral (MCP) Mixed chaparral (MCH) Chamise-redshank chaparral (CRC)	fox sparrow (*Passerella iliaca*)	2
Oak-associated Hardwood and Hardwood/Conifer	Montane hardwood (MHW) Montane hardwood-conifer (MHC)	mule deer (*Odocoileus hemionus*)	2
Riparian	Montane riparian (MRI) Valley foothill riparian (VRI)	yellow warbler (*Dendroica petechial*)	2
Wet Meadow	Wet meadow (WTM) Freshwater emergent wetland (FEW)	Pacific tree frog (*Pseudacris regilla*)	2
Early Seral Coniferous Forest	Ponderosa pine (PPN) Sierran mixed conifer (SMC) White fir (WFR) Red fir (RFR) Eastside pine (EPN) Tree sizes 1, 2, and 3 All canopy closures	mountain quail (*Oreortyx pictus*)	2
Mid Seral Coniferous Forest	Ponderosa pine (PPN) Sierran mixed conifer (SMC) White fir (WFR), red fir (RFR) Eastside pine (EPN) Tree size 4 All canopy closures	mountain quail (*Oreortyx pictus*)	
Late Seral Open Canopy Coniferous Forest	Ponderosa pine (PPN) Sierran mixed conifer (SMC) White fir (WFR) Red fir (RFR) Eastside pine (EPN) Tree size 5 Canopy closures S and P	sooty (blue) grouse (*Dendragapus obscurus*)	1
Late Seral Closed Canopy Coniferous Forest	Ponderosa pine (PPN) Sierran mixed conifer (SMC) White fir (WFR) Red fir (RFR) Tree size 5 (canopy closures M and D) Tree size 6	California spotted owl (*Strix occidentalis occidentalis*) American marten (*Martes americana*) northern flying squirrel (*Glaucomys sabrinus*)	2
Snags in Green Forest	Medium and large snags in green forest	hairy woodpecker (*Picoides villosus*)	2
Snags in Burned Forest	Medium and large snags in burned forest (stand-replacing fire)	black-backed woodpecker (*Picoides arcticus*)	2

1

All CWHR size classes and canopy closures are included unless otherwise specified; **dbh** = diameter at breast height; **Canopy Closure classifications:** S=Sparse Cover (10-24% canopy closure); P= Open cover (25-39% canopy closure); M= Moderate cover (40-59% canopy closure); D= Dense cover (60-100% canopy closure); **Tree size classes:** 1 (Seedling)(<1" dbh); 2 (Sapling)(1"-5.9" dbh); 3 (Pole)(6"-10.9" dbh); 4 (Small tree)(11"-23.9" dbh); 5 (Medium/Large tree)(≥24" dbh); 6 (Multi-layered Tree) [In PPN and SMC] (Mayer and Laudenslayer 1988).

2

Category 1: MIS whose habitat is not in or adjacent to the Project area and would not be affected by the Project.
Category 2: MIS whose habitat is in or adjacent to Project area but would not be either directly or indirectly affected by the Project.
Category 3: MIS whose habitat would be either directly or indirectly affected by the Project.

The review of USFWS IPaC website (USFWS 2018) also provided a list of Bird Species of Conservation Concern (Table 2-16).

TABLE 2-16 USFWS BIRD SPECIES OF CONSERVATION CONCERN

SPECIES	BREEDING SEASON	HABITAT	POTENTIAL TO OCCUR
black rosy-finch *Leucosticte atrata*	Jun 15 to Aug 31	Above timberline throughout its range, wherever proper cliffs and rock slides provide nest sites with protection from falling rocks and hail and where adequate feeding grounds occur on tundra, fellfields, rock slides, snowfields, and glaciers within commuting distance. May occur in enclaves of alpine habitat on northeast faces of mountains whose summits are below timberline, but where cliffs, shade, and snow produce alpine climate.	eBird* reported observation at Aspendell; suitable habitat.
Brewer's sparrow *Spizella breweri*	May 15 to Aug 10	Breeds in shrublands; most closely associated with landscapes dominated by big sagebrush (*Artemisia tridentata*). Overwinters in sagebrush shrublands and brushy desert habitat, including desert scrub dominated by various saltbush species (*Atriplex* spp.) and creosote (*Larrea tridentata*).	eBird reported observation at Aspendell, Intake 2, Lake Sabrina, South Lake, and North Lake; suitable habitat.
Cassin's finch *Carpodacus cassinii*	May 15 to Jul 15	Generally open coniferous forests of interior western mountains over a broad elevational range. Often found in mature forests of lodgepole pine (*Pinus contorta*) and ponderosa pine (*P. ponderosa*)	eBird reported observation at Intake 4, Aspendell, Intake 2, Lake Sabrina, South Lake, and North Lake; suitable habitat.
green-tailed towhee *Pipilo chlorurus*	May 1 to Aug 10	Habitat varies with elevation. Dry shrubby hillsides (shrub-steppe) and post-disturbance shrubby second growth are most commonly used. Vegetation may be characterized as low brush cover, often interspersed with trees; avoids typical forest.	eBird reported observation at Aspendell, Intake 2, Lake Sabrina, South Lake, and North Lake; suitable habitat.
lesser yellowlegs *Tringa flavipes*	Breeds elsewhere	Common breeder in boreal forest (generally open forest) and forest/tundra transition habitats; less abundant in adjacent subarctic tundra. Also nests in man-made habitats such as seismic and gas line right-of-ways, road allowances, and mine clearings. Typical foraging areas are located along the shores of large, shallow, freshwater lakes and sloughs (interior breeders) or in brackish portions of salt marshes (coastal breeders).	Not expected to occur for breeding; no potentially suitable breeding habitat; may occur as a migrant.
Lewis's woodpecker *Melanerpes lewis*	Apr 20 to Sep 30	Important aspects of breeding habitat include an open canopy, a brushy understory offering ground cover, dead or downed woody material, available perches, and abundant insects. Three principal habitats are open ponderosa pine forest, open riparian woodland dominated by cottonwood, and logged or burned pine (*Pinus* spp.) forest; also found in oak (*Quercus* spp.) woodland, nut and fruit orchards, piñon pine–juniper (*Pinus cembroides – Juniperus* spp.) woodland, a variety of pine and fir (*Abies* spp.) forests, and agricultural areas including farm- and ranchland. Often classified as a specialist in burned pine forest habitat.	eBird reported observation at Aspendell; suitable habitat.
long-billed curlew *Numenius americanus*	Apr 1 to Jul 31	Nests primarily in short-grass or mixed-prairie habitat with flat to rolling topography. Wide range of habitats used during migration, including dry short-grass prairie, wetlands associated with alkali lakes, playa lakes, wet coastal pasture, tidal mudflats, salt marsh, alfalfa fields, barley fields, fallow agriculture fields, and harvested rice fields. Overwinters in tidal estuaries, wet pasture habitats, and sandy beaches.	Not expected to occur for breeding; no potentially suitable breeding habitat; may occur as a migrant
marbled godwit *Limosa fedoa*	Breeds elsewhere	In northern prairies of Canada and U.S., breeds in short, sparsely to moderately vegetated landscapes that include native grassland and wetland complexes with a variety of wetland classes (ephemeral to semi-permanent). Away from breeding areas, most migrants found in flocks at coastal estuaries, mudflats, salt marshes, lagoons, and sandy beaches. Habitats used by birds in winter like those of coastal migrants: coastal mudflats adjoining savannas or meadows, estuaries, sandy beaches, and sandflats; sometimes roosting at salt ponds.	Not expected to occur for breeding; no potentially suitable breeding habitat; may occur as a migrant
olive-sided flycatcher	May 20 to Aug 31	Primarily montane and northern coniferous forests. May occur at any elevation from sea level to timberline, but usually at mid- to high-elevation forest (920–2,130 m). Within the coniferous forest biome, most often	eBird reported observation at Aspendell, Intake 2,

SPECIES	BREEDING SEASON	HABITAT	POTENTIAL TO OCCUR
Contopus cooperi		associated with forest openings, forest edges near natural openings (e.g., meadows, canyons, rivers) or human-made openings (e.g., harvest units), or open to semi-open forest stands. Frequently occurs along wooded shores of streams, lakes, rivers, beaver (*Castor canadensis*) ponds, bogs, and muskegs, where natural edge habitat occurs and standing dead trees often are present.	Lake Sabrina, South Lake, and North Lake; suitable habitat.
pinyon jay *Gymnorhinus cyanocephalus*	Feb 15 to Jul 15	Piñon-juniper woodland is used most extensively but flocks also breed in sagebrush (*Artemisia* spp.), scrub oak (*Quercus* spp.) and chaparral communities. In parts of its range (central Arizona, southern California), inhabits ponderosa and Jeffrey pine (*Pinus jeffreyi*) forests.	eBird reported observation at Intake 4, Aspendell, and Intake 2; suitable habitat.
rufous hummingbird *Selasphorus rufus*	Breeds elsewhere	Breeds in dense mature and second growth coniferous forests, deciduous woods, riparian thickets, swamps and meadows, farmland, pasture edges, orchards and city yards, parks, and gardens; in the Pacific Northwest U.S. and Canada. Migrants utilize montane meadows; alpine meadows in the Sierras as high as 12,598 feet. Overwinters in Mexico.	eBird reported observation at Aspendell, Intake 2, Lake Sabrina, South Lake, and North Lake; suitable habitat.
sage thrasher *Oreoscoptes montanus*	Apr 15 to Aug 10	Shrub-steppe dominated by big sagebrush (*Artemisia tridentata*). Considered a sagebrush obligate but noted in black greasewood (*Sarcobatus vermiculatus*) habitat in Utah and Nevada and bitterbrush (*Purshia tridentata*) habitat in Washington. Migrants utilize sagebrush plains, arid shrub, grassland with scattered bushes, and open piñon-juniper woodland, primarily in arid or semiarid situations; rarely around towns. Overwinter in arid to semiarid, open and semi-open country with scrub, scattered bushes, and sagebrush.	eBird reported observation 0.85-mile northeast of Powerhouse No. 3; suitable habitat.
sagebrush sparrow *Artemisiospiza nevadensis*	Mar 15 to Jul 31	Prefers semi-open habitats with evenly spaced shrubs 3 to 6 feet high. Vertical structure, habitat patchiness, and vegetation density may be more important in habitat selection than specific shrub species, but this sparrow is closely associated with big sagebrush throughout most of its range. observed in creosote bush, low desert scrub, and coastal sagebrush scrub during migration. In northern portions of its range, favors big sagebrush. Farther south, fairly common to uncommon during winter in desert washes, big sagebrush, creosote bush, sparse cactus scrub, arid grasslands, and arboreal yucca (*Yucca* spp.) mixed with greasewood	eBird reported observation at Intake 4, and Intake 2; suitable habitat.
Virginia warbler *Vermivora virginiae*	May 1 to Jul 31	Over most of its range, typically found breeding in piñon-juniper and oak woodlands. May also occur in high-altitude life zones dominated by large conifers but tends to select patches of shrubby vegetation for breeding; never occurs in coniferous forests where there is not a deciduous mix (CRO). Strong association for breeding in steep draws, drainages, or slopes with oak or other shrubby vegetation.	eBird reported observation at Aspendell and South Lake; suitable habitat.
white-headed woodpecker *Picoides albolarvatus*	May 1 to Aug 15	Requires montane coniferous forests dominated by pines (*Pinus* ssp.), with tree species composition varying geographically. Within the Sierra Nevada, occupies mixed coniferous forest of ponderosa and sugar pines, white fir, red fir (*Abies magnifica*), Douglas-fir, and black oak (*Quercus kelloggii*); occurs more locally on drier east-slope forests dominated by Jeffrey pine (*P. jeffreyi*) and in high-elevation lodgepole pine and western white pine (*P. monticola*) forests, and is generally absent from digger pine (*P. sabiniana*)-dominated habitats at lower elevations on western flank of the Sierra Nevada.	eBird reported observation at Aspendell, Intake 2, Lake Sabrina, and South Lake; suitable habitat.
willet *Tringa semipalmata*	Apr 20 to Aug 5	On the prairies, uses short, sparse cover in wetlands and grasslands. Breeds on semiarid plains near bodies of water (eastern Oregon), in grasslands associated with shallow wetlands (southern Alberta), in native grasslands and to a lesser extent cropland (N. Dakota), in uplands near brackish or saline wetlands, and less frequently on alkali flats (Utah) and lakes in forested mountain areas. During nonbreeding season, found in diverse California coastal types: mudflat, marsh, sandy beach, and rocky coast.	Not expected to occur for breeding; no potentially suitable breeding habitat; may occur as a migrant
Williamson's sapsucker *Sphyrapicus thyroideus*	May 1 to Jul 31	Throughout range, breeds in middle to high elevation conifer and mixed conifer-deciduous forests. Common in montane western larch, Douglas fir (*Pseudotsuga menziesii*), ponderosa pine, and pine-fir forests.	eBird reported observation at Aspendell, Lake Sabrina, South Lake, and North Lake; suitable habitat.
willow flycatcher *Empidonax traillii*	May 20 to Aug 31	In general, prefers moist, shrubby areas, often with standing or running water; e.g., in California, restricted to thickets of willows, whether along streams in broad valleys, in canyon bottoms, around mountain-side seepages, or at the margins of ponds and lakes. in the West, generally occurs in beaver	eBird reported observation at Aspendell, Lake Sabrina, South Lake, and North Lake; suitable habitat.

SPECIES	BREEDING SEASON	HABITAT	POTENTIAL TO OCCUR
		meadows, along borders of clearings, in brushy lowlands, in mountain parks, or along watercourses to 7,500 feet.	
* https://ebird.org/region/US-CA-027			

A review of the USFWS' 5 Year Work Plan (USFWS 2019) provided a list of 27 wildlife species in California that are under consideration for the potential to receive federal protection by listing as threatened or endangered pursuant to the federal ESA. Of these 27 species, two species were determined to have the potential to be present in the Project's Wildlife Study Area: Oregon vesper sparrow (*Pooecetes gramineus affinis*), and the little brown bat (*Myotis lucifugus*).

2.4.4 STUDY AREA

The Wildlife Study Plan Survey Area (Figure 2-4) consists of Project facilities including powerhouses, dams, diversions, lakes and other impoundments, the flowline starting at Intake No. 2, valve houses, other outbuildings, and access roads. The Wildlife Study Plan Survey Area includes a 500-foot survey area buffer surrounding each of the above listed Project components. Note: only those areas of lakes and other impoundments within 500 feet of a Project facility will be surveyed.

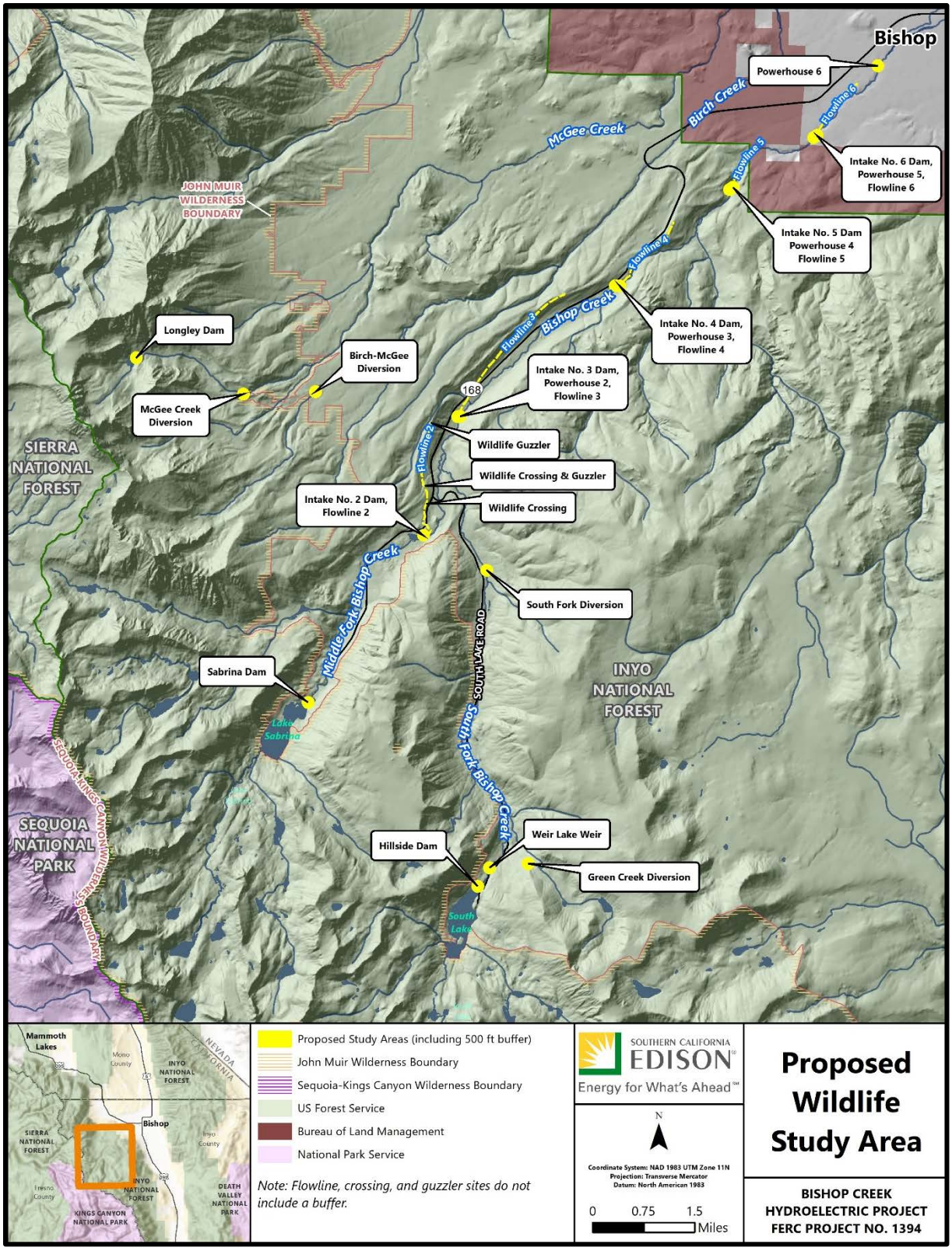

FIGURE 2-4 PROPOSED WILDLIFE STUDY AREA

2.4.5 METHODS

2.4.5.1 LITERATURE REVIEW

Prior to the initiation of field surveys, a new literature review will be conducted to determine if any additional special status wildlife species have been identified as having the potential to occur within the Wildlife Study Plan Survey Area or in the immediate vicinity. The new literature review will also determine if the protective status of any of the previously identified special status species has changed and will also identify any new literature on the ecology and life history of special status wildlife species. The literature review will be used to determine habitat preferences for those species listed in Table 2-13 through Table 2-16. Sources to be reviewed are included in the Review of Existing Information section. Databases, such as the CNDDB, will be queried prior to field surveys for new occurrence records of existing species, identification of new species not previously recorded, and changes in legal status of species.

2.4.5.2 2019 FIELD SURVEYS

Biologists will perform a pedestrian survey at each of the Project's facilities in the summer of 2019. The survey at each facility will include a 500-foot buffer around each facility to include a diversity of habitats (including uplands, riparian, and wetlands), identify and map existing conditions, document existing wildlife, and identify potentially suitable habitat (i.e., preferred plant associations and habitat structure) for special status species determined to have the potential to occur at each facility based on the literature review and agency consultation. Prior to the start of the surveys, aerial photographs of each facility at a 1-inch to 200-foot scale will be prepared for field use to map existing features and note wildlife occurrences and areas of potentially suitable habitat.

2.4.5.3 GENERAL WILDLIFE

Pedestrian surveys will be performed by biologists walking the Wildlife Study Plan Survey Area for 100 percent visual coverage. Binoculars will be used to directly observe wildlife. Active searches for reptiles and amphibians will include lifting, overturning, and carefully replacing objects such as rocks, boards, and debris. Mammals will be identified by visual recognition or evidence of diagnostic sign, including scat, footprints, scratch-outs, dust bowls, burrows and trails. All wildlife species observed will be recorded in field notes of species (if possible) and

location. Nesting behavior of birds and raptors will be noted by species and the locations of active or potential nests recorded with a hand-held global positioning system (GPS) unit. Breeding behavior of birds observed, as well as birds in breeding plumage will be noted, including the location of the observation. If possible, nests will be located and mapped on an aerial photograph and nest location documented using a hand-held GPS. Observations of active or abandoned raptor nests will also be recorded using a hand-held GPS unit.

2.4.5.4 WILLOW FLYCATCHER NESTING HABITAT ASSESSMENT

Suitable nesting habitat for willow-flycatcher, as defined by the USFS, will be assessed during general wildlife surveys. Suitable willow flycatcher habitat in the INF is defined as, "Meadows greater than 15 acres in size with water present and a woody riparian shrub component greater than 6.5 feet in height." Patches of habitat meeting this description at or within 500 feet of Project facilities will be mapped as potentially suitable nesting willow flycatcher habitat in the field and documented using a hand-held GPS unit.

2.4.5.5 MANAGEMENT INDICATOR SPECIES

USFS MIS observed will be counted and recorded at each location observed. Observations of special status and MIS wildlife species will be documented by marking the location with a hand-held GPS.

2.4.5.6 MULE DEER

Psomas biologists will perform pedestrian surveys along the length of the flowline. Biologists will record signs of mule deer use along the flow line road (i.e., scat and tracks, or direct observations) at each of the two deer crossings and at the wildlife guzzlers described in this Wildlife Study Plan. Mule deer and their sign will be documented during the other surveys for wildlife. Biologists will document the locations of mule deer trails along the flowline with photographs with locations documented by hand-held GPS. Other wildlife identified by observation or tracks using the mule deer crossings will be identified to the lowest taxonomic rank possible in the field, and tracks and signs documented with photographs. Should pedestrian survey prove inconclusive, trail cameras will be installed along the flowline and at the existing deer crossings to document wildlife use. Data from the trail cameras will be downloaded weekly by SCE operations personnel and transmitted to Psomas for analysis.

2.4.6 2020 FIELD SURVEYS

2.4.6.1 NORTHERN GOSHAWK

USDA protocol surveys for Northern goshawk (Woodbridge and Hargis 2006) will be scheduled in coordination with the USFS at Project facilities where potentially suitable forested habitat exists (e.g., Green and South lakes). Dawn surveys would include access roads, routes and trails within 500 feet of Project facilities. Based on dawn results, intensive surveys may require nest searches adjacent but outside the Project boundary because the habitat surrounding Project facilities may provide foraging habitat, while the adjacent forest may provide nesting and roosting habitat. The CNDDB (CDFW 2018a) reported three occurrences in the Project vicinity, North Lake, Birch Creek and South Lake.

2.4.6.2 2019 REPORTING

A Technical Memorandum will be prepared following the 2019 field surveys. The Technical Memorandum will include an introduction, purpose and need, brief Project description, exiting conditions, methods (including maps of survey locations), and a results section with locations and descriptions of all special status wildlife species observed and an analysis of the potential of special status species to occur if not observed based on the observed habitat. The Technical Memorandum will identify any wildlife resource issues, should any exist and provide recommendations for those surveys to be conducted in 2020.

2.4.6.3 2020 REPORTING

A Letter Report will be prepared documenting the findings of the 2019-2020 wildlife surveys. The Letter Report will include an introduction, purpose and need, brief Project description, exiting conditions, methods (including maps of survey locations), and a results section with locations and descriptions of all special status wildlife species observed and an analysis of the potential of special status species to occur if not observed based on the observed habitat. The Letter Report will also address the Land Management Plan for the Inyo National Forest (USDA 2018) Desired Conditions, Goals, Standards, and Guidelines for Wildlife. Any special status species observed during the surveys will be reported to the CNDDB.

2.4.6.4 ACOUSTIC BAT HABITAT ASSESSMENT AND SURVEYS

2.4.6.5 LITERATURE REVIEW

Prior to the initiation of field surveys, a new literature review (including a new CNDDB query, scientific and gray literature) will be conducted to determine if any additional special status bat species have been identified as having the potential to occur within the Wildlife Study Plan Survey Area or in the immediate vicinity. The new literature review will also determine if the protective status of any of the previously identified special status bat species have changed and identify any new literature on the ecology and life history of special status species. In addition, coordination with, Kary Schlick, USFS biologist, and local bat expert, Dr. Michael Morrison, for the latest unpublished data on local special status bats species.

Based on the literature reviewed for this Study Plan, one special status bat species has been identified for field surveys: Townsend's big-eared bat. Another potentially sensitive bats species that may occur is the spotted bat. However, the bat community of the Bishop Creek area is poorly known, and the surveys will be designed to sample the bat community composition within the Wildlife Study Plan Survey Area.

2.4.6.6 2019 FIELD SURVEYS

A habitat assessment to determine the potential for bat presence at Project facilities will be performed in the late spring of 2019. Two bat biologists will visually survey Project facilities including the inside and outside of the powerhouses, and the outside of other out buildings. During the habitat assessment, bat biologists will survey Project facilities for any active bat roosting sites. The survey will include visually searching structures for sign of current or past bat roosts. Signs of roosting include the presence of guano, urine staining, or aural detection of social calls. Potential roost sites will be photographed, and the Project facility recorded and mapped. Based on the finding for this habitat assessment a Study Plan for ultrasonic acoustic surveys at Project facilities will be developed and coordinated with the USFS.

To gather information on the potential for overwintering at Project facilities, a one-day winter visual survey of Project facilities will be conducted. The timing for the winter survey will coordinated with the USFS but is anticipated to be performed from mid-December 2019 to late January 2020.

The absence of detectable roosting sign does not preclude the Project site from supporting active bat roosts, as some species leave less sign than others.

2.4.6.7 2020 FIELD SURVEY

Based on the results of the 2019 bat habitat assessment, ultrasonic acoustic surveys will be conducted at selected Project facilities, including powerhouses, out buildings, and impoundments. Potential maternity roosts were observed in powerhouses No. 2 and No. 5 in 2019. During the 2020 field survey, video recording cameras will be placed at these powerhouses to record emergence and be correlated to the audio recording to determine species. The purpose of collecting acoustic samples is to determine which species are utilizing the facilities. Prior to installing the ultrasonic acoustic recording devices, bat biologists will assess each site to identify the best location for microphone placement. Preferences for microphone placement will be at locations that sufficiently sample the appropriate bat foraging or commuting corridors.

The ultrasonic acoustic survey will be conducted during weather and lunar conditions conducive to bat foraging activity. Specifically, surveys will be scheduled to avoid full moon events and postponed avoiding uncharacteristic weather events, including high winds, low air temperatures and heavy precipitation. The survey will be scheduled to occur during months not associated with winter hibernation activity.

To the extent feasible, the microphones will be placed greater than 12 feet above the ground or other reflective surfaces to minimize echo effects. The microphones and associated equipment (e.g., poles) will be placed in locations that best mask the equipment to minimize effects on flight patterns. Acoustic recording will begin 15 minutes before sunset and extend throughout the night, ending 15 minutes before sunrise. Each facility will be monitored for a minimum of five consecutive nights to sufficiently sample the species diversity at the respective locations. Acoustic data will be recorded in full spectrum format in short intervals when triggered by pre-determined acoustic thresholds. The thresholds will be set to minimize the collection of environmental noise upon deployment of the acoustic recording devices.

The data collected will be analyzed using Sonobat software, Version 4.2.2; and all reported results will be vetted by bat biologists. Digital copies of the acoustic data will be archived both

before and after analysis. Metadata will be affixed to the processed data using the GUANO[3] format.

2.4.6.8 2019 REPORTING

A Technical Memorandum will be prepared following the 2019 acoustic bat habitat assessment. The Technical Memorandum will include an introduction, purpose and need, brief Project description, exiting conditions, methods (including maps of survey locations), and a results section with locations and descriptions of all roosting locations observed. The Technical Memorandum will identify the need for acoustic bat surveys to be conducted in 2020.

2.4.6.9 2020 REPORTING

A Letter Report will be prepared documenting the findings of the bat habitat assessment and acoustic bat survey. The Letter Report will include an introduction, purpose and need, existing conditions, brief Project description, methods (including maps of survey locations), and a results section with locations of facilities utilized by bats, as well as a, list of all bat species observed or recorded. The Letter Report will also address the Land Management Plan for the Inyo National Forest (USDA 2018) Desired Conditions, Goals, Standards and Guidelines for Wildlife. Any special status species observed during the surveys will be reported to the CNDDB.

2.4.7 AMPHIBIAN SURVEYS

2.4.7.1 LITERATURE REVIEW

Prior to the initiation of field surveys, a new literature review (including a new CNDDB query, scientific and gray literature) will be conducted to determine if any additional special status amphibian species have been identified as having the potential to occur within the Wildlife Study Plan Survey Area or in the immediate Project vicinity. The new literature review will also determine if the protective status of any of the previously identified special status amphibian species have changed and any new literature on the ecology and life history of special status amphibian species.

[3] GUANO is a universal, extensible, open metadata format for bat acoustic recordings. https://myotisoft.com/2017/04/guano-metadata-format. Accessed September 8, 2018.

Based on the literature reviewed for this Study Plan, three special status amphibian species have been identified for field surveys: SNYLF, Yosemite toad, and northern leopard frog.

2.4.7.2 2019 FIELD SURVEYS

Surveys for special status amphibians will be performed by a team of two qualified biologists. Biologists will perform a pedestrian survey along recaches of Bishop Creek scheduled for electrofishing. The timing and location of the surveys along Bishop Creek will be coordinated with the electrofishing survey schedule so that visual surveys for special status amphibians can be performed immediately prior to the electrofishing surveys. Prior to the start of the surveys, aerial photographs of each facility at a 1-inch to 200-foot scale will be prepared for field use to map existing features and note wildlife occurrences and areas of potentially suitable habitat. Each survey will include both diurnal and nocturnal searches to determine the presence of eggs, tadpoles and adults. During the diurnal surveys, water will be examined for the presence of special status amphibian egg masses and tadpoles. Nocturnal surveys will begin one hour after dusk during weather conditions conducive to toad activity. Nocturnal search methods include walking along the impoundment and creek banks and stopping periodically to listen for the breeding calls of adult males. Headlamps and flashlights will be used to visually identify amphibians when a breeding call is heard. If any special status amphibians are found, the individual or population will be documented and recorded with a GPS unit. Other wildlife species observed will be recorded in field notes to species (if possible) and location. Surveys will follow recommended protocols for special status amphibians as described in Rombough (2012) and Peek et al. (2017), including decontamination procedures.

2.4.7.3 2020 FIELD SURVEY

Should the results of the 2019 field survey for special status amphibians demonstrate the need for further surveys. A work plan for 2020 will be developed in consultation with the USFS.

2.4.7.4 2019 REPORTING

A Technical Memorandum will be prepared following the 2019 special status amphibian survey. The Technical Memorandum will include an introduction, purpose and need, brief Project description, exiting conditions, methods (including maps of survey locations), and a results

section documenting all amphibians and other wildlife observed. The Technical Memorandum will identify the need for further surveys to be conducted in 2020.

2.4.7.5 2020 REPORTING

Should a 2020 survey be undertaken, a Letter Report will be prepared documenting the findings of the 2019-2020 amphibian surveys. The Letter Report will include an introduction, purpose and need, existing conditions, brief project description, methods (including maps of survey locations), and a results section with locations and descriptions of any amphibians observed. The Letter Report will also address the Land Management Plan for the Inyo National Forest (USDA 2018) Desired Conditions, Goals, Standards, and Guidelines for Wildlife. Any special status species observed during the surveys will be reported to the CNDDB.

2.4.8 SCHEDULE, PERIODIC REPORTING AND ONGOING CONSULTATION

The anticipated Study Plan development and implementation schedule is identified in Table 2-17. As described in the PAD and NOI, SCE is anticipating seeking an expedited Study Plan determination process for some plans or for portions of some plans.

TABLE 2-17 ANTICIPATED POST PAD/NOI STUDY PLAN DEVELOPMENT MILESTONES AND FERC PROCESS THROUGH STUDY PLAN DETERMINATION

TASK	RESPONSIBLE ENTITY	SCHEDULE MILESTONES
File NOI/PAD with FERC along with Proposed Study Plans	SCE	May 1, 2019
FERC Holds Scoping and Site Visit	FERC	July 1, 2019 – July 31, 2019
Deadline for Comments on PAD and Study Requests	Stakeholders	Aug 30, 2019
Preliminary Field Season[1]	SCE	2019
Fall TWG Workshop	SCE & TWG	Nov 2019
Request for waiver of 18 CFR 5.12 & 5.13	SCE	Sep 2, 2019
FERC Director's Study Plan Determination (assumes waiver granted)	FERC	Nov 8, 2019
First Field Season	SCE	2019
Initial Study Report (adjust as necessary in consultation with TWGs)	SCE	Nov 9, 2020
Second Field Season (as necessary)	SCE	2020
Final Study Report	SCE	Nov 9, 2021
License Application	SCE	June 2022

[1] Note: Because the 2019 field season precedes the Study Plan Determination is noted as "preliminary" because to avoid confusion with the FERC sequence of field season followed by Initial Study Report. For similar reasons, a fall TWG workshop is offered to review the results of the preliminary field season

This schedule is predicated based upon attaining agency agreement on the general goals, objectives and methods of the study, with the understanding that additional details may be resolved between the filing of the PAD and NOI, and the deadline for stakeholders to file comments on the PAD and make study requests. As well, there are additional decisions and ongoing consultation needs throughout the implementation of the study. For this plan, the outstanding items for consultation are listed in Table 2-18. This table distinguishes between those items that need resolution before the study can be implemented, and those that would be the subject of ongoing consultation with the appropriate TWG.

TABLE 2-18 ANTICIPATED ADDITIONAL CONSULTATION TASKS

IMPLEMENTATION DETAIL FOR RESOLUTION	SCHEDULE FOR RESOLUTION
Final edits and implementation details with USFS	June-July 2019
Field schedule and Implementation Plan	June-July 2019

The sequence for implementing identified tasks, once finalized, are identified in Table 2-19.

TABLE 2-19 ANTICIPATED IMPLEMENTATION SEQUENCE

IMPLEMENTATION DETAIL FOR RESOLUTION	SCHEDULE FOR RESOLUTION
Second General Wildlife Surveys (Spring and Summer) at selected Project Locations	Following first study season
Focused Surveys for Special Status Wildlife at selected Project locations	Following first study season
Focused Surveys for Bats at Selected Project Structures	Following first study season
Focused Special Status Amphibian Surveys at selected Project Locations	Following first study season

2.4.9 STUDY PLAN CONSULTATION RECORD

This Wildlife Study Plan was developed in consultation with the Bishop Creek Terrestrial and Botanical Resources TWG. The intent of the consultation process is to achieve consensus, to the degree possible, for the need for specific studies, key resource questions to be addressed by the studies, and the appropriate methodology and level of effort for the study.

This section summarizes the key consultation milestones for each Study Plan (Table 2-20), and how SCE addressed comments received through the consultation process. Table 2-21 is a Response to Comments Table for comments received from stakeholders and how comments were addressed in the final Study Plan. If stakeholder comments are not incorporated, Table 2-21 would provide a rationale based on Project specific information and FERC's Study Plan Criteria (18 CFR § 5.9).

TABLE 2-20 KEY STUDY PLAN DEVELOPMENT MILESTONES AND TECHNICAL WORKING GROUP PLANNING SCHEDULE

DELIVERABLE	MATERIAL DISTRIBUTED	MEETING TYPE	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
Revised Study Plans	11/15/2018	TWG	12/4/2018 to 12/6/2018	1/7/2019
Proposed Study Plans (filed with PAD)	5/1/2019	TWG	6/12/2019 and 6/19/2019	7/12/2019

TABLE 2-21 SCE RESPONSES TO COMMENTS RECEIVED ON STUDY PLANS

COMMENT NO.	DATE OF COMMENT	ENTITY	COMMENT	SCE RESPONSE
1	8/14/2018	TWG Meeting	Impacts of the Project on mule deer migration are not a significant concern but should be reviewed as part of a larger wildlife study of the interactions with Project facilities.	The Mule Deer Study Plan is no longer a stand-alone Study Plan but has been incorporated into the Wildlife Study Plan
2	8/31/2018	Tristan Leong, USFS	Suggest mule deer specific objective to determine if the resident mule deer herd and/or other wildlife species are affected by or alter their migratory patterns in response to Project infrastructure or operation, evaluate the use at existing crossing structures to determine adequacy.	SCE adopted this objective as part of the Wildlife Study Plan.
3	8/31/2018	Tristan Leong, USFS	Propose Special Status Species Study Plan with these objectives:	SCE incorporated these objectives into the Wildlife Study Plan; combining plans and study titles will lead to

COMMENT NO.	DATE OF COMMENT	ENTITY	COMMENT	SCE RESPONSE
			• Assess special status raptor use in the Project area • Assess special status bats in the Project area • Willow flycatcher? • Wolverine/other?	efficiencies in study planning and execution. Objectives relating to special status species are being added. Project interactions with wolverines and willow flycatchers will be analyzed using existing information.
4	8/31/2018	Tristan Leong, USFS	Proposed identification and characterization of management species and include site specific surveys.	SCE will incorporate these suggestions; site-specific surveys will continue to focus on areas of high potential for occurrence or that may utilize Project facilities.
5	10/10/18	TWG Meeting	Willow flycatcher nesting habitat need to be defined by USFS criteria. Assuming willow flycatcher presence may require Incidental Take Permit (ITP) from CDFW.	SCE will rely on USFS definition willow flycatcher suitable habitat for use in wildlife surveys. Assess impacts on project by project to determine of ITP is needed.
6	10/10/18	TWG Meeting	Proposed to include northern goshawk acoustic surveys into the Study Plan.	SCE will incorporate acoustic dawn surveys for northern goshawk at those facility locations near suitable northern goshawk nesting habitat.
7	10/15/18	Telephone coordination with USFS (Kary Schlick) and Texan A&M bat biologist (Michael Morrison)	Discussion Study Plan's approach to bat acoustic surveys. Proposed to include lakes and impoundments adjacent to Project facilities to capture foraging bats.	SCE will incorporate adjacent lakes and impoundments into the acoustic bat survey.
8	10/19/18	Telephone coordination with CDFW	CDFW will provide map of known mule deer locations	SCE will incorporate this information into planning for field surveys.

COMMENT NO.	DATE OF COMMENT	ENTITY	COMMENT	SCE RESPONSE
		nuke deer biologist Mr. Michael Morrison	in project area when available	
9	11/13/18	E-mail from USFS (Kary Schlick)	USFS provided the USFS definition of suitable willow flycatcher habitat, and link to willow flycatcher survey protocol. USFS also provided the document describing norther goshawk survey protocols. USFS also provided justification for goshawk surveys and the mapping of willow flycatcher habitat.	SCE will incorporate acoustic dawn surveys northern goshawk surveys into the Wildlife Study Plan. SCE will include mapping of USFS defined willow flycatcher suitable habitat into the Wildlife Study Plan.

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3.0 AQUATICS AND AQUATIC PROCESSES STUDY PLANS

3.1 BISHOP CREEK INSTREAM FLOW NEEDS ASSESSMENT STUDY PLAN (AQ 1)

3.1.1 PROJECT NEXUS AND RATIONALE FOR STUDY

During TWG meetings, stakeholders identified the need for an Instream Flow Needs Study Plan that focuses on creeks located below Project plant diversions, and to lesser extent on Birch and McGee creeks below Project diversions. This Study Plan details SCE's proposal for study objectives, study area, methods and a schedule for the effort. The goal of this study is to evaluate the effect of Project operation, including the current minimum instream flow releases and channel maintenance flows on aquatic resources of Project streams including the South and Middle forks of Bishop Creek and the Bishop Creek plant bypass reaches and Birch and McGee creeks. A separate sediment and geomorphology (S&G) study has been proposed to address the effect of Project operation and facilities on recruitment and movement of large woody debris and coarse sediment on aquatic habitat, specifically of macroinvertebrates.

Project operations may potentially affect habitat suitability in Bishop Creek below each plant diversion depending on the amount of spill allocated to the creek via spill. CDFW proposes to manage the creek below Plant 4 primarily for species indigenous to the Owens Watershed and lower Bishop Creek (specifically Owens sucker and speckled dace). CDFW manages Bishop Creek upstream from Plant 4 primarily as a self-sustaining fishery for introduction of brown trout.

There are presently year-round minimum flow requirements for each of the bypass reaches that were established during the prior relicensing, based on the result of a 1986 Physical Habitat Simulation (PHABSIM) model (EA 1988). These flows vary by stream segment, ranging between 11 and 18 cubic feet per second (cfs). CDFW is concerned that these flows may potentially be outdated for purposes of habitat protection, due to changes in stream morphology, mesohabitat distribution, habitat management and applicable habitat suitability criteria that have ensued over recent decades.

3.1.2 METHODOLOGY AND STUDY AREA

The scope of this study is to quantify the effects of Project bypass reach flows on aquatic habitat suitability for both the Bishop Creek watershed, and Birch and McGee creeks aquatic community to support its managed fish resources. These data would be used in conjunction with hydrologic, operational and other models to evaluate the costs and benefits of providing alternate flows to the targeted reaches of the Project.

3.1.2.1 UPSTREAM AND DOWNSTREAM BOUNDARIES

The South and Middle forks of Bishop Creek above Plant 2, and Bishop Creek between the Plant 2 spillway and Plant 6 (Figure 3-1) were identified by the CDFW as the overall study area for purposes of this study. Reaches below Plant 4 are managed primarily for native non-game species including Owens sucker and speckled dace, whereas reaches upstream from Plant 4 are managed as a self-sustaining brown trout fishery as the priority. On Birch and McGee creeks, the study area extends from each respective diversion downstream to a point that captures both upper and lower stream geomorphology.

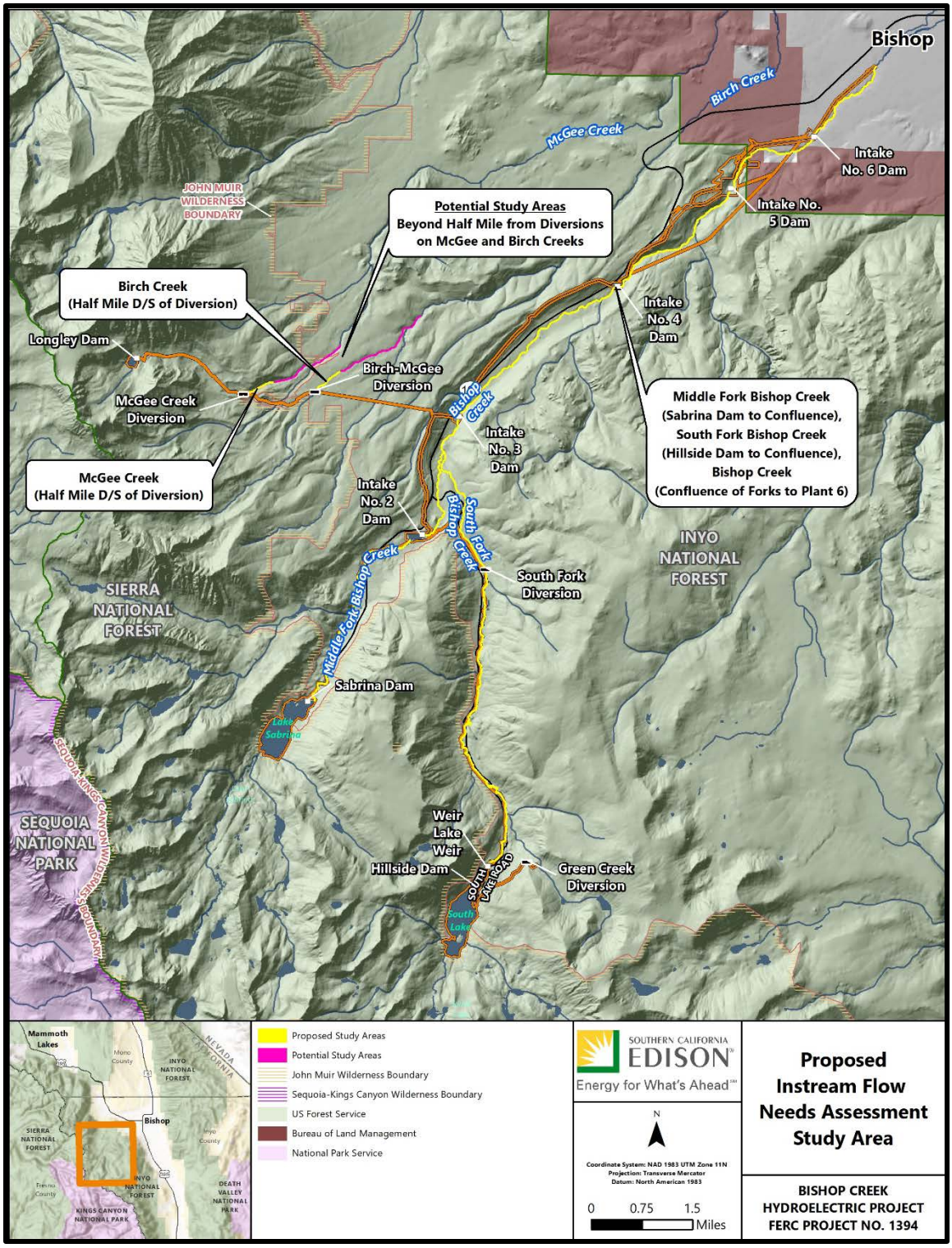

FIGURE 3-1 PROPOSED INSTREAM FLOW NEEDS ASSESSMENT STUDY AREA

3.1.2.2 INSTREAM FLOW INCREMENTAL METHODOLOGY

For the Bishop Creek watershed, the CDFW recommended an Instream Flow Incremental Methodology (IFIM) study to develop an understanding of key habitat-flow relationships in the study area and to serve as a basis for negotiating instream flow recommendations for the Project. This may be quantified by models such as PHABSIM or its equivalent. The model will be used to simulate reach-specific habitat suitability at various flow increments representing selected fish species. One-dimensional (1-D) (transect-based) hydraulic models will be used to simulate channel hydraulics in various areas of interest.

A simplified IFIM approach using empirical data rather than simulation will be used to assess flows on Birch and McGee creeks.

Consistent with IFIM protocol, a study team comprised of agency and SCE biologists, along with aquatic TWG members, will make technical decisions regarding input parameters and review of study results. Specifically, the team will collaboratively provide input on:

- specific spatial and temporal habitat management goals,
- boundaries of the study area and reaches,
- locations of specific representative or critical study sites, and study site transects,
- habitat suitability index (HSI) criteria for applicable species and life stages, and
- calibration of flows and the range of flows to be assessed.

3.1.2.3 STUDY SITE SELECTION AND MESOHABITAT MAPPING

The proposed study methodology involves a phased approach beginning with mapping mesohabitat distribution in the study area as Phase 1.

Mesohabitats are recurring types of aquatic habitat such as riffles, runs, pool and glides. The mapping and characterization of aquatic mesohabitat provides essential information regarding the extent, location and composition of specific aquatic habitats that may be affected by Project operation and to inform the secondary phase of study if necessary. Each mesohabitat type of interest will be assigned specific attributes to be used for field delineation based on Levels III and IV habitat types defined by Flosi (2010). These include:

RIFFLE
Low Gradient Riffle
High Gradient Riffle

CASCADE
Cascade
Bedrock Sheet

FLATWATER
Pocket water
Glide
Run
Step run
Edgewater

MAIN CHANNEL POOL
Trench pool
Mid-channel pool
Channel confluence pool
Step pool

SCOUR POOL
Corner Pool
l. Scour pool - log enhanced
l. Scour pool - root wad enhanced
l. Scour pool - bedrock formed
l. Scour pool - boulder formed
Plunge pool

BACKWATER POOLS
Secondary channel pool
Backwater pool - boulder formed
Backwater pool - root wad formed
Backwater pool - log formed
Dammed pool

ADDITIONAL UNIT DESIGNATIONS
Dry
Culvert
Not surveyed

Delineation should occur at sufficiently low flow to allow for mesohabitat boundaries, dominant substrate, object cover, and hydraulics representative of approximate base flow conditions can be readily observed. The upstream and downstream boundary of each mesohabitat unit within the study area will be geo-referenced in the field, and the information transferred to a GIS format.

GIS will be used to provide both a visual map and quantitative tabular information on the abundance of each mesohabitat type in the study area. To the extent possible, study sites employed in both the past IFIM Study (EA 1988) and more recent sedimentation and monitoring studies (Simons 1990; Read and Sada 2013) would be revisited to determine the extent to which stream geomorphic characteristics such as slope, width and substrate type have remained stable since the time of the previous modeling.

3.1.2.4 SELECTION OF REACHES, STUDY SITES AND TRANSECTS

Study reach boundaries are typically placed at significant breaks in geomorphic, hydrologic or habitat use in the study area (Bovee et al. 1998). The study team will review the mesohabitat mapping and site reconnaissance data obtained above, to define study reaches and select applicable candidate study sites within each reach, as well as transects within each study site.

Study sites will represent typical habitats. At the recommendation of CDFW, study sites will be selected through a stratified random selection process. To the extent possible, the study sites will be located in three units of each significant mesohabitat type within each homogenous river segment, and at least three transects will be located within each mesohabitat unit (CDFG 2008).

3.1.2.5 DATA COLLECTION AND MODELING

Phase 2 would quantify habitat-discharge relationships for selected species and life stages in the study area, using standard PHABSIM data collection and flow modeling procedures (Bovee 1982; Bovee et al. 1998). Modeling will focus on selected species and life-stage critical mesohabitat types. The 1-D model approach, using PHABSIM is suitable for each of the reaches. The 1-D modeling approach will be based on hydraulic data developed from cross-sectional depth, velocity and detailed substrate measurements following Milhouse et al. (1989), using PHABSIM for Windows (V 1.5.1), developed by USFWS and distributed by the USGS Fort Collins Science Center, Colorado.

3.1.2.6 FLOW RANGE TO BE MODELED

Based on agency consultation, SCE anticipates that habitat-discharge relations will be developed for flows ranging from approximately 2 cfs to 75 cfs.

3.1.2.7 SUITABILITY INDEX CRITERIA

SCE anticipates using HSI curves adopted primarily from those previously used in applicable instream flow studies (developed in support of recent PHABSIM models) conducted at study sites with similar geomorphic and ecoregion characteristics. HSI curves will be obtained from other studies, and reviewed for applicability, discussed, modified as necessary and approved by the study team. HSI curves for Owens sucker may be developed from CDFW field data. Based on preliminary consultation with agencies, SCE proposes to develop habitat suitability criteria for brown trout, Owens sucker and Owens speckled dace (Table 3-1).

TABLE 3-1 PROPOSED SPECIES AND LIFESTAGE CRITERIA TO ASSESS INSTREAM FLOW HABITAT NEEDS IN BISHOP CREEK

Brown trout	Juvenile
	Adult
	Young-of-year
Owens sucker	Spawning
	Incubation (if different than spawning)
	Juvenile
	Adult
Speckled dace	Adult

3.1.2.8 MACROINVERTEBRATES

Macroinvertebrates are substrate oriented; therefore, SCE intends to address the potential impacts within the Phase 1 IFIM study, by characterizing the dominant substrates inventoried during the mesohabitat survey and applying literature to discuss how the presence/absence of suitable substrates affect their distribution. Information gathered as part of Phase 1 of the IFIM study will be assessed as part of the S&G Study Plan (AQ 6).

3.1.2.9 TRANSECT DATA COLLECTION

The location of each transect will be field blazed with flagging or other appropriate means. Each study site and cell boundary will be mapped sufficiently to quantify the area represented by each transect. The transect headpin and tailpins will be located at or above the top-of-bank elevation and secured by steel rebar or other similar means. A measuring tape accurate to 0.1 foot will be

secured at each transect to enable repeat field measurements at specific stream loci.[4] Stream bed and water elevations linked to local datum will be surveyed to the nearest 0.1 foot using standard optical surveying instrumentation and methods.

Depth, velocity and substrate data will be gathered at intervals (verticals) along each transect. Each vertical will be located to the nearest 0.1 foot wherever an observed shift in depth or substrate/cover occurs. Between 20 and 99 verticals per transect will be established as necessary on each transect. Verticals will be arrayed so that no more than ten percent of the discharge passes between any pair of verticals; enhancing hydraulic model calibration. A staff gage will be located in each study site and monitored at the beginning and end of each set of hydraulic measurements to verify stable flow during measurements. If flow is determined to be unstable, the related data will be discarded and re-measured once stable flow is established.

Mean column velocity will be measured to the nearest 0.1 foot per second with either a calibrated electronic velocity meter mounted on a top-setting wading rod, or alternatively an Acoustic-Doppler Current Profiler (ADCP) transducer. In water less than 2.5 feet in depth, measurements will be recorded at 0.6 of total depth (measured from the water surface); at greater depths, paired measurements would be recorded at 0.2 and 0.8 of total depth and averaged.

Each calibration flow will be provided by scheduled releases from the Project via gate settings or spillage; study-site field gaging will be used to estimate each calibration flow release. The hydraulic model will be built from measurements gathered at a minimum of three calibration flows to facilitate extrapolation of hydraulic data across the range of interest. To accomplish calibration, a full set of depth, velocity and water surface elevation (WSEL) data will be gathered at the intermediate flow, and WSEL will be measured at each transect for the low and high flow calibration. Supplemental velocity data may be gathered at the low calibration flow at transects with complex hydraulics such as riffles, and/or sites with unusual backwatering or eddy effect which will be determined in the field on a case-by-case basis.

Each calibration flow should be broadly separated to provide a suitable stage-discharge curve for the hydraulic model. At a minimum, SCE anticipates utilizing calibration flows of

[4] Supplemental transects may be located as needed to record water surface and bed elevation data at hydraulic controls to establish backwatering parameters necessary for hydraulic modeling.

approximately: 8 cfs, 16 cfs and 40 cfs. Depending on calibration quality, this should allow a standard PHABSIM model to Project weighted usable area (WUA) for a flow range from 2 cfs to approximately 100 cfs. The need for additional calibration flow data may vary by transect and will be evaluated on a case-by-case basis.

3.1.2.10 HYDRAULIC MODELING

Hydraulic modeling will be accomplished by correlating each surveyed water-stage-set with discharge to develop a stage-discharge relationship for each transect. PHABSIM uses hydraulic models such as IFG4, MANSQ and WSP and once this modeling relationship is established, the model will adjust velocities obtained at calibration flows to other flow increments of interest for which defined water stages have been calculated. The model will be calibrated by comparing simulated hydraulics created at calibration flows to the empirical measurements taken at the calibration flows. Coefficients such as relative stream channel roughness will be iteratively adjusted as needed to optimize model accuracy across the full flow range.

3.1.2.11 HABITAT SUITABILITY

Once the hydraulic model is calibrated, estimates of habitat suitability for each flow increment of interest will be generated by combining the HSI and hydraulic model data using the HABTAE program and supporting programs within PHABSIM. These programs produce a habitat quality index referred to as WUA for each transect at each flow increment. The WUA indexes suitability as units of square feet of optimal habitat available per 1000 feet of represented stream length. The WUA habitat-flow curve across the flow range for all transects in a given study site will be weighted and summed at the study reach level, according to actual linear stream length that each site represents, as mapped in the field.

A draft Study Report will be prepared for the TWG review and comment, documenting methods and results. The Study Report will quantify flow and WUA relationships for applicable species and life stages in each study reach. WUA and supporting hydraulic data will be presented in graphic and tabular form, along with an analysis of trends in the data, and documentation of study team consultation. Appendices will include cross-sectional survey data and reference photographs of study sites. The Study Report will be finalized following receipt of input from the study team.

3.1.2.12 ANALYSIS

In the final phase, the basic flow and WUA relationships will be applied in consultation with the study team to habitat, station operations and hydrology data.

3.1.2.13 MODIFIED APPROACH FOR BIRCH AND MCGEE CREEKS

CDFW indicated that there is no specific management goal for these creeks, other than to provide an adequate base flow suitable for supporting introduced-self-sustaining brook trout populations in the upper reach of each creek (i.e. immediately downstream from the diversions) and for native cyprinid species (Owens speckled dace) in the lower segment of each creek. An empirical Flow Demonstration Study will be conducted below the diversion on each of these creeks. This kind of approach is frequently used when:

- the study area is small,
- only a few flow increments (e.g. high-medium-low) need to be assessed,
- biological issues are not complex or controversial,
- a PHABSIM model simulation would not be feasible or cost-effective,
- there is a control structure upstream that can rapidly change the flow so that observations can be made efficiently at each flow step.

In this approach, decisions will be made by obtaining empirical data on the spot by selecting a few representative habitat areas in each creek. At each flow release, the team of TWG biologists will methodically wade through each study area to gather depth, velocity, and wetted substrate information either along transects or via spot measurements. The habitat suitability of these data will be collaboratively discussed and ranked in the field by the team, typically using pre-selected HSI criteria. This exercise is repeated for each of the staged flows. The data will then be reviewed in the field to reach agreement on which flow(s) provides habitat suitability that adequately meet agency management goals. Both the scoring results and discussion will be documented in meeting notes, tables, and photographs and bed profiles will be obtained. In this case three or potentially more flow releases will be targeted in consultation with TWG stakeholders prior to conducting the study.

3.1.3 SCHEDULE, PERIODIC REPORTING AND ONGOING CONSULTATION

The anticipated Study Plan development and implementation schedule is identified in Table 3-2. As described in the PAD and NOI, SCE anticipates seeking an expedited Study Plan determination process for some plans or for portions of some.

TABLE 3-2 ANTICIPATED POST PAD/NOI STUDY PLAN DEVELOPMENT MILESTONES AND FERC PROCESS THROUGH STUDY PLAN DETERMINATION

TASK	RESPONSIBLE ENTITY	SCHEDULE MILESTONES
File NOI/PAD with FERC along with Final Study Plans	SCE	April 8, 2019
FERC Holds Scoping and Site Visit	FERC	May 30, 2019 – June 29, 2019
Deadline for Comments on PAD and Study Requests	Stakeholders	Aug 6, 2019
Preliminary Field Season[1]	SCE	2019
Fall TWG Workshop	SCE & TWG	Nov 2019
Request for waiver of 18 CFR 5.12 & 5.13	SCE	Aug 7, 2019
FERC Director's Study Plan Determination (assumes waiver granted)	FERC	Sep 13, 2019
First Field Season	SCE	2020
Initial Study Report (adjust as necessary in consultation with TWGs)	SCE	Sep 14, 2020
Second Field Season (as necessary)	SCE	2021
Final Study Report	SCE	Sep 14, 2021
License Application	SCE	June 2022

[1] Note: Because the 2019 field season precedes the Study Plan Determination is noted as "preliminary" because to avoid confusion with the FERC sequence of field season followed by Initial Study Report. For similar reasons, a fall TWG workshop is offered to review the results of the preliminary field season

This schedule is predicated on attaining agency agreement on the general goals, objectives and methods of the study, with the understanding that additional details may be resolved between the filing of the PAD and NOI, and the deadline for stakeholders to file comments on the PAD and make study requests. There will be additional decisions and ongoing consultation needs throughout the implementation of the study, as noted in Section 3.1.4. Table 3-3 summarizes the anticipated implementation sequence, once plans and schedules have been finalized with the appropriate TWGs.

TABLE 3-3 ANTICIPATED IMPLEMENTATION SEQUENCE

IMPLEMENTATION DETAIL FOR RESOLUTION	SCHEDULE FOR RESOLUTION
Mesohabitat mapping	Late summer 2019
Study site and transect selection	September-October 2019
Finalize Habitat Suitability Indices	Fall 2019
Survey cross-section and hydraulics at transects	October 2019
Model calibration	Winter 2020
Habitat analysis and draft report	Mid - 2020

3.1.4 STUDY PLAN CONSULTATION RECORD

This Study Plan was developed in consultation with the Bishop Creek Aquatic Resources TWG. The intent of the consultation process is to achieve consensus, to the degree possible, for 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 section summarizes the key consultation milestones for each Study Plan (Table 3-4), and how SCE addressed comments received through the consultation process. Table 3-5 is a Response to Comments Table for comments received from stakeholders, and how comments have been addressed in the final Study Plan. Should stakeholder comments not be incorporated, Table 3-5 will provide a rationale based on Project specific information and FERC's Study Plan Criteria (18 CFR § 5.9).

TABLE 3-4 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
Revised Study Plans	11/15/2018	TWG	12/4/2018 to 12/6/2018	1/7/2019
Proposed Study Plans (filed with PAD)	5/1/2019	TWG	6/12/2019 and 6/19/2019	7/12/2019

TABLE 3-5 SCE RESPONSES TO COMMENTS RECEIVED ON STUDY PLANS

COMMENT NO.	DATE OF COMMENT	ENTITY	COMMENT	SCE RESPONSE
1	8/29/2018	Nick Buckmaster, California Department of Fish & Wildlife	Instream Flow Study should be renamed "instream needs study".	SCE renamed this study as the "Instream Flow Condition Assessment".
2	8/29/2018	Nick Buckmaster, California Department of Fish & Wildlife	A separate operations model should be developed in concert with a flow habitat study.	This operational model is being developed and will be reviewed and refined with the TWG.
3	8/31/2018	Tristan Leong, USFS	Evaluate the effect of Project operations on instream habitat for self-sustaining trout populations in Project affected reaches. Attempt to use existing information (where feasible) and compare with previous PHABSIM study.	SCE modified the objectives to reflect interest in self-sustaining brown trout populations in Bishop Creek.
4	8/31/2018	Tristan Leong, USFS	Propose striking objective relative to habitat limitations for large woody debris and sediment.	Removing this emphasis is consistent with previous TWG discussions. Presumably the focus on sediment would be addressed by the USFS proposed geomorphology Study Plans, which SCE is still evaluating.
5	10/29/2018	Nick Buckmaster, Beth Lawson, Brionna Drescher, California Department of Fish & Wildlife	Via conference call: CDFW had concerns about robustness of historic model in absence of source data-decks; provided additional recommendations regarding study scope. Provided habitat management objectives for stream reaches.	SCE has significantly revised the scope of this study to address concerns; rather than using existing historic data as basis for model, a fresh IFIM model to be included which covers identified management objectives identified. See Attachment 1 for more detailed discussion about CDFW concerns and SCE's proposed response.
6	2/26/2019	Kary Schlick, USFS	This project relates to native and nonnative habitats; therefore, I would like to be invited as one of the TWG members.	
7	2/26/2019	CDFW	CDFW provided rationale for requested study. Please see Attachment X	

MEMORANDUM

To: Aquatic Resources TWG
From: Brandon Kulik
Date: November 9, 2018
RE: Bishop Creek Instream Flow Needs Study Plan Status

Based on our ongoing discussions with California Fish and Wildlife Department (CDFW) SCE is in the process of revising the Instream Flow Needs Study Plan. This memo summarized SCE's understanding of the issues and proposed scope approach.

SCE had originally hoped to utilize elements of the existing study[5] to evaluate minimum flows in Bishop Creek as a platform to assess new instream flow and habitat issues. The scope contemplated first validating that historic mesohabitat distribution, transects, and related hydraulics are still reasonably representative of existing conditions. However, CDFW has expressed concerned that the 1986 Physical Habitat Simulation (PHABSIM) model documentation included with the related report is not adequately robust for purposes of validation or further model refinement. Therefore, it may be difficult to assess whether the Bishop Creek channel has remained adequately stable since the time of the past study to accurately support current analytical needs[6].

SCE is continuing to search old project files to attempt to relocate paper copies of the PHABSIM modeling data that could provide a reliable baseline for model validation. If files cannot be relocated SCE proposes to move forward with the TWG to scope a conventional PHABSIM model that will be focused on the following reach-specific aquatic habitat management goals expressed by CDFW:

1. **Bishop Creek below Plant 4**. Manage habitat below targeted diversion dams with priority for native species including Owens sucker and speckled dace, and secondarily to support the existing brown trout fishery.
2. **Bishop Creek upstream from Plant 4**. Manage habitat to support brown trout

Other scope elements would include:

1. Mesohabitat mapping as an initial step to inform study sites and transect selection,
2. Research and apply more current Habitat Suitability Criteria (HSC) to apply rating curves to hydraulic data for trout, Owens sucker and speckled dace,
3. Collect hydraulic calibration data to support simulating flows between 2 and 75 cfs.

[5] The past study used over 100 transects distributed in a number of study segments between the reservoirs and Plant 5 in Bishop Creek to simulate trout habitat suitability between approximately 2 to 75 cfs. Results were used to provide reach-specific habitat protective flows that are incorporated into the existing license.

[6] Riparian and sedimentation monitoring studies that are ongoing through*2009* include transects surveyed over time that in some cases were in, or near some of the historic PHABSIM transects. Some of the transect pins are still intact (*Edith Read, personal communication, Nov 2, 2018*) and will be reviewed in the field by SCE to evaluate the extent to which channel conditions have remained in equilibrium.

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3.2 BISHOP CREEK OPERATIONS MODEL STUDY PLAN (AQ 2)

3.2.1 PROJECT NEXUS AND RATIONALE FOR STUDY

During the TWG meetings, stakeholders identified the need to develop a simple operations model to assist stakeholders and SCE identify key hydrologic connections among the components of the Project. This model would facilitate an understanding how potential changes to the system or its operation may influence the hydrology of the Project area.

Continued Project O&M, and other activities including PME measures implemented during a new license will require an understanding of the existing relationship between hydrology and Project operations. Proposed studies will evaluate the potential impacts of the Project's continued operations on the existing aquatic and riparian environment. A tool is needed to inform these study efforts and to evaluate the feasibility of any proposed operational changes that may be considered a result of those efforts.

3.2.2 STUDY GOALS AND OBJECTIVES

- Develop a robust Operations Model (Model) to assist SCE and stakeholders in understanding how Project operations interact with Bishop Creek hydrology. This model would be used to make informed decisions regarding the implementation of other relicensing studies. To meet this goal, this Study Plan has the following objectives:
    - Accurately model the systems inflows, outflows, and generation nodes.
    - 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 for all units to accurately represent installed and dependable capacity for licensing documents.
- Ensure that future Project facilities and operations are not inconsistent with the Desired Conditions described in the Land Management Plan for the Inyo National Forest (USDA 2018) as they relate to ecological sustainability and diversity of plant and animal communities.

3.2.3 REVIEW OF EXISTING INFORMATION

The model would combine physical attributes of the power generation facilities, basin hydrology, and legal and regulatory considerations to obtain a mathematical representation of how water

could be routed under alternative hydrologic regimes and regulatory scenarios. Therefore, this section reviews available data to develop the most appropriate inputs.

3.2.3.1 PROJECT FLOW ROUTING

The Project diverts water at three points: Green Creek at the Green Creek Diversion, McGee Creek at the McGee Creek Diversion, and Middle Fork Bishop Creek at Lake Sabrina.

Starting at the Green Creek Diversion (10,264 feet mean sea level [msl]) water flows through a pipeline to South Lake and is then released through Hillside Dam (9757.6 feet msl) into South Fork where it meets with the remaining flows from Green Creek that were not diverted. Together this water flows down the South Fork to the South Fork Diversion (8211 feet msl). At the South Fork Diversion structure, a portion of the flow is diverted through a pipeline to Intake No. 2 (8105 feet msl), and the rest continues to flow down South Fork. Upper watershed areas contributing to the Middle Fork drain into Lake Sabrina. Reservoir water exits through Sabrina Dam (9137.9 feet msl) into the Middle Fork which flows approximately 1 mile before converging with North Fork. The combined waters from the Middle and North forks of Bishop Creek flow to Intake No. 2 Dam (8104.8 feet msl) which also receives water from the South Fork Diversion flowline. From Intake No. 2 Dam, the water enters a 2.1-mile-long flowline and a 0.5-mile-long penstock which connects to Powerhouse No. 2 sited on Bishop Creek.

Powerhouse No. 2 receives water which originates from Longley Lake Dam (McGee Lake) and upper portions of the Birch Creek watershed. Longley Lake Dam (10,708 feet msl) discharges water to McGee Creek where it flows over 1 mile before it is intercepted by the McGee Creek Diversion (9192 feet msl). The diversion spillway connects to an open ditch and steel pipe which exits to Birch Creek. After entering Birch Creek, the water flows approximately 0.5 mile before being diverted again by the Birch Creek Diversion (8304 feet msl). At this point, the water enters a pipe where it descends over 1100 feet in elevation to Bishop Creek Powerhouse No. 2.

From this point on, a portion of the water flows down Bishop Creek and a portion is conveyed through a series of pipes and penstocks connecting Powerhouses Nos. 2, 3, 4, 5 and 6. Each powerhouse and intake controls the portion of water entering the creek and the portion directed into the pipe and penstock conveyances. After Powerhouse No. 6, Bishop Creek flows to the

Bishop community and the Owens Valley. In addition, a 1.79-mile ditch (Abelour ditch) carries water discharged from the Powerhouse No.6 penstock to the Rocking K subdivision.

The flowlines described above are considered the functional nodes that must be considered in the model (Figure 3-2).

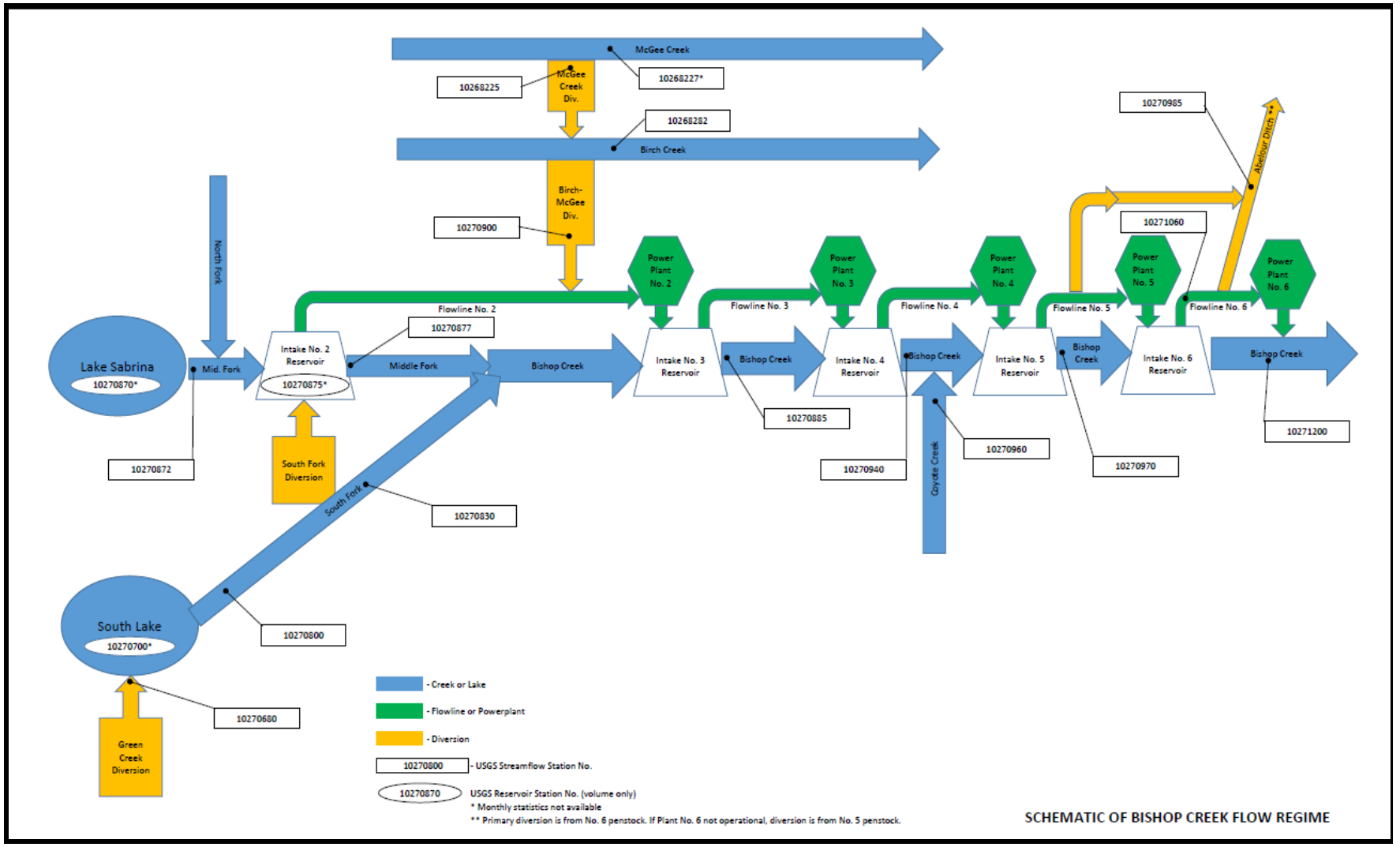

FIGURE 3-2 BISHOP CREEK FLOW ROUTING

3.2.3.2 PROJECT HYDROLOGY

Flow varies monthly, depending on the amount of runoff and SCE's release schedule, which is dictated by snowpack, snow melt, spring rain events, drought, power demand, and irrigation. At the lower end of the system, the peak runoff occurs from May to August. Annual runoff averages 100 cfs, with calculated monthly mean flows ranging from 41 cfs to 285 cfs. SCE reviewed and compiled the natural hydrograph for the period of record which includes 29 years of flow data (Table 3-6), based on the stream gages identified in Figure 3-2. From these data, curves representing normal, dry and wet years may be used in the model (Figure 3-3).

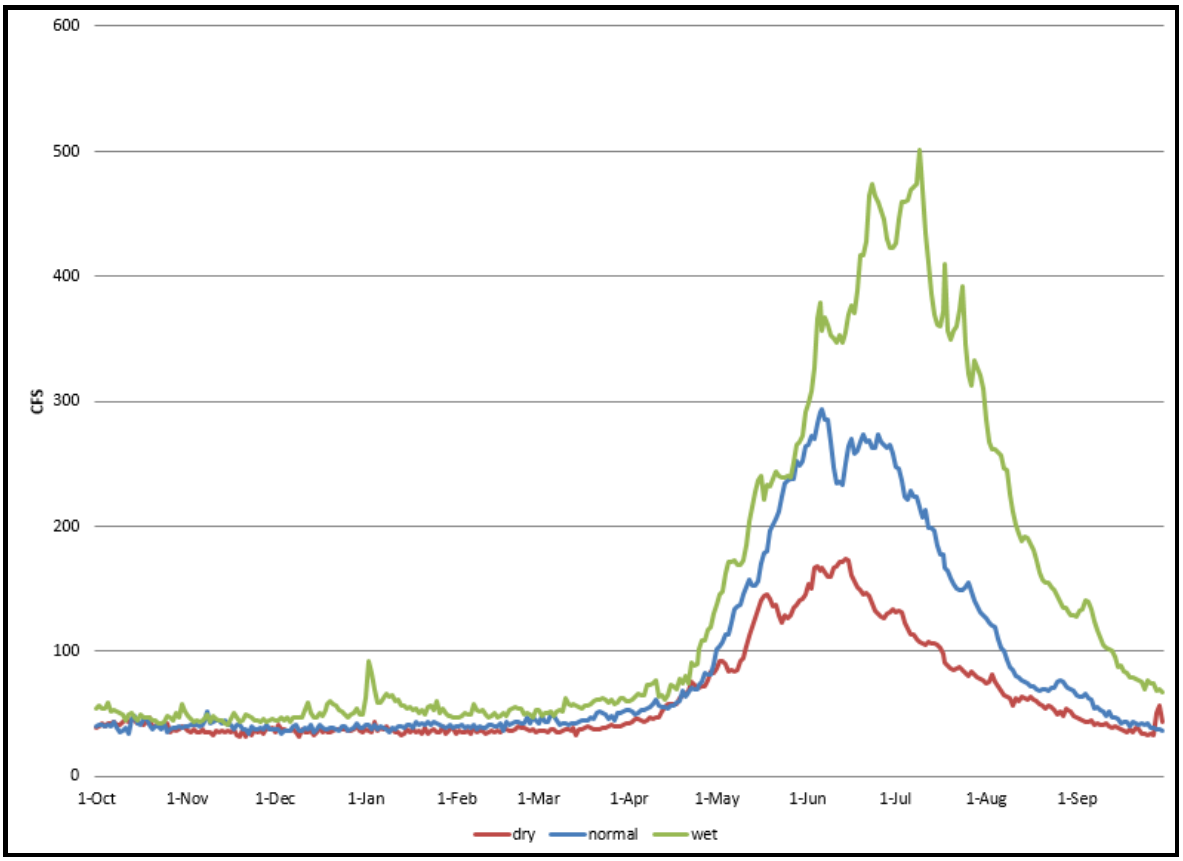

FIGURE 3-3 REPRESENTATIVE DRY, NORMAL, AND WET YEARS FROM THE NATURAL HYDROGRAPH ON BISHOP CREEK (1989-2017)

The regulated reaches between Lake Sabrina and Intake No. 2 and between South Lake and South Fork Diversion experience similar flow fluctuations. Because these reaches aggregate and convey all Project flows, they are never as low as the flows in the diverted sections. During wet years, the regulated reaches have much higher flows. The current license requires minimum flow releases into diverted reaches.

TABLE 3-6 ACRE-FEET OF UNREGULATED FLOW IN BISHOP CREEK DRAINAGE

Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
1988-89	2344	2276	2561	2428	2107	2877	5093	6734	8896	5453	3240	2774	46783
1989-90	2735	2212	2025	2252	2052	2258	4032	6231	8956	7339	3595	2559	46246
1990-91	2264	1887	1761	1780	1551	2675	2381	6090	14240	10072	4214	2975	51890
1991-92	1949	2128	2010	1995	2062	2102	3921	9524	7672	5213	3607	2278	44461
1992-93	2028	2080	2206	2819	2341	2583	3605	11888	17907	18746	8809	3563	78575
1993-94	2162	1818	2032	1804	1829	2176	3640	8509	12265	7245	3889	2920	50289
1994-95	3855	2415	2331	3437	2357	4129	3826	8047	21531	33241	19359	8813	113341
1995-96	4047	2967	3325	3171	3535	3677	5735	13617	21594	17572	10010	4721	93971
1996-97	3192	3678	3799	6110	3220	4116	6572	17619	19068	12843	7886	4680	92783
1997-98	3033	3025	3283	3087	3585	3385	4026	7002	19400	29141	13644	7994	100605
1998-99	3612	3672	2923	2834	2773	3065	3432	11193	15874	10355	5355	3541	68629
1999-00	2568	2058	1973	2306	2619	3024	3811	12227	16161	8353	5302	2929	63331
2000-01	2299	2468	2205	2303	2269	3232	4273	16884	11517	8166	4596	3141	63353
2001-02	2370	1973	2292	2500	2277	2064	3915	7555	12947	7674	3405	2326	51298
2002-03	2203	2736	2585	2428	2057	2426	3030	10681	17567	9512	4837	3023	63085
2003-04	1946	2114	2577	2503	2438	3568	4458	8992	13430	7693	4012	2373	56104
2004-05	2071	2381	2222	2860	2224	2700	3364	13853	18690	23606	9240	3181	86392
2005-06	2529	2363	3187	3079	2077	3225	3967	18152	27528	23814	8202	4238	102361
2006-07	3422	2846	2882	2704	2488	3085	4006	8621	7528	5551	3738	2749	49620
2007-08	2188	1784	2101	2658	2289	2412	3447	8628	12305	8596	3809	2446	52663
2008-09	2221	2454	2252	2294	2339	2633	3858	12375	11533	11686	4177	2613	60435
2009-10	2880	2118	2315	2484	1933	2299	3551	6333	21450	19011	5613	2572	72559
2010-11	3198	2802	4085	2902	2412	3435	5040	9617	20743	23622	12045	5288	95189
2011-12	4136	3079	2498	2571	2236	2574	4248	7446	6409	5325	4775	2697	47994
2012-13	2444	2147	2512	2259	1847	2282	3484	6513	6907	5132	3423	2113	41063
2013-14	1850	1704	1839	1723	1641	2066	3313	6219	7793	4571	3985	2123	38827
2014-15	1609	1526	1779	1745	1730	1976	2020	4569	6430	4840	2738	1785	32747
2015-16	2390	2057	1989	2128	2075	2554	3861	7848	16580	8205	3557	2005	55249
2016-17	2203	1979	2215	4043	3141	3150	5628	17429	36592	29709	13213	7006	126308
Average	2612	2370	2474	2662	2327	2818	3984	10013	15156	12837	6354	3497	67108

Source:

Table 3-4Figure 3-4 through Figure 3-6 represent the operating rule curve for mean, high and low water years. The area-capacity curves that are used by Project operators to manage reservoir elevation and discharge will be included in the model.

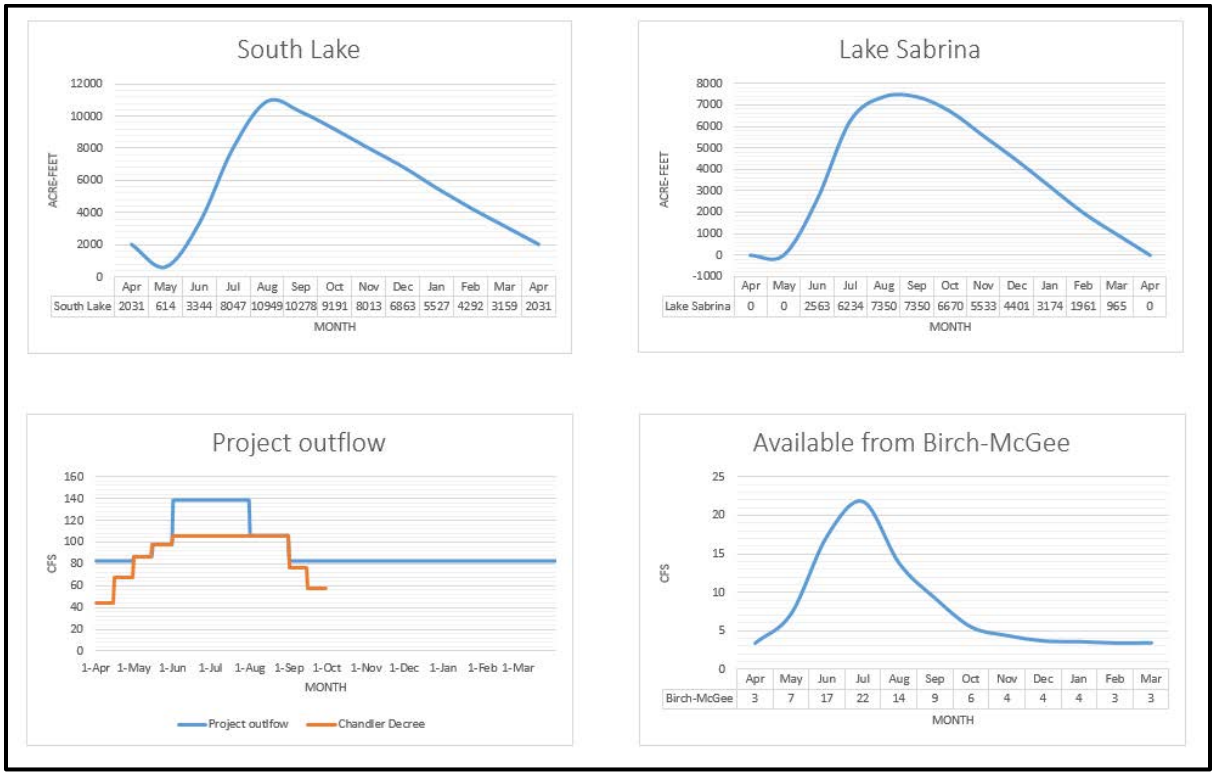

FIGURE 3-4 OPERATING RULE CURVE – MEAN WATER YEAR

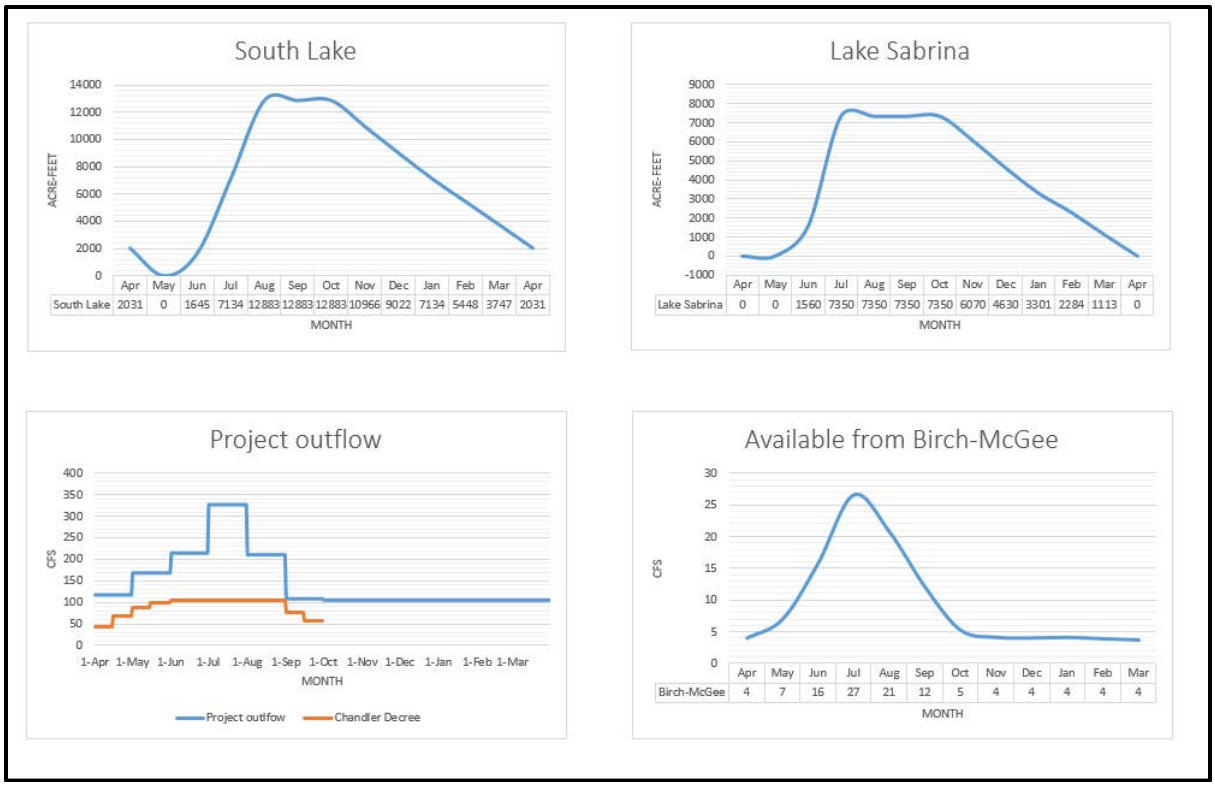

FIGURE 3-5 OPERATING RULE CURVE – HIGH WATER YEAR

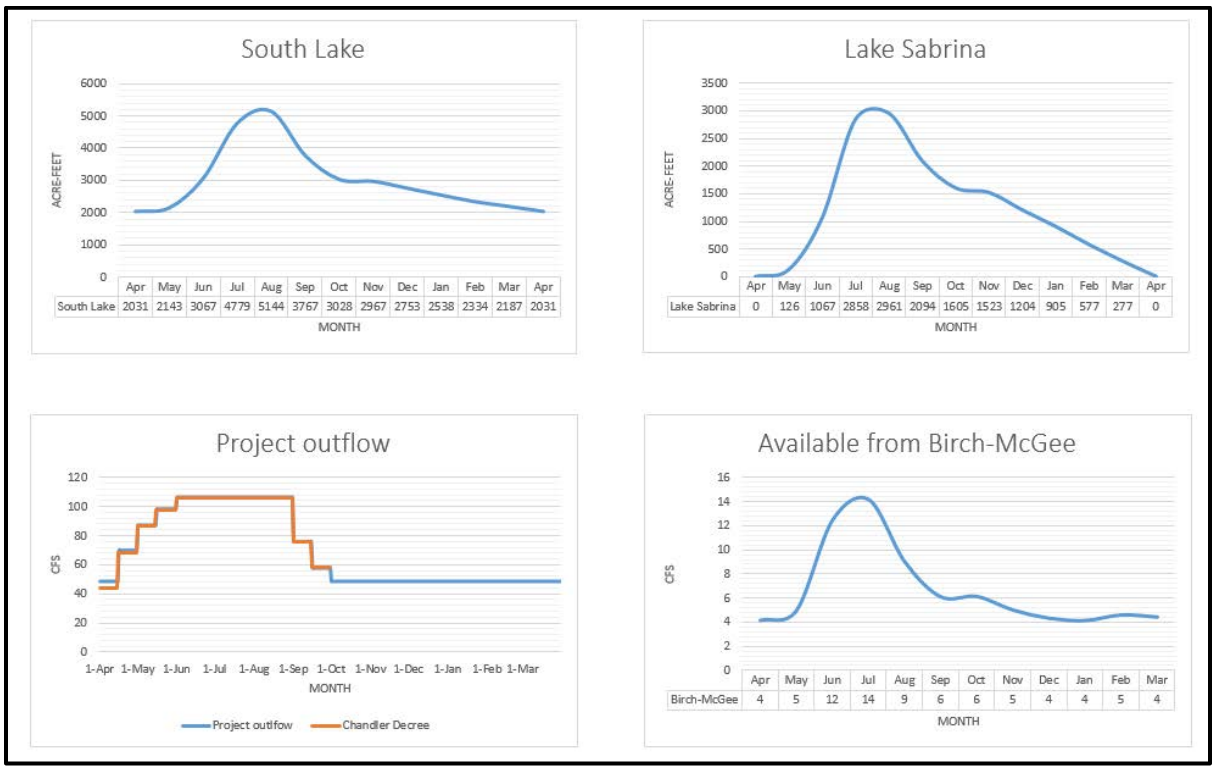

FIGURE 3-6 OPERATING RULE CURVE – LOW WATER YEAR

3.2.3.3 REGULATORY AND LEGAL CONSTRAINTS

Project operations are subject to adjudicated water rights and other agreements that provide for non-power uses. The Chandler Decree is one of the primary controlling documents. The Sales Agreement between Southern Sierra Power Company (predecessor to SCE) and LADWP addresses SCE's obligations with respect to the waters of Bishop Creek. Within these constraints, SCE manages the releases from the storage reservoirs, for purposes of hydro-generation and meeting water allocation requirements.

The Sales Agreement provides for seasonal maximum carry-over limits of 2147 acre-feet, as measured on or about April 1, annually. Variances from this requirement have been obtained on a case-by-case basis in the past, by mutual-agreement between SCE and LADWP. Additionally, SCE meets with USFWS annually to determine: 1) seasonal minimum storage requirements for recreation purposes; and 2) annual flushing flows.

The Chandler Decree and SWRCB water rights licenses determine how flows are allocated and used, as follows:

- Seasonal diversion and accumulation limit not to exceed historically measured use (i.e., not to exceed current Project capacity), including an annual limit of 1400-acre feet from Green Creek.
- Instantaneous diversion limit at all locations not to exceed historically measured use (i.e., not to exceed current Project capacity), including a daily average limit of one cfs for domestic use.
- Minimum Project flow-through (downstream delivery) requirements, for senior downstream water rights holders, are measured below Plant 6, as required by the Chandler Decree (Figure 3-7).
- Minimum instream flow requirement of 0.25 cfs at the Birch Creek diversion, for senior downstream water rights holders, as stipulated by the Chandler Decree
- Minimum instream flow requirement of 1.6 cfs during the irrigation season, and 0.4 cfs at other times, through the Abelour Ditch, for senior downstream water rights holders in the Rocking K Subdivision.

TABLE 3-7 DAILY AVERAGE FLOW REQUIREMENTS FOR FLOW BELOW PLANT 6

TIME PERIOD	DAILY AVERAGE FLOW (CFS)	INSTANTANEOUS MINIMUM FLOW (CFS)
April 1-15	44	33
April 16-30	68	51
May 1-15	87	65
May 16-31	98	74
June 1 - Jul 31	106	90
August 1-31	106	80
September 1-15	76	57
September 16-30	58	44

Source: Chandler Decree

In addition, there are required minimum instream flow requirements that are mandated by the Article 105 of the FERC license, as follows:

- **Lake Sabrina to Intake 2**: no less than 13 cfs or natural flows, whichever is less, year-round
- **South Lake to South Fork Diversion**: no less than 13 cfs or natural flows, whichever is less, year- round
- **Southfork Diversion:** no less than ten cfs from Friday of the last weekend in April thru October 31; no less than seven cfs for the remainder of the year
- **Intake 2:** no less than ten cfs from Friday of the last weekend in April thru October 31; no less than seven cfs for the remainder of the year; or no less than five cfs in all months in dry years
- **Plant 2 to Plant 3**: no less than 13 cfs year-round
- **Plant 3 to Plant 4**: no less than five cfs year-round
- **Plant 4**: no less than 12 cfs year-round (Article 105)[7]
- **McGee Creek Diversion**: no less than one cfs or the natural flow, whichever is less, year-round
- **Birch Creek Diversion**: no less than 0.25 cfs or the natural flow, whichever is less, year-round

[7] Article 114 required 18 cfs (or the natural streamflow, whichever is less), however this license condition was removed by order dated February 1, 1995 because of a conflict with the Energy Policy Act of 1992, which changed how the Federal Land Policy and Management Act (FLPMA) treated lands which had been previously subject to a reservation under Section 24 of the Federal Power Act. The remaining language in Article 105 ambiguous as to whether the minimum flow requirement is 12 cfs or some greater amount negotiated with the CDFW. Historically SCE has been releasing 18 cfs.

3.2.3.4 GENERATION NODES

The generation equipment at the Project includes five powerhouses and 14 units as depicted in Table 3-8. Each of these units can be operated independently. There exists some uncertainty regarding the effective generating potential for each unit, which can be limited by head, flow, mechanical or electrical constraints. Confirming these limits is one of the objectives of the study.

TABLE 3-8 PROJECT GENERATION EQUIPMENT BASED ON CURRENT EXHIBIT A (2002) AND SCE DATA BOOK

Plant Name	Unit Number	Unit Rated KW	Effective KW[1]	CFS Unit
	Bishop Creek			
Plant 2	1	2500	2600	45
	2	2500	2600	45
	3	2900	2600	45
Total		**7900**	**7800**	**135**
Plant 3	1	2750	2750	50
	2	2750	2750	50
	3	2750	2750	65
Total		**8250**	**8250**	**165**
Plant 4	1	1000	1000	19
	2	1000	1000	19
	3	2180	2100	29
	4	2180	2100	29
	5	2180	2100	29
Total		**8540**	**8300**	**125**
Plant 5	1	2500	2100	71
	2	2813	1700	59
Total		**4532**	**3800**	**130**
Plant 6	1	**2000**	**2000**	**150**
Bishop Creek Total	**14**	**32,003**	**30,015**	

Source: 2002 Exhibit A

[1] Values provided for "effective KW" are based on operator experience and will be confirmed as part of this study.

3.2.4 STUDY AREA

Figure 3-7 shows the proposed study area for the Bishop Creek Operations Model. The study would include all Project influenced waters including diverted reaches, bypass reaches and reservoirs.

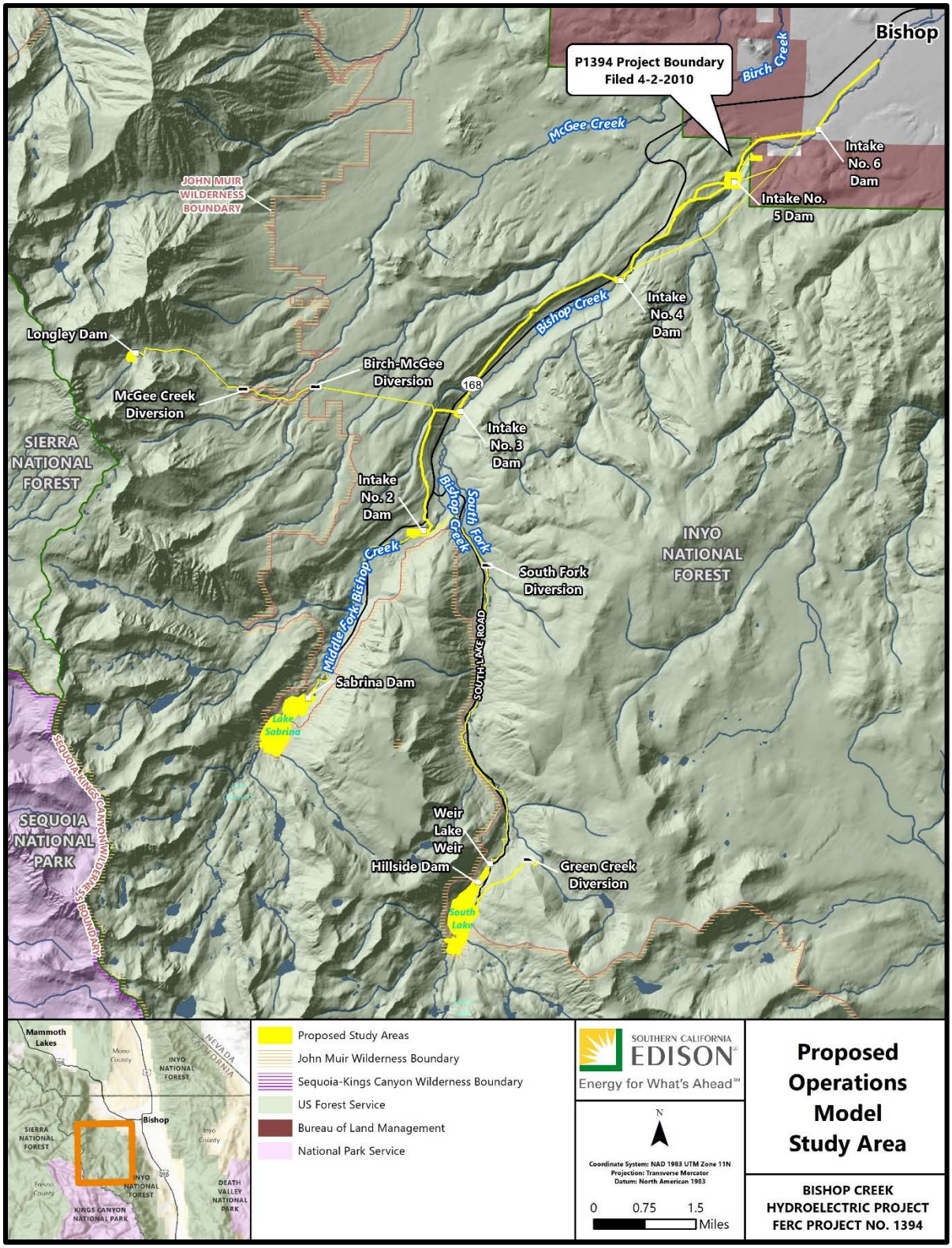

FIGURE 3-7 PROPOSED OPERATIONS MODEL STUDY AREA

3.2.5 METHODS

The Bishop Creek Operations model will combine physical attributes of each component within the system with basin hydrology to calculate effects of alternative operational scenarios. Results of the operations model outcomes will be used in the development of potential environmental measures effecting stakeholder interests. Legal constraints will be the prioritized logic for resource allocation within the operations model and will include legal and contractual requirements described by the Chandler Decree and the Sales Agreement between Southern Sierra Power Company and LADWP. For purposes of the operations model, these constraints will be considered constants that must be accommodated in all scenarios.

The platform for the operations model will be Microsoft Excel, which will provide a transparent format for stakeholders. Components of the Bishop Creek hydro system that will be represented within the Bishop Creek Operations model include reservoirs, diversions, tributaries and outlets, penstocks, and hydro stations.

Regulatory scenarios include bypass flow requirements below dams and diversions. These flow requirements, which originate from the IFIM studies conducted in the 1990s, will be the subject of additional analysis generated by the Instream Flow Condition Assessment Study Plan (Section 3.1).A current set of rule curves that describe how these constraints are incorporated for high, low and mean water years is depicted in Section 4 and will form the basic architecture for flow routing decisions produced by the operations model. A base scenario will be developed to simulate existing operations and historical conditions for calibrating the operations model, which will be used for comparing impacts associated with potential alternative scenarios.

The general sequence of steps to create and manage the Bishop Creek Operations model are:

1. Create schematic showing nodes interaction and the primary interactions between each node;
2. Quantify and incorporate physical, regulatory, and legal constraints for each node;
3. Populate model with historic flow datasets;
4. Calculate daily mean flows within and between each node based on existing operational procedures;
5. Calibrate against historic flow and generation records;

6. Develop documentation for the operation model's use, specifically variable inputs for alternative scenarios, which also describes the model configuration.

Because the hydrologic input dataset statistically impacts the outcome of model scenarios, the period of record will be reviewed with stakeholders based on available period of record, appropriate temporal resolution, and adequate representation of current resource utilization.

3.2.6 SCHEDULE, PERIODIC REPORTING AND ONGOING CONSULTATION

The anticipated Study Plan development and implementation schedule is identified in Table 3-9. As described in the PAD and NOI, SCE anticipates seeking an expedited Study Plan determination process for some plans or for portions of some.

TABLE 3-9 ANTICIPATED POST PAD/NOI STUDY PLAN DEVELOPMENT MILESTONES AND FERC PROCESS THROUGH STUDY PLAN DETERMINATION

TASK	RESPONSIBLE ENTITY	SCHEDULE MILESTONES
File NOI/PAD with FERC along with Final Study Plans	SCE	5/1/2019
FERC Holds Scoping and Site Visit	FERC	7/1/2019-7/31/2019
Deadline for Comments on PAD and Study Requests	Stakeholders	8/30/2019
Preliminary Field Season[1]	SCE	2019
Fall TWG Workshop	SCE & TWG	November, 2019
Request for waiver of 18 CFR 5.12 & 5.13	SCE	9/2/2019
FERC Director's Study Plan Determination (assumes waiver granted)	FERC	11/8/2019
First Field Season	SCE	2019
Initial Study Report (adjust as necessary in consultation with TWGs)	SCE	11/9/2020
Second Field Season (as necessary)	SCE	2020
Final Study Report	SCE	11/9/2021
License Application	SCE	June 2022

[1] Note: Because the 2019 field season precedes the Study Plan Determination is noted as "preliminary" because to avoid confusion with the FERC sequence of field season followed by Initial Study Report. For similar reasons, a fall TWG workshop is offered to review the results of the preliminary field season

This schedule is predicated on attaining agency agreement on the general goals, objectives and methods of the study, with the understanding that additional details may be resolved between the

filing of the PAD and NOI, and the deadline for stakeholders to file comments on the PAD and make study requests. As well, there are additional decisions and ongoing consultation needs throughout the implementation of the study. For this Study Plan, the outstanding items for consultation are listed in Table 3-10. This table distinguishes between those items that require resolution before the study can be implemented, and those that would be the subject of ongoing consultation with the appropriate TWG.

TABLE 3-10 ANTICIPATED ADDITIONAL CONSULTATION TASKS

IMPLEMENTATION DETAIL FOR RESOLUTION	SCHEDULE FOR RESOLUTION
Review of model operations, functions, and capabilities	Prior to Study Plan Determination
Agreement on input/output formats	Prior to Study Plan Determination
Model runs as needed	During and following first study season

3.2.7 STUDY PLAN CONSULTATION RECORD

This Study Plan was developed in consultation with the Bishop Creek Aquatic Resources TWG. The intent of the consultation process is to achieve consensus, to the degree possible, regarding 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 section summarizes the key consultation milestones for each Study Plan (Table 3-11), and how SCE addressed the comments received through the consultation process. Table 3-12 is a Response to Comments Table for comments received from stakeholders, and how comments have been addressed in the final Study Plan. If a stakeholder's comment was not incorporated, Table 3-12 would provide a rationale based on Project specific information and FERC's Study Plan Criteria (18 CFR § 5.9).

TABLE 3-11 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
Revised Study Plans	11/15/2018	TWG	12/4/2018 to 12/6/2018	1/7/2019
Proposed Study Plans (filed with PAD)	5/1/2019	TWG	6/12/2019 and 6/19/2019	7/12/2019

TABLE 3-12 SCE RESPONSES TO COMMENTS RECEIVED ON STUDY PLAN

COMMENT NO.	DATE OF COMMENT	ENTITY	COMMENT	SCE RESPONSE
1	8-29-2018	CDFW	A separate operations model should be developed in concert with a flow habitat study	Integration with other relicensing studies is a key objective of this plan. The aquatics TWG and the IFIM study lead will be involved in reviewing the Study Plan and its operational scenarios.
2	8-31-2018	INF	Propose edits to study objectives: • Develop working model of Bishop Creek Project to include System inflows, outflows, and generation nodes. • Align model with needs of other relicensing studies and information needs. Develop procedures to configure model for alternative operational scenarios and document results.	SCE agrees with proposed edits and have incorporated into this draft plan

COMMENT NO.	DATE OF COMMENT	ENTITY	COMMENT	SCE RESPONSE
3	9-4-2018	State Water Resources Control Board (SWRCB)	SWRCB Staff Support this study	Comment noted
4	1-19-2019	CDFW	The format of the model be specified in the Study Plan. The model should be transparent and accessible to agency staff to allow for better decision-making regarding flows.	SCE will provide screenshots of the basic input and output screens and will collaborate with the TWG on a template for providing specifications (scenarios) and for reporting results. SCE has concerns about providing direct access to the model, but will have structure, formula, and parameters transparent. The modeler will be able to answer questions and run scenarios that are requested.
5	1-19-2019	CDFW	The summary of flow requirements and water rights provided in the Sediment Modeling Approach should be included in the Operations Model as well.	This information has been included in the revised Study Plan.
6	6-11-2019	TWG conference call	Discussion about need to provide information and field assessment of potential Project effects of stream reaches below Birch and McGee diversions.	Unlike Bishop Creek, these streams are remote, and are reported to maintain incidental self-sustaining populations of non-native brook and brown trout for which there are no published management objectives. Agencies have not identified any specific habitat or management objectives that the current flow is failing to provide. The concern articulated seemed more focused on documenting what is there. SCE has updated this Study Plan to help address questions of potential effects without the level of effort and complexity of an instream flow study. Instead a flow demonstration study is described, which is more appropriate for the size and complexity of these diverted reaches.

3.2.8 REFERENCES

Chandler Decree 1922 (Chandler Decree). Hillside Water Company v. William A. Trickey et.al, U.S. District Court, Southern Division of California (Northern Division), No. B-61 EQ, Final Decree in Equity (Chandler Decree), January 27, 1922 (Unreported).

United States Department of Agriculture (USDA). 2018. Land Management Plan for the Inyo National Forest. https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd589652.pdf.

3.3 BISHOP CREEK FISH DISTRIBUTION BASELINE STUDY PLAN (AQ 3)

3.3.1 PROJECT NEXUS AND RATIONALE FOR STUDY

During these TWG meetings, stakeholders identified the need for a Baseline Fish Distribution Study Plan that focus on creeks below Project reservoirs. The goal will be to investigate the effects of Project operation, including the current minimum instream flow releases and channel maintenance flows on resident fish and aquatic habitat in Project affected stream reaches.

A separate effort will be described that examines fish distribution in the reservoirs. This Study Plan details SCE's proposal for study objectives, study area, methods and schedule for the effort.

Project operations may indirectly or directly influence fish resources occupying Project waters, primarily by regulating reservoir water levels or by flows throughout the creek basin. The effect may be direct (e.g., altered hydrology due to flow management), or indirect (e.g., public access to Project areas). Future Project facilities and operations should not be inconsistent with the Desired Conditions described in the Land Management Plan for the Inyo National Forest (USDA 2018) as they relate to ecological sustainability and diversity of plant and animal communities. Therefore, this Study Plan focuses on identifying the presence and distribution of fish species within the Project area that may be affected.

3.3.2 STUDY GOALS AND OBJECTIVES

Study goals and objectives are determined based on input received in consultation with stakeholders participating in the Aquatic Resources TWG during the period of March 2018 through August 2018, information reviewed from SCE files, and a Project area site visit during June 2018 and written comments received by August 31, 2018. The TWG stated that there is no current information regarding the distribution of both game and non-game fish species of interest in the Project area; nor is the status known regarding the growth and density of wild brown trout populations in the Project area. Study Plan goals and objectives include:

- Characterize fish populations and distribution in Project influenced stream reaches
  - Sample for Owens sucker in Bishop Creek downstream from Lake Sabrina and South Lake
  - Assess distribution of other fish species in Bishop Creek downstream from Lake Sabrina and South Lake

  - Obtain population date sufficient to identify the extent to which self-sustaining brown trout populations are consistent with levels documented during the 1990s through 2010 at historic monitoring sites
  - Evaluate population, health and condition of recreationally important brown trout and brook trout in lotic habitat affected by Project operation via added monitoring of the historic monitoring sites
- Evaluate select, localized water quality parameters that may affect the growth and distribution of fish species
- Ensure that future Project facilities and operations are not inconsistent with the Desired Conditions described in the Land Management Plan for the Inyo National Forest (USDA 2018) as they relate to ecological sustainability and diversity of plant and animal communities.

3.3.3 PERTINENT LIFE HISTORY INFORMATION

CDFW currently manages waters in the Project area as a popular stocked rainbow trout fishery, and Bishop Creek presently supports a self-sustaining brown trout fishery. McGee and Birch creeks maintain small brook and possibly brown trout populations. Introduced species such as Owens sucker and speckled dace may potentially be occupying Project waters.

3.3.3.1 BROWN TROUT

Brown trout are an introduced species to the Bishop Creek watershed that has established a self-sustaining fishery, supported entirely by natural reproduction. Spawning recruitment to the fishery does not appear to be a limiting factor (N. Buckmaster, CDFW, *personal communication*). The following summary of brown trout life history is excerpted from Raleigh et al. (1986).

> *Brown trout mature as early as the end of their first year and as late as their eighth year but most mature in their third to fifth year. Brown trout up to 30.0 cm in length feed generally on terrestrial and aquatic insects but, as they exceed 25.0 cm, fish and crustaceans become more important in the diet. Brown trout are fall spawners with apparent latitudinal differences in time of onset. Spawning migrations appear to be triggered by decreasing day length, increased late fall flows, or drops in water temperature to <9 ^{o}C though these events are usually concurrent. In California, however, spawning often occurs when stream flows are low. Eggs are buried in unguarded nests (redds) built in well aerated gravels where they incubate throughout the winter. Egg sac larvae live in the gravels prior to emerging as fry in the spring.*
>
> *Optimal brown trout riverine habitat is characterized by clear, cool to cold water; a relatively silt-free rocky substrate in riffle-run areas; a 50% to 70% pool to 30% to 50%*

> *riffle-run habitat combination with areas of slow, deep water; well vegetated, stable stream banks; abundant instream cover; and relatively stable annual water flow and temperature regimes. Brown trout tend to occupy the lower reaches of low to moderate gradient areas (~1%) in suitable, high gradient river systems.*

3.3.3.2 OWENS SUCKER

Owens sucker have been introduced to the Bishop Creek watershed, and specifically are known to occupy Lake Sabrina. It is not known if they have colonized other portions of the watershed. The species occupies waters specifically in the Owens River Valley but has escaped via the Owens Aqueduct to the Santa Clara River drainage.

The species prefers soft-bottomed runs in cool-water streams and the bottoms of lakes and reservoirs. Owens suckers feed at night on aquatic insects, algae, detritus and organic matter. They spawn from early May through early July. Larval suckers become juveniles at a total length (TL) of 19 millimeters (mm) to 22 mm and hide under cover along stream margins and in backwaters. According to CDFW (n.d.):

> Owens suckers, in the Owens River … are most common in stream reaches with long runs and few riffles. Habitat in these reaches is characterized by fine substrate…with lesser amounts of gravel and cobble, water temperatures of 7-13°C, and pH of 7.9-8.0. In lakes and reservoirs, … adults are abundant near the bottom, regardless of depth. Adult suckers (> 15 cm) were also commonly found at the bottom of pools in a 10-mile reach of the Owens River Gorge. Recent surveys in the lower Owens River found suckers predominantly in off-channel habitats, such as backwaters.

3.3.4 REVIEW OF EXISTING INFORMATION

Project facilities (13 dams and diversions, and five powerhouses and associated intakes) are sited along Bishop Creek and its tributaries as well as Birch and McGee creeks. Bishop Creek has a total drainage area of approximately 70-square-miles from its headwaters to the confluence with the Owens River. South Lake and Lake Sabrina are the major storage reservoirs in the watershed. SCE manages the releases from the storage reservoirs, for purposes of hydro-generation and meeting water allocation requirements in accordance with the Chandler Decree. Water from McGee and Birch creeks (combined drainage area of approximately 25-square-miles) is also diverted to Bishop Creek through the hydroelectric facilities.

This network of creeks and reservoirs supports both stocked and self-sustaining trout fisheries, including brown trout, brook trout and rainbow trout managed by the CDFW. The CDFW introduced these trout, which are managed to support an angling harvest. All three species are nonindigenous, and stocking is required to support heavy angling exploitation for the put and take fishery in the reservoirs. Segments of the lower reaches of Bishop Creek support self-sustaining brown trout populations, and McGee and Birch creeks maintain scattered populations of brook trout. Owens sucker are believed to have been informally introduced (N. Buckmaster, CDFW, *personal communication*), and during an early June 2018 field visit to Lake Sabrina, adult Owens sucker were observed spawning in a shallow arm near the eastern end of the Lake Sabrina dam. EA (1987) netted an unidentified sucker from Lake Sabrina, which the authors speculated were Owens sucker. Edison monitored the Bishop Creek brown trout population at intervals from 1988 through 2010 (Sada and Rosamond 2010). Sada and Rosamond (2010) found that population parameters such as growth, age and abundance remained similar to that of other regional Sierra creeks throughout most of the study period, however abundance declined during 2010, the last year of monitoring. CDFW noted that growth of adults was limited in recent years but that recruitment from natural reproduction does not appear to be a limiting factor (N. Buckmaster, CDFW, *personal communication*).

3.3.5 STUDY AREA

Figure 3-8 shows the proposed study area for the Study Plan. The study would be conducted downstream from South Lake, Sabrina Lake and select Bishop Creek bypass reaches.

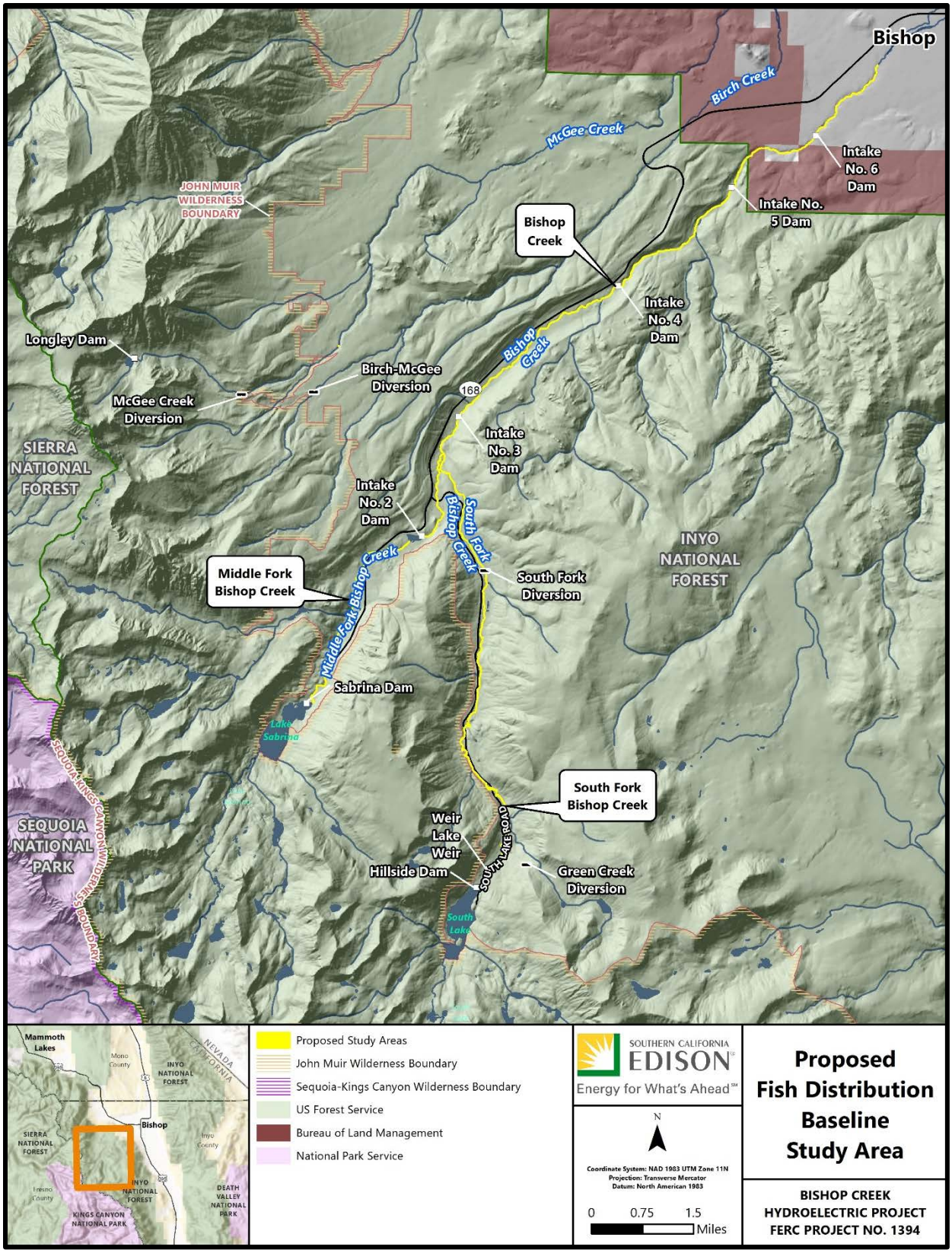

FIGURE 3-8 PROPOSED FISH BASELINE DISTRIBUTION STUDY AREA

3.3.6 METHODS

1. *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 detritovores that prefer pools and runs with sediments and fine substrates. SCE will target likely habitat for further sampling. SCE assumes that natural pools and forebays would be the primary focus of this investigation, although other areas will be surveyed as part of Objective 2 below.

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

      Sampling will be included as a component of the overall fishery survey outlined below in Objective 2.

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

      SCE will document basic biometric information, such as numeric abundance, length (TL or fork length [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 (DO), pH and conductivity water clarity.

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

      SCE will sample in late spring and in early fall. The fall sample will allow any young of year (YOY) specimens to grow to a detectable size and occur prior to the fall trout spawning period.

2. *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. CDFW believes that Owens sucker and speckled dace may potentially occupy Bishop Creek downstream from Plant 4. Although not reported to occur in the Project area, the presence and abundance of any endangered Owens-Tui chubs will be documented and analyzed should they occur.

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 in each branch of Bishop Creek below the reservoirs and in fluvial habitat below selected forebay diversion dams, subject to access and safety considerations, and include historic long-term monitoring sites employed by Sada and Rosamond (2010). Each site will be selected based on habitat characteristics in consultation with CDFW and USFS. SCE will conduct a single-season sampling effort, scheduled to occur in late summer or early fall and to the extent possible. 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 wading areas using backpack electrofishing techniques. Trap nets and/or gill nets will be deployed in deeper 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 1, 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 (*retain voucher specimen(s) for species not previously reported*)
- make qualitative observations regarding the presence of aquatic macroinvertebrates

3. *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 and Rosamond (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 and Rosamond (2010).

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

- Re-measure habitat parameters to determine if sites are still comparable to historic conditions.
- Record general description of substrate, cover, presence of woody debris at each sampling site and evidence of forage such as aquatic macroinvertebrates.

- Review macrohabitat factors (e.g. climatic and streamflow) for at least three years prior to survey to identify or rule out large-scale abiotic perturbations that could influence Bishop Creek aquatic populations.
- Replicate sampling methods, data collection and analysis performed by Sada and Rosamond (2010). This includes population metrics such as length and weight at age and density (number of fish per unit area of stream).
- Analyze identical metrics to Sada and Rosamond (2010)
- Statistical analysis to determine:
  - degree of similarity/dissimilarity to past data sets
  - the extent of any variability in the data

4. *Evaluate select, localized water quality parameters that may affect the growth and distribution of fish species.*
   a. The study will gather concurrent *in situ* water quality parameters during all sampling events. This will provide localized data describing water quality at stations where quantitative fish sampling occurs as discussed above under objectives 1 and 2 and will include temperature, dissolved oxygen, pH and conductivity. These data will supplement and compliment the water quality data gathered under the Water Quality Study Plan, which will gather data on the same parameters as well as others as described under that plan.
5. *Ensure that future Project facilities and operations are not inconsistent with the Desired Conditions described in the Land Management Plan for the Inyo National Forest (USDA 2018) as they relate to ecological sustainability and diversity of plant and animal communities.*
   a. The study process will provide the data that documents the extent to which the aquatic community is ecologically sustainable by assessing the growth and health and relative abundance of wild brown trout, brook trout and Owens sucker in the Bishop Creek watershed.

3.3.7 SCHEDULE, PERIODIC REPORTING, AND ONGOING CONSULTATION

The anticipated Study Plan development and implementation schedule is identified in Table 3-13. As described in the PAD and NOI, SCE is anticipates seeking an expedited Study Plan determination process for some plans or for portions of some plans.

TABLE 3-13 ANTICIPATED POST PAD/NOI STUDY PLAN DEVELOPMENT MILESTONES AND FERC PROCESS THROUGH STUDY PLAN DETERMINATION

TASK	RESPONSIBLE ENTITY	SCHEDULE MILESTONES
File NOI/PAD with FERC along with Final Study Plans	SCE	May 1, 2019
FERC Holds Scoping and Site Visit	FERC	July 1, 2019-July 31,2019
Deadline for Comments on PAD and Study Requests	Stakeholders	Aug 30, 2019
Preliminary Field Season[1]	SCE	2019
Fall TWG Workshop	SCE & TWG	Nov 2019
Request for waiver of 18 CFR 5.12 & 5.13	SCE	Sep 2, 2019
FERC Director's Study Plan Determination (assumes waiver granted)	FERC	Nov 8, 2019
First Field Season	SCE	2019
Initial Study Report (adjust as necessary in consultation with TWGs)	SCE	Nov 9, 2020
Second Field Season (as necessary)	SCE	2020
Final Study Report	SCE	Nov 9, 2021
License Application	SCE	June 2022

[1] Note: Because the 2019 field season precedes the Study Plan Determination is noted as "preliminary" because to avoid confusion with the FERC sequence of field season followed by Initial Study Report. For similar reasons, a fall TWG workshop is offered to review the results of the preliminary field season

This schedule is predicated on attaining agency agreement on the general goals, objectives and methods of the study, with the understanding that additional details may be resolved between the filing of the PAD and NOI, and the deadline for stakeholders to file comments on the PAD and make study requests. As well, there are additional decisions and ongoing consultation needs throughout the implementation of the study.

For this Study Plan, the anticipated implementation sequence is identified in Table 3-14.

TABLE 3-14 ANTICIPATED IMPLEMENTATION SEQUENCE

TASK	SCHEDULE FOR IMPLEMENTATION
Selection of sampling sites	June or July 2019
Late summer/early fall data collection	Fall, 2019
Spring data collection	Spring 2020
Consultation on statistical analyses	Following fall study season
Data analysis and draft report	Mid-2020

3.3.8 STUDY PLAN CONSULTATION RECORD

This Study Plan was developed in consultation with the Bishop Creek Aquatic Resources 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 section summarizes the key consultation milestones for each Study Plan (Table 3-15), and how SCE addressed comments received through the consultation process. Table 3-16 is a Response to Comments Table for comments received from stakeholders, and how comments were addressed in the final Study Plan. If a stakeholder's comments were not incorporated, Table 3-16 will provide a rationale based on Project specific information and FERC's Study Plan Criteria (18 CFR § 5.9).

TABLE 3-15 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
Revised Study Plans	11/15/2018	TWG	12/4/2018 to 12/6/2018	1/7/2019
Proposed Study Plans (filed with PAD)	5/1/2019	TWG	6/12/2019 and 6/19/2019	7/12/2019

TABLE 3-16 SCE RESPONSES TO COMMENTS RECEIVED ON STUDY PLANS

COMMENT NO.	DATE OF COMMENT	ENTITY	COMMENT	SCE RESPONSE
1	8/29/2018	Nick Buckmaster, California Department of Fish & Wildlife	Fish distribution and population studies should be considered separate.	This will be addressed narratively within the existing study to make it clear that both components will be addressed and reported on separately.
2	8/29/2018	Nick Buckmaster, California Department of Fish & Wildlife	Fish population studies should include determination of limiting factors for wild trout in Bishop Creek (e.g. bioenergetics constraints on growth, habitat, recruitment, angling pressure).	The scope of this request needs discussion relative to the nexus to the Project. Determining limiting population factors at the watershed scale would require significant effort, given the many environmental, biological and temporal variables (many unrelated to Project operation) that could affect the populations. How would CDFW propose using results of study? SCE proposes to address inferentially within context of fish distribution, water quality, sediment transport, and population study.

COMMENT NO.	DATE OF COMMENT	ENTITY	COMMENT	SCE RESPONSE
				Proposed study would focus effort on reaches below Plant 4 which seems to be of most interest to both CDFW and SCE.
3	8/29/2018	Nick Buckmaster, California Department of Fish & Wildlife	Studies should be separated into "riverine" and "reservoir" categories.	SCE agrees that these studies should be separated. Please see Bishop Creek Reservoirs Baseline Fish Distribution Study.
4	8/29/2018	Nick Buckmaster, California Department of Fish & Wildlife	A separate assessment of angler catch/ fishery exploitation should be included (overlap with recreation TWG).	Data will be collected as creel census information under the recreation survey study scope.
5	8/31/2018	Tristan Leong, USFS	Proposed objective: characterize fish populations and distribution in Project reservoirs and Project affected stream reaches.	SCE will revise objectives to characterize fish populations and distribution with respect to age-classes, size distribution and Catch per unit effort data. SCE does not think that fish population estimates, or recruitment/mortality metrics are warranted, given current fisheries management focus on put-take fisheries and the large geographic scope.
6	8/31/2018	Tristan Leong, USFS	Proposed modifying existing objective to "evaluate population, health, and condition of recreationally important trout populations in Project affected stream reaches; compare current estimate to previous monitored data.	SCE agrees that this objective can be modified if the focus is on self-sustaining populations of brown trout and brook trout in lotic habitat affected by Project operation. SCE would propose to evaluate by sampling the historic monitoring sites.
7	10/10/2018	CDFW	Determine trout age classes from scale samples rather than inferring from length; identify aquatic amphibian species encountered during sampling.	SCE concurs and will add this to the study scope.
8	10/10/2018	CDFW	Sample two seasons (spring and early fall)	SCE concurs and will add this to the study scope.

COMMENT NO.	DATE OF COMMENT	ENTITY	COMMENT	SCE RESPONSE
9	2/26/2019	Kary Schlick, USFS	Add aquatic species listed as an attached document here, so that it is showing that FERC addressed all species, typically ones that do not occur or are not expected (like we did with Wildlife Study Plan). As an appendix is fine, just so it is documented that we considered all that are currently required for INF to evaluate.	
10	8/22/2019 (via phone call)	Susan Monheit SWCB	Proposes sampling for Owens Tui Chub using environmental DNA (eDNA) to determine presence/absence in Project Area	SCE believes the effects of the Project are already addressed through existing study. The Baseline Fish Distribution and Abundance studies will be conducted throughout stream reaches and as part of this effort crews will be looking for chub as well as amphibians. SCE has developed these resources studies in close consultation with CDFW and the USFWS whose management objectives are closely assigned with this resource, and these agencies have not expressed a need for this level of effort over SCE's already planned (and agency reviewed) efforts. SCE requested, in December 2018, study requests that address criteria of 18 CFR § 5.9 that outlines the need for this study. To date, no such rational has been provided that would justify use of eDNA.

3.3.9 REFERENCES

California Department of Fish and Wildlife (CDFW). n.d. "Owens Sucker: *Catostomus fumeiventris* (Miller)." https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=104359. Accessed March 22, 2019.

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N. Buckmaster, California Department of Fish and Wildlife (CDFW). Personal Communication

Raleigh, R. F., Zuckerman, L.D., and Nelson, P.C. 1986. Habitat suitability index models and instream flow suitability curves: Brown trout, revised. U.S. Fish Wildlife Serv. Biol. Rep. 82(10.124), 65.

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

United States Department of Agriculture (USDA). 2018. Land Management Plan for the Inyo National Forest. https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd589652.pdf.

3.4 BISHOP CREEK RESERVOIRS BASELINE FISH DISTRIBUTION STUDY PLAN (AQ 4)

3.4.1 PROJECT NEXUS AND RATIONALE FOR STUDY

During TWG meetings, stakeholders identified the need for a Baseline Fish Distribution Study Plan to focus on Project reservoirs. The goal of this study is to evaluate the effects of Project operation on fish populations in Project reservoirs. A separate effort will be described that examines fish distribution in the creeks below the reservoirs and diversions. This Study Plan details SCE's proposal for study objectives, study area, methods and schedule for the effort. Project operations may indirectly or directly influence fish resources occupying Project waters, primarily by regulating water levels of the reservoirs or by flows throughout the creek basin. The effect may be direct (e.g., altered hydrology due to flow management), or indirect (e.g., public access to Project areas). Future Project facilities and operations should not be inconsistent with the Desired Conditions described in the Land Management Plan for the Inyo National Forest (USDA 2018) as they relate to ecological sustainability and diversity of plant and animal communities. Therefore, this Study Plan focuses on identifying the presence and distribution of fish species within the two reservoirs (South Lake and Lake Sabrina) within the Project area that may be affected.

3.4.2 STUDY GOALS AND OBJECTIVES

Study goals and objectives were determined based on input received in consultation with stakeholders participating in the Aquatic Resources TWG during the period of March 2018 through June 2018, information reviewed from SCE files, a Project area site visit during June 2018, the TWG input obtained on August 14, 2018, and written comments received by August 31, 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. Study Plan goals and objectives include:

- Characterize populations and status of fish species in Lake Sabrina and South Lake
  - Document presence and/or absence of Owens Sucker in Lake Sabrina and South Lake
  - Assess distribution of other fish species in Project reservoirs
- Evaluate select, localized water quality parameters that may affect the growth and distribution of fish species

- Ensure that future Project facilities and operations are not inconsistent with the Desired Conditions described in the Land Management Plan for the Inyo National Forest (USDA 2018) as they relate to ecological sustainability and diversity of plant and animal communities

3.4.3 PERTINENT LIFE HISTORY INFORMATION

The CDFW initially introduced fish species, and currently manages reservoirs in the Project area as a popular stocked reservoir rainbow trout fishery, and wild brown trout and brook trout fishery in stream segments. The Project reservoir lakes provide a heavily stocked put-and-take rainbow trout fishery. The abundance of rainbow trout in the reservoirs is a function of stocking intervention and angler exploitation rates; residency time for stocked rainbow trout in the reservoirs is believed to be very short lived (N. Buckmaster, CDFW, *personal communication*). In addition, Owens sucker, a California species of special concern, has been known to be illegally introduced into Lake Sabrina. Wild brown trout and brook trout from tributary headwater creeks upstream of the reservoirs may drop into the reservoirs and occupy these reservoirs.

OWENS SUCKER

Owens sucker have been introduced to the Bishop Creek watershed, and specifically are known to occupy Lake Sabrina. It is not known if they have colonized other portions of the watershed. The species occupies waters specifically in the Owens River Valley but has escaped via the Owens Aqueduct to the Santa Clara River drainage.

The species prefers soft-bottomed runs in cool-water streams and the bottoms of lakes and reservoirs. Owens suckers feed at night on aquatic insects, algae, detritus and organic matter and spawn from early May through early July. Larval suckers become juveniles at a TL of 19 mm to 22 mm and hide under cover along stream margins and in backwaters. According to CDFW (n.d.):

> *Owens suckers, in the Owens River … are most common in stream reaches with long runs and few riffles (Deinstadt et al. 1986). Habitat in these reaches is characterized by fine substrate…with lesser amounts of gravel and cobble, water temperatures of 7-13^{O}C, and pH of 7.9-8.0. In lakes and reservoirs, … adults are abundant near the bottom, regardless of depth. Adult suckers (> 15 cm) were also commonly found at the bottom of pools in a 10-mile reach of the Owens River Gorge (CDFW snorkel surveys 2008; S. Parmenter, CDFW, pers.*

comm. 2009). Recent surveys in the lower Owens River found suckers predominantly in off-channel habitats, such as backwaters (M. Hill, pers. comm. 2009).

3.4.4 REVIEW OF EXISTING INFORMATION

Owens sucker is a state of California species of special concern. It has no federal classification; therefore, there is no formal species management plan.

Project facilities (13 dams and diversions, and five powerhouses and associated intakes) are sited along Bishop Creek and its tributaries as well as Birch and McGee creeks. Bishop Creek has a total drainage area of approximately 70-square-miles from its headwaters to the confluence with the Owens River. South Lake and Lake Sabrina are the major storage reservoirs in the watershed. SCE manages the releases from the storage reservoirs, for purposes of hydro-generation and meeting water allocation requirements in accordance with the Chandler Decree. Water from McGee and Birch creeks (combined drainage area of approximately 25-square-miles) is diverted to Bishop Creek through the hydroelectric facilities.

This network of creeks and reservoirs supports both stocked and self-sustaining trout fisheries, including brown trout, brook trout and rainbow trout managed by CDFW. All three species are nonindigenous, and stocking is required to support heavy angling exploitation for the put and take fishery. The CDFW introduced these trout, which are managed to support an angling harvest. Segments of the lower reaches of Bishop Creek support self-sustaining brown trout populations, and McGee and Birch creeks maintain scattered populations of brook trout. Owens sucker are believed to have been informally introduced (N. Buckmaster, CDFW, *personal communication*), and during an early June 2018 field visit to Lake Sabrina, adult Owens sucker were observed spawning in a shallow arm near the eastern end of the Lake Sabrina dam. EA (1987) netted an unidentified sucker from Lake Sabrina, which the authors speculated were Owens sucker. Edison monitored the Bishop Creek brown trout population at intervals from 1988 through 2010 (Sada and Rosamond 2010). Sada and Rosamond (2010) found that population parameters such as growth, age and abundance remained similar to that of other regional Sierra creeks throughout most of the study period; however, abundance declined by 2010, the last year of monitoring.

3.4.5 STUDY AREA

Figure 3-9 shows the proposed study area for the Bishop Creek Reservoirs Fish Distribution Study Plan. The study would be conducted in South Lake and Lake Sabrina, and in Longley Reservoir.

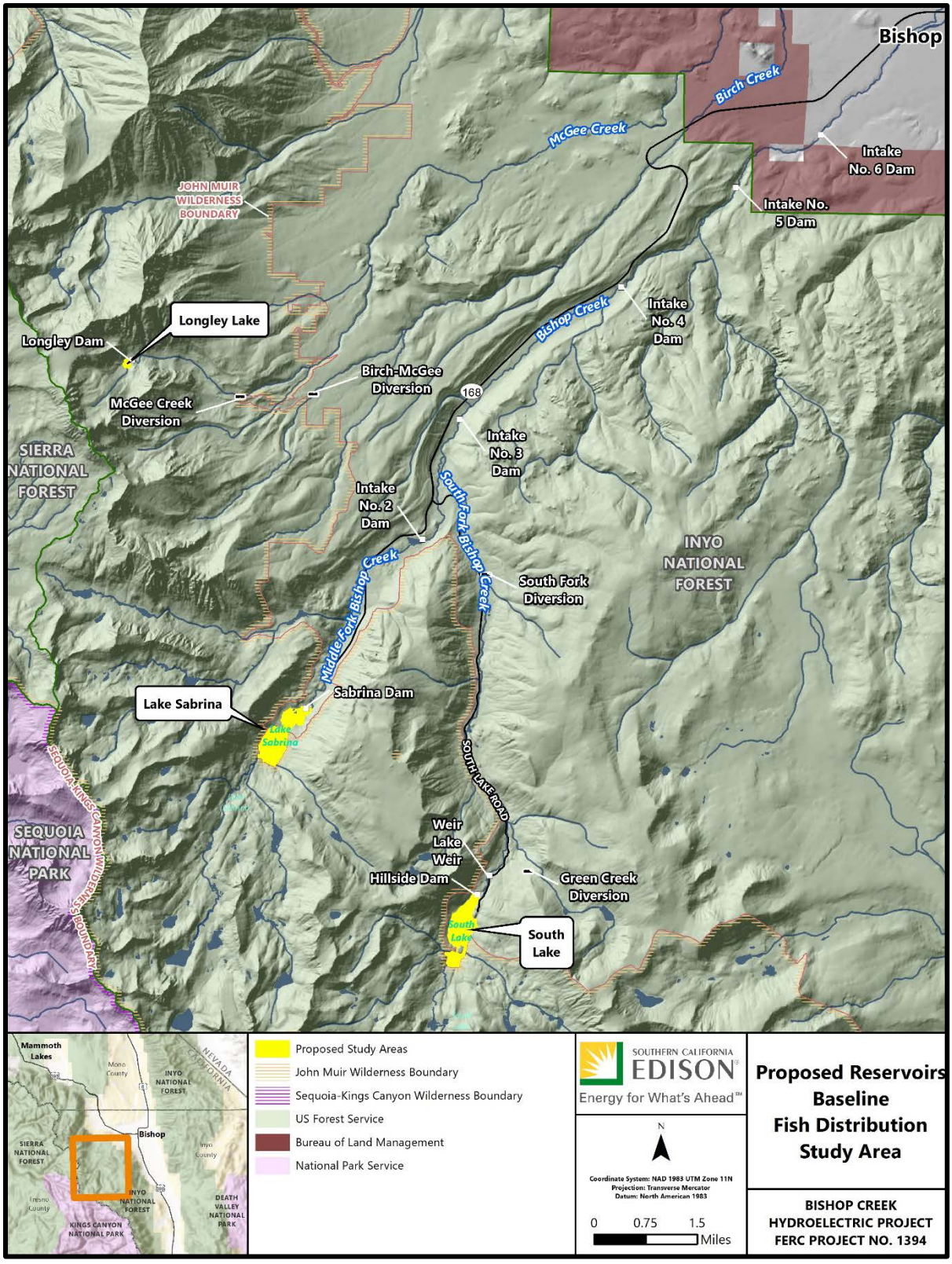

FIGURE 3-9 PROPOSED BASELINE FISH DISTRIBUTION STUDY AREA

3.4.6 METHODS

6. *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. CDFW and USFS biologists speculated that the species may have been introduced into South Lake and Lake Sabrina (March 2018 stakeholder meeting, *personal communication*). A group of spawning adults was subsequently observed during the June 2018 site visit to Lake Sabrina, and CDFW reports obtaining DNA samples from this population in the past during the spawning run (Steve Parmenter, CDFW, *personal communication*, August 14, 2018). SCE proposes the following study methods to further characterize the population 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 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 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 (TL or FL), weight, gender and spawning condition. Operculum bony material will be obtained from up to 30 adults and made available to CDFW for age determination, however this will require sacrificing each of these fish. The method of collection will be determined in consultation with CDFW but is anticipated to include methods such as boat electrofishing or trap netting. All specimens not needed for age determination will be returned alive to the source water immediately following processing.

7. Collect additional Owens sucker population and fish assemblage data

SCE will boat electrofish littoral habitat along each reservoir. Sampling will occur once in late spring to coincide with the *Task D,* Owens sucker spawning investigation and again, between late August and mid-September. This will be late enough for spring-hatched YOY life stage fish to have grown sufficiently to be detectable yet be early enough to not to interfere with any fall spawning salmonids. Each sampling site will be georeferenced and shown on maps. Stations will be selected that provide relatively diverse habitat structure and substrates to optimize the potential to collect suckers as well as other resident species.

As part of this effort, each reservoir will be bathymetrically mapped, using a boat-mounted fathometer coupled to a Real-Time Kinematic (RTK) or other similar georeferencing instrument. The boat will transect each reservoir at approximately 328-foot (100 meter) intervals at a slow enough rate of speed to record variations in substrate depth. The bathymetry will be scheduled to occur during a period of relatively high reservoir level and water and bed elevations will be benchmarked to Project datum. These data will then be imported into GIS to create a bathymetric map of each impoundment. Isodepths will be color coded on maps to ease interpretation, and identify potential over-wintering habitat.

At this time SCE anticipates that up to four electrofishing stations approximately 1600-feet-long would be fished longitudinally along the reservoir shoreline. The beginning and endpoint of each electrofishing station will be recorded with a handheld GPS unit. Water quality (temperature, dissolved oxygen, pH, and conductivity) will be measured *in situ* at three-feet in depth prior to each sampling run with a Yellow Spring Instruments (YSI) or equivalent electronic meter. The meter will be calibrated prior to each day's effort. In addition, a vertical temperature and dissolved oxygen profile will be obtained with a probe and meter (YSI or equivalent) deployed to a depth at least as deep as the hypolimnion boundary in offshore in water deeper than the epilimnion.

Electrofishing will be conducted at night. The start time and end time of each sample will be recorded. Stunned fish will be netted and immediately placed into an aerated live well filled with ambient water. At the end of each sample, all fish collected will be identified to species, enumerated, weighed and measured for length. If more than 50 individuals of a single species are collected, 50 fish will be randomly selected for measurements, and the remainder will be counted and batch-weighed. All fish will be released alive other than those saved as voucher specimens should that be necessary. Scale samples of brown trout and brook trout will be obtained and provided to CDFW for age analysis if desired.

This survey will also identify and enumerate aquatic amphibians following methods described in the Wildlife Study Plan, while executing this fish survey.

8. *Conduct Presence/absence survey of Longley Reservoir*

   Longley Reservoir is characteristically cold and oligotrophic and believed to have a naturally-reproducing brook trout population. CDFW has requested that SCE conduct a one-time qualitative fish sampling survey of Longley Reservoir. This reservoir's remote location and limited access limits the survey to hand-carried sampling gear. Based on discussions with the TWG, SCE anticipates deploying horizontal gill nets during a period of summer sampling to target obtaining a sample of up to 50 trout specimens. All fish will be identified to species; each fish will be measured, weighed and a scale sample obtained for purposes of aging. A minimum of two nets will be set for two 12-hour periods. Date, time, duration and prevailing weather conditions for each net set period will be recorded. Each net will be approximately 100-feet-long and comprised of two or three panels of varying mesh sizes (to be determined in consultation with CDFW). Depth and location for fishing the nets will be determined in the field based on professional judgement but will be based on habitat, bathymetry and deployment feasibility. Ambient water temperature and dissolved oxygen will be gathered at the beginning and conclusion of each net set.

9. *Evaluate select, localized water quality parameters that may affect the growth and distribution of fish species*

   a. The study will gather concurrent *in situ* water quality parameters during all sampling events. This will provide localized data describing water quality at stations where quantitative fish sampling occurs as discussed above under objectives 1 and 2 and will include temperature, dissolved oxygen, pH and conductivity. These data will supplement and compliment the water quality data gathered under the Water Quality Study Plan, which will gather data on the same parameters as well as others as described under that plan.

3.4.7 SCHEDULE, PERIODIC REPORTING, AND ONGOING CONSULTATION

The anticipated Study Plan development and implementation schedule is identified in Table 3-17. As described in the PAD and NOI, SCE anticipates seeking an expedited Study Plan determination process for some plans or for portions of some plans.

TABLE 3-17 ANTICIPATED POST PAD/NOI STUDY PLAN DEVELOPMENT MILESTONES AND FERC PROCESS THROUGH STUDY PLAN DETERMINATION

TASK	RESPONSIBLE ENTITY	SCHEDULE MILESTONES
File NOI/PAD with FERC along with Final Study Plans	SCE	May 1, 2019
FERC Holds Scoping and Site Visit	FERC	July 1, 2019-July 31, 2019
Deadline for Comments on PAD and Study Requests	Stakeholders	Aug 30, 2019
Preliminary Field Season[1]	SCE	2019
Fall TWG Workshop	SCE & TWG	Nov 2019
Request for waiver of 18 CFR 5.12 & 5.13	SCE	Sep 2, 2019
FERC Director's Study Plan Determination (assumes waiver granted)	FERC	Nov 8, 2019
First Field Season	SCE	2019
Initial Study Report (adjust as necessary in consultation with TWGs)	SCE	Nov 9, 2020
Second Field Season (as necessary)	SCE	2020
Final Study Report	SCE	Nov 9, 2021
License Application	SCE	June 2022

[1] Note: Because the 2019 field season precedes the Study Plan Determination is noted as "preliminary" because to avoid confusion with the FERC sequence of field season followed by Initial Study Report. For similar reasons, a fall TWG workshop is offered to review the results of the preliminary field season

This schedule is predicated on attaining agency agreement on the general goals, objectives and methods of the study, with the understanding that additional details may be resolved between the filing of the PAD and NOI, and the deadline for stakeholders to file comments on the PAD and make study requests. As well, there are additional decisions and ongoing consultation needs throughout the implementation of the study. For this Study Plan, the outstanding items for consultation are listed in Table 3-18. This table distinguishes between those items that need resolution before the study can be implemented, and those that would be the subject of ongoing consultation with the appropriate TWG.

TABLE 3-18 ANTICIPATED IMPLEMENTATION SEQUENCE

TASK	SCHEDULE FOR IMPLEMENTATION
Obtain collectors permits	Spring 2019
Bathymetric survey	June 2019
Sucker spawning survey	June 2019
Spring electrofishing	June 2019
Summer-fall electrofishing	September 2019
Data analysis	November 2019
Draft report	First quarter 2020

3.4.8 STUDY PLAN CONSULTATION RECORD

The Bishop Creek Reservoir Fish Distribution Study Plan was developed in consultation with the Bishop Creek Aquatic Resources 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 section summarizes the key consultation milestones for each Study Plan (Table 3-19), and how SCE addressed comments received through the consultation process. Table 3-20 is a Response to Comments Table for comments received from stakeholders, and how comments have been addressed in the final Study Plan. If a stakeholder's comments have not been incorporated, Table 3-20 will provide rationale based on Project specific information and FERC's Study Plan criteria (18 CFR § 5.9).

TABLE 3-19 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
Revised Study Plans	11/15/2018	TWG	12/4/2018 to 12/6/2018	1/7/2019
Proposed Study Plans (filed with PAD)	5/1/2019	TWG	6/12/2019 and 6/19/2019	7/12/2019

TABLE 3-20 SCE RESPONSES TO COMMENTS RECEIVED ON STUDY PLANS

COMMENT NO.	DATE OF COMMENT	ENTITY	COMMENT	SCE RESPONSE
1	8/31/2018	Tristan Leong, USFS	Propose objectives to document presence/absence of Owens sucker in Lake Sabrina and South Lake; measure recruitment and develop potential population estimate.	SCE proposes to characterize fish populations in the Project reservoirs, however the level of effort needed to develop population and recruitment estimates do not have a clear nexus. Sucker spawning, relative abundance, and size/age ranges of juveniles and adults will be documented but the overall population size will not be estimated.
2	8/14/2018	Nick Buckmaster, CDFW	Separate reservoir sampling study scope independently from Creek survey scope.	SCE concurs; see also fish baseline study scope for complementary creek study scope.
3	10/10/2018[8]	Nick Buckmaster, Steve Parmenter CDFW	Include bathymetric mapping of South Lake and Lake Sabrina to identify shoal and overwintering habitat potential.	SCE concurs and will add this to the study scope and study area.
4	10/10/2018	CDFW	Determine trout age classes from scale samples rather than inferring from length; identify aquatic amphibian species encountered during sampling.	SCE concurs and will add this to the study scope.
5	10/10/2018	CDFW	Sample two seasons (spring and early fall).	SCE concurs and will add this to the study scope.
6	10/10/2018	CDFW	Add Longley Reservoir, but limit to a single survey effort using gill nets.	SCE concurs and will add this to the study scope.
7	2/26/2019	Kary Schlick, USFS	PG 11 – earlier on or in the title include amphibian results.	
8	2/26/2019	Kary Schlick, USFS	PG 11 - I want to be on sight during electrofishing spring and fall & gill netting summer please incorporate this as part of the “Team” agency folk or TWG Member like identified in the BCIFNASP.	

[8] October 10, 2018 comments were received verbally at TWG meeting, Bishop, CA

3.4.9 REFERENCES

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3.5 BISHOP CREEK WATER QUALITY TECHNICAL STUDY PLAN (AQ 5)

3.5.1 PROJECT NEXUS AND RATIONALE FOR STUDY

During the TWG meetings, and in written comments, stakeholders identified the need to develop an understanding of water quality parameters in the Project area. This Study Plan is intended to inform the environmental analysis of the FERC and the SWRCB.

Although the Project is located in a relatively clean granitic watershed with limited factors to impact water quality, Stakeholders expressed a need to establish baseline conditions so that there may be a point of reference moving forward. Water storage and diversion activities could affect water quality in Project waters or contribute to water quality issues downstream.

The goals and objectives of this study are:

- Monitor water quality[9] for two years on a regular basis at multiple monitoring sites:
  - Above-Project-establish reference baseline conditions of inflow from natural runoff in watershed
  - In-Project-assess how/if water quality changes throughout various facilities within Project area (i.e., various depths and locations in South Lake and Lake Sabrina, powerhouse discharges)
  - Below-Project-assess any/all impacts Project operations may have on water quality that is leaving the Project area
- Monitor water temperature for two years on a regular basis at multiple monitoring sites
  - Above-Project-establish reference baseline conditions of inflow from natural runoff in watershed
  - In-Project-assess how/if water temperature changes throughout various facilities within Project area (various depths and locations in South Lake and Lake Sabrina, powerhouse discharges)
  - Below-Project-assess any/all impacts Project operations may have on water temperature that is leaving the Project area
- Ensure that future Project facilities and operations are:
  - Consistent with the water quality goals and objectives for Bishop Creek in the Water Quality Control Plan (Basin Plan) for the Lahontan Region (LRWQCB 1995)
  - Consistent with the desired conditions described in the 2018 Land Management Plan for the Inyo National Forest for Social and Economic Sustainability and Multiple Uses with the desired conditions described in Land Management Plan for the Inyo

[9] dissolved oxygen (DO), water temperature, turbidity, conductivity, TDS, orthophosphate, nitrate and total nitrogen

National Forest (USDA 2018) as they relate to ecological sustainability and diversity of plant and animal communities.

3.5.2 REVIEW OF EXISTING INFORMATION

The state of California has responsibility for maintaining water quality standards through the Federal Clean Water Act (CWA). The SWRCB and Lahontan Regional Water Quality Control Board (LRWQCB are responsible for the protection of beneficial uses of water resources within its jurisdiction and uses planning, permitting and enforcement authorities to meet this responsibility. Every water body within the jurisdiction of the LRWQCB is designated a set of beneficial uses that are protected by appropriate water quality objectives.

For smaller tributary streams in which beneficial uses are not specifically designated, they are designated with the same beneficial uses as the streams, lakes, or reservoirs to which they are a tributary. Table 3-21 lists the water bodies to which this Project drains and their beneficial use designations.

The Basin Plan defines the beneficial use abbreviations as the following:

- **Municipal and Domestic Supply (MUN) –** Uses of water for community, military, or individual water supply systems including, but not limited to, drinking water supply.
- **Agricultural Supply (AGR) –** Beneficial uses of waters used for farming, horticulture, or ranching, including, but not limited to, irrigation, stock watering, and support of vegetation for range grazing.
- **Industrial Process Supply (PRO)** – Uses of water for industrial activities that depend primarily on water quality.
- **Industrial Service Supply (IND) –** Uses of water for industrial activities that do not depend primarily on water quality including, but not limited to, mining, cooling water supply, geothermal energy production, hydraulic conveyance, gravel washing, fire protection, or oil well re-pressurization.
- **Ground Water Recharge (GWR)** - Beneficial uses of waters used for natural or artificial recharge of ground water for purposes of future extraction, maintenance of water quality, or halting of saltwater intrusion into freshwater aquifers.
- **Freshwater Replenishment (FRSH) -** Beneficial uses of waters used for natural or artificial maintenance of surface water quantity or quality (e.g., salinity).
- **Hydropower Generation (POW) –** Uses of water for hydroelectric power generation.

- **Water Contact Recreation (REC-1) –** Uses of water for recreational activities involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, swimming, wading, water-skiing, skin and scuba diving, surfing, whitewater activities, fishing, or use of natural hot springs.
- **Non-Contact Water Recreation (REC-2) –** Uses of water for recreational activities involving proximity to water, but not normally involving body contact with water where ingestion of water is reasonably possible. These uses include, but are not limited to, picnicking, sunbathing, hiking, beachcombing, camping, boating, tide pool and marine life study, hunting, sightseeing, and aesthetic enjoyment in conjunction with the above activities.
- **Commercial and Sportfishing (COMM) -** Beneficial uses of waters used for commercial or recreational collection of fish or other organisms including, but not limited to, uses involving organisms intended for human consumption.
- **Cold Freshwater Habitat (COLD) –** Uses of water that support cold water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates.
- **Wildlife Habitat (WILD)** – Uses of water that support terrestrial or wetland ecosystems including, but not limited to, preservation and enhancement of terrestrial habitats or wetlands, vegetation, wildlife (e.g., mammals, birds, reptiles, amphibians, invertebrates), or wildlife water and food sources.
- **Preservation of Biological Habitats of Special Significance (BIOL)** - Beneficial uses of waters that support designated areas or habitats, such as established refuges, parks, sanctuaries, ecological reserves, and Areas of Special Biological Significance (ASBS), where the preservation and enhancement of natural resources requires special protection.
- **Spawning, Reproduction, and/or Early Development (SPWN)** – Uses of water that support high quality aquatic habitats suitable for reproduction and early development of fish.

The LRWQCB has established water quality objectives for specific beneficial water uses in the Basin Plan for the Lahontan Region (LRWQCB 1995). The water quality objectives include both numeric and narrative standards for surface water that are based on criteria that protect both human health and aquatic life. If water quality is maintained at levels consistent with these objectives, beneficial uses are considered protected. Applicable water quality objectives and standards in the Basin Plan are provided in Table 3-22 and Table 3-23.

TABLE 3-21 WATER BODY BENEFICIAL USE DESIGNATIONS

SURFACE WATER BODY	Beneficial Use																					
	MUN	AGR	PRO	IND	GWR	FRSH	NAV	POW	REC1	REC-2	COMM	AQUA	WARM	COLD	SAL	WILD	BIOL	RARE	MIGR	SPWN	WQE	FLD
	Municipal and Domestic Supply	Agricultural Supply	Industrial Process Supply	Industrial Service	Groundwater Recharge	Freshwater Replenishment	Navigation	Hydropower Gen.	Water Contact Recreation	Non-Contact Water Recreation	Commercial and Sport Fishing	Aquaculture	Warm Freshwater Habitat	Cold Freshwater Habitat	Inland Saline Water Habitat	Wildlife Habitat	Special Biological Habitats	Rare, Threatened & Endangered Species	Migration of Aquatic Organisms	Spawning, Reproduction & Dev.	Water Quality Enhancement	Flood Peak Attenuation/Flood Water Storage
Upper Owens Hydrologic Area Hydrologic Unit 603.20																						
McGee Creek	X	X			X	X		X	X	X	X			X		X	X			X		
Bishop Creek (above intakes)	X	X						X	X	X	X			X		X				X		
Intake 2 Reservoir	X							X	X	X	X			X		X						
Bishop Creek (below intakes)	X							X	X	X	X			X		X				X		
Bishop Creek (below last Powerhouse)	X	X		X	X				X	X	X			X		X				X		

Source: LRWQCB 1995

TABLE 3-22 WATER QUALITY OBJECTIVES FOR HYDROLOGIC UNIT 603.20 UPPER OWENS RIVER HYDROLOGIC UNIT

CONSTITUENT/ PARAMETER	WATER QUALITY OBJECTIVE
Ammonia	Shall not exceed the values in Tables 3-1 to 3-4 in LRWQCB Basin Plan.
Bacteria	The fecal coliform concentration during any 30-day period shall not exceed a log mean of 20/100 milliliters (ml), nor shall more than 10 percent of all samples collected during any 30-day period exceed 40/100 ml.
Biostimulatory Substances	Waters shall not contain biostimulatory substances in concentrations that promote aquatic growths to the extent that such growths cause nuisance or adversely affect the water for beneficial uses.
Chemical Constituents	Waters designated as MUN shall not contain concentrations of chemical constituents exceeding the maximum contaminant level (MCL) or secondary maximum contaminant level (SMCL) based upon drinking water standards specified in Title 22.
Chlorine, total residual	For the protection of aquatic life, total chlorine residual shall not exceed either a median value of 0.002 milligrams per liter (mg/L) or a maximum value of 0.003 mg/L. Median values shall be based on daily measurements taken within any 6-month period.
Color	Water shall be free of discoloration that causes nuisance or adversely affects beneficial uses.
Dissolved Oxygen (DO)	The DO concentration, as percent saturation, shall not be depressed by more than 10 percent, nor shall the minimum DO concentration be less than 80 percent of saturation. For waters with the beneficial uses of COLD, COLD with SPWN, WARM, and WARM with SPWN, the minimum DO concentration shall not be less than that specified in Table 3-6 of the LRWQCB Basin Plan.
Floating Material	Water shall not contain floating material, including solids, liquids, foams, and scum, in concentrations that cause nuisance or adversely affect beneficial uses.
Oil & Grease	Waters shall not contain oils, greases, waxes, or other materials in concentrations that cause nuisance, result in a visible film or coating on the surface of the water or on objects in the water, that cause nuisance, or that otherwise adversely affect the water for beneficial uses.
pH	In fresh waters with designated beneficial uses of COLD or WARM, changes in normal ambient pH levels shall not exceed 0.5 pH units. For all other waters of the region, the pH shall not be depressed below 6.5 nor raised above 8.5.
Radioactivity	Radionuclides shall not be present in concentrations that are deleterious to human, plant, animal, or aquatic life or that result in the accumulation of radionuclides in the food web to an extent that presents a hazard to human, plant, animal or aquatic life.
Sediment	The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses.
Settleable Material	Waters shall not contain substances in concentrations that result in the deposition of material that causes nuisance or adversely affects beneficial uses.
Suspended Material	Waters shall not contain suspended material in concentrations that cause nuisance or adversely affect beneficial uses.
Tastes and Odors	Waters shall not contain taste or odor-producing substances in concentrations that impart undesirable tastes or odors to fish or other edible products of aquatic origin, that cause nuisance, or that adversely affect the water for beneficial uses.
Temperature	The natural receiving water temperature of intrastate waters shall not be altered unless it can be demonstrated to the satisfaction of the Regional Water Quality Control Board (RWQCB) that such alteration in temperature does not adversely affect beneficial uses.
Toxicity	All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal or aquatic life.
Turbidity	Waters shall be free of changes in turbidity that cause nuisance or adversely affect the water for beneficial uses. Increases in turbidity shall not exceed natural levels by more than 10 percent.

Source: LRWQCB 1995.

TABLE 3-23 WATER QUALITY OBJECTIVES FOR CERTAIN WATER BODIES IN UPPER OWENS RIVER HYDROLOGIC UNIT

SURFACE WATERS	OBJECTIVE (mg/L) [a,b]						
	TDS	Cl	F	B	NO_3-N	Total N	PO_4
Lake Sabrina	10 17	2.0 3.0	0.10 0.10	0.05 0.05	0.2 0.3	0.3 0.6	0.03 0.05
South Lake	12 20	3.7 4.3	0.10 0.10	0.02 0.02	0.1 0.1	0.1 0.4	0.03 0.04
Bishop Creek (Intake No. 2)	27 29	1.9 3.0	0.15 0.15	0.02 0.02	0.1 0.2	0.1 0.4	0.05 0.09

[a] Annual average value/90th percentile value.

[b] Objectives are in mg/L and are defined as follows:
B = Boron
Cl = Chloride
F = Fluoride
N = Nitrogen, Total
NO_3-N = Nitrate as Nitrogen
PO_4 = Orthophosphate, dissolved
TDS = Total Dissolved Solids (Total Filterable Residue)

Source: LRWQCB 1995

In 1974, ESE (1975) in cooperation with the University of California at Los Angeles conducted an environmental baseline study of the water quality of Bishop Creek. The report concluded that the water quality of Bishop Creek was excellent and displayed the following characteristics:

- TDS remained very low throughout the summer, less than 30 milligrams per liter (mg/l)
- Calcium (Ca) was the predominant cation in all sampled waters and surface water composition reflected the general geology of the drainage basin
- Nitrate and phosphate levels were low, generally less than 0.10 mg/1 and 0.05 mg/L, respectively
- Water temperatures generally increased downstream; the report further stated that Ca was the dominant cation and that North Fork had higher values than other drainages and appeared to be related to the geology (marble roof pendants) that is found in the upper reaches of North Fork. In addition, the report noted that as flow decreased in Bishop Creek increases in various ions were noted and was attributed to groundwater making up a larger percentage of the baseflow of the stream. The groundwater generally having more contact time with the underlying bedrock and accordingly higher concentrations of major ions (ESE 1975).

In 1986, the University of California at Riverside conducted a water quality investigation of Bishop Creek and selected eastern Sierra Nevada lakes for SCE (Lund, undated). The following discussion presents the results of that investigation.

3.5.2.1 BISHOP CREEK

The report determined that similar water characteristics that were reported from previous investigations with increasing dissolved constituents coincides with decreasing elevation. The dominant anion was bicarbonate and the dominant cations were calcium and sodium. In addition, the water quality of Bishop Creek at the furthest downstream site (below Powerhouse No. 6) had lower concentrations of alkalinity and dissolved constituents. The report stated that the likely reason for the decrease was the routing of water for power generation purposes. Table 3-25 presents a summary of the water quality characteristics for the various watersheds sampled.

In addition, minor amounts of boron, barium, aluminum, iron and manganese were found in the various drainages with the highest levels generally found in Bishop Creek below the confluence with South Fork.

3.5.2.2 SOUTH LAKE AND LAKE SABRINA

Like most Sierra reservoirs, South Lake and Lake Sabrina have very steep sides and considerable annual fluctuations in surface elevations which severely limit the production of littoral aquatic vegetation. There have been no comprehensive limnological studies of these lakes. Limited water quality profiling of the lakes was conducted from June 1986 until November 1987 and are presented in Table 3-26 and Table 3-27. Field measurements of water temperature, pH and dissolved oxygen was conducted at one location on each lake. In general, water temperature varied from lows of 32.3°F in March to 59.7°F in late August. In general, water temperature decreased with increasing depth. Dissolved oxygen ranged from 11.98 mg/L in early March to 2.44 mg/L in late August and was generally above 100 percent saturation except in August when dissolved oxygen values dropped to less than 38 percent saturation.

TABLE 3-24 BISHOP CREEK - PROJECT NO. 1394 PHYSICAL AND CHEMICAL CHARACTERISTICS OF NORTH AND MIDDLE FORKS OF BISHOP CREEK JUNE-NOVEMBER 1974

	SAMPLE LOCATION										
	S1	S2	S2A	S3	S4	S6	S6A	S7	S8	S19 Bishop Creek @ Hwy 395 (*)	
PARAMETER	RANGE	RANGE	RANGE	RANGE	RANGE	RANGE	RANGE	RANGE	RANGE	SPRING	FALL
Ca (mg/L)	1.7-3.7	2.3-4.9	1.9-2.9	1.9-3.2	2.2-2.6	2.3-3.0	2.3-3.3	2.1-2.7	2.1-3.0	9.6	8.8
Magnesium (mg/L)	0.1-0.16	0.13-0.18	0.12-0.16	0.14-0.22	0.17-0.19	0.18-0.22	0.18-0.23	0.13-0.22	0.13-0.16	0.7	0.5
Sodium (mg/L)	0.4-0.8	0.8-1.1	0.6-1.0	0.5-1.0	0.6-0.8	0.80.8-1.1	0.7-1.1	0.8-1.2	0.6-0.7	4.5	3.4
Nitrate as N (mg/L)	0.03-0.11	0.08-0.13	0.05-0.12	0.05-0.1	0.05-0.12	0.05-0.13	0.06-0.12	0.06-0.12	0.06-0.1	0.3	0.8
Phosphate as P (mg/L)	0.03-0.04	0.02-0.05	0.02-0.05	0.02-0.04	0.02-0.05	0.02-0.03	0.01-0.03	0.01-0.04	0.01-0.03	--	--
TDS (mg/L)	6-27	8-26	7-20	8-21	9-16	11-21	20	11-21	8-10	--	--
Water Temperature (deg °C)	10.0-11.5	8.5-11.0	10.0-13.5	9.0-13.5	10.0-14.0	10.0-15.0	12.5-14.5	11.0-15.0	9.9-15.0	12.5	8.5
pH (units)	5.5-7.5	5.0-7.1	5.0-8.8	5.0-7.4	5.0-6.8	5.0-8.2	5.5-7.2	5.0-8.4	5.0-7.3	7.5	7.29
DO (mg/L)	6.6-8.1	6.7-9.4	6.8-9.1	6.8-8.8	6.8-7.5	6.4-8.6	6.3-7.7	7.46.6-8.1	6.2-7.8	9.2	9.3

(*) Spring: May 1974; Fall: November 1974
(--) indicates analysis not performed.

Source: ESE 1975.

TABLE 3-25 BISHOP CREEK - PROJECT NO. 1394 PHYSICAL AND CHEMICAL CHARACTERISTICS OF MIDDLE AND SOUTH FORKS OF BISHOP CREEK, MCGEE CREEK AND BIRCH CREEK ([A, B]) MAY 1986 - DECEMBER 1987

	WATERSHED/SAMPLE LOCATIONS (c)					
	MIDDLE FORK OF BISHOP CREEK	SOUTH FORK OF BISHOP CREEK	BISHOP CREEK BELOW SOUTH FORK	MCGEE CREEK	NORTH FORK OF BIRCH CREEK	SOUTH FORK OF BIRCH CREEK
PARAMETER	1, 2, 3, 4	1S, 2S, 3S, 4S	5, 6, 7, 8, 9, 10, 17	11, 12	13, 14,	15, 16
Calcium (mg/L)	1.3-10.0	2.5-47.3	4.1-20	2.58-10.3	5.5-13.9	13.8-15.3
Magnesium (mg/L)	0.1-0.9	0.3-5.7	0.4-4.9	0.20-0.77	0.3-0.5	1.34-1.59
Sodium (mg/L)	0.3-2.7	0.7-4.8	1.2-16.7	1.00-2.77	1.8-2.5	1.93-2.85
Potassium (mg/L)	0.04-1.0	0.4-3.3	0.1-2.0	0.50-1.67	0.6-1.3	1.38-1.56
ANC (µeq/L) (d)	122-447	146-2,532	235-1,537	153-651	321-789	893-1,006
Chloride (mg/L)	0.1-0.5	0.2-1.0	0.2-5.6	0.12-0.28	0.2-0.3	0.23-0.25
Nitrate (mg/L)	ND(e)-1.1	ND-0.8	ND-1.2	0.55-0.59	ND-0.5	ND
Sulfate (mg/L)	0.1-13.3	1.3-23.2	1.7-13.0	1.16-2.76	2.9-3.5	1.78-2.25
Silica (mg/L)	1.5-9.1	2.52-13.9	5.65-22.7	NS (f)	9.65-11.4	16.63-19.58
Boron (mg/L)	ND-0.01	ND-0.02	ND-0.04	NS	ND	ND
Barium (mg/L)	ND	ND-0.019	ND-0.054	NS	ND-0.003	0.001-0.005
Aluminum (mg/L)	ND-0.07	ND-0.09	ND-0.60	NS	ND-0.16	ND-0.15
Iron (mg/L)	ND-0.83	ND-0.19	ND-0.74	NS	ND-0.002	0.02-0.04
Manganese (mg/L)	ND-0.042	ND-0.035	ND-0.028	NS	ND	ND-0.002

a - Derived from Lund undated.
b - Values presented are estimated. Original values were reported in µmoles/L (UCR 1988) and converted to mg/L.
c - ANC=Acid Neutralizing Capacity.
d - ND=Not detected (no detection limit provided).
e - NS=Not sampled.

Source: Lund, n.d.

TABLE 3-26 1986 FIELD WATER QUALITY DEPTH PROFILES FOR LAKE SABRINA

DATE	DEPTH (meters)	WATER TEMPERATURE (deg °C)	pH (units)	DISSOLVED OXYGEN	
				mg/L	% Saturation
06/24/86	0.5	12.61	7.25	8.31	108.3
	2.5	11.16	7.26	8.72	110.1
	4.5	9.33	7.33	9.07	110.0
	6.5	8.64	7.34	9.31	111.3
	8.5	8.01	7.43	9.46	111.5
	10.3	7.50	7.46	9.59	111.8
08/19/86	0.5	15.41	7.27	7.93	109.9
	2.5	15.25	7.23	7.72	106.6
	4.5	15.23	7.25	7.63	105.3
	6.5	14.91	7.45	8.11	111.1
	8.5	14.50	7.71	8.23	111.8
	10.3	14.03	8.06	8.44	113.5
	12.5	12.81	7.89	8.45	110.6
	14.5	10.82	7.65	8.43	105.7
	16.5	10.05	7.30	6.97	85.9
10/27/86	0.5	7.29	6.81	9.33	108.3
	2.5	7.29	7.01	8.96	104.0
	4.5	7.31	7.09	8.91	103.4
	6.5	7.30	7.13	8.85	102.7
	8.5	7.26	7.15	8.82	102.3

Source: Lund n.d.

TABLE 3-27 1987 FIELD WATER QUALITY DEPTH PROFILES FOR LAKE SABRINA

DATE	DEPTH (meters)	WATER TEMPERATURE (deg °C)	pH (units)	DISSOLVED OXYGEN	
				mg/L	% Saturation
03/18/87	0.5	0.14	7.14	11.98	114
	1.0	0.49	7.21	11.03	106
	2.0	1.66	7.26	10.45	105
	3.0	2.24	7.31	10.09	103
	4.0	2.80	7.35	9.70	100
	4.6	2.94	7.38	9.47	98
06/30/87	0.0	14.8	*	8.61	121
	0.5	14.5	*	8.70	122
	1.5	14.4	*	8.64	121
	2.5	14.4	*	8.62	120
	3.5	14.3	*	8.64	120
	4.5	14.3	*	8.64	120
	5.5	14.3	*	8.61	120
	6.5	14.2	*	8.74	122
	7.5	13.7	*	9.05	124
	8.5	13.1	*	9.26	126
	9.5	12.8	*	9.41	127
	10.5	12.1	*	9.64	128
	11.5	11.6	*	9.81	128
	12.5	10.5	*	10.41	133
08/24/87[1]	0.5	15.39	7.74	2.58	37
	2.5	15.42	7.69	2.44	35
	4.5	15.42	7.66	2.44	35
	6.5	15.41	7.66	2.44	35
	8.5	15.37	7.62	2.48	35
	10.5	14.91	7.62	2.55	36
	12.5	13.47	7.63	2.60	36
	14.5	12.25	7.78	2.71	36
	15.l	11.92	7.75	2.72	36
11/03/87	0.5	8.48	7.04	8.42	102
	2.5	8.50	7.23	8.25	100
	4.5	8.52	9.32	7.87	95
	6.5	8.51	7.55	8.34	101
	8.5	8.53	7.66	8.07	98
	10.5	8.42	7.40	7.82	95
	11.0	8.52	7.66	8.14	99

Source: Lund n.d.

[1] Low dissolved oxygen readings do not appear to correspond with any reported fish-kill and may be suspect. However, the Lund report shows similar data at other lakes in the Sierras in the same time-period, include Gem and Waugh Lakes.

Dissolved oxygen inversely followed water temperature and decreased values were observed as water temperatures increased. Values for pH ranged from 6.81 to 9.32; however, most values were between 7 and 8 pH units.

The chemical characteristics of the lakes are presented in Table 3-28. These measurements were taken in fall 1985. The chemical composition of these lake waters appears typical for reservoirs of this elevation and latitude in the Sierra Nevada. There are three basic factors which cause the high elevation reservoirs of this portion of the High Sierra to be mineral and nutrient-poor. First, the watersheds are generally undisturbed and support very little human habitation. Second, the substrates in these drainages are dominantly igneous intrusive rocks, and third, the drainages contain very shallow and poorly vegetated soils. The combination of these factors results in very little leaching of minerals and nutrients into waters entering the reservoirs.

TABLE 3-28 CHEMICAL CHARACTERISTICS FOR SOUTH LAKE AND LAKE SABRINA[A]

PARAMETER	SOUTH LAKE		LAKE SABRINA	
	SURFACE	BOTTOM	SURFACE	BOTTOM
Calcium (mg/L)	1.98	1.98	1.94	1.88
Magnesium (mg/L)	0.16	0.16	0.11	0.11
Sodium (mg/L)	0.34	0.34	0.18	0.28
Potassium (mg/L)	0.98	0.98	0.78	0.78
Nitrate as N (mg/L)	0.035	0.026	0.016	0.013
Sulfate as S (mg/L)	0.438	0.399	0.136	0.138
Bicarbonate	---	---	---	---

Notes:
a - Samples collected September 1985.

Source: Lund n.d.

Collection of water temperature data was not required as part of the 4(e) monitoring program for the existing license. However, beginning in 2004, the technology used for recording stream stage allowed for simultaneous collection of water temperature data. These data were not reported but are contained in Microsoft Excel data files that will be used to supplement data collected as part of this effort. Air temperature was recorded by a barologger kept in dry housing outside the stream. This barologger was used to calibrate the stream stage data (i.e. eliminate “noise” from pressure changes due to weather rather than changes in stream flow).

As part of the California's Surface Water Ambient Monitoring Program (SWAMP) for perennial streams, the California SWRCB undertook a water quality monitoring program on Bishop Creek from 2013 to 2016. The results of the study are summarized in Table 3-29.

The water quality was similar to that observed in previous studies with calcium and sodium the dominant cations. TDS was low ranging from 25 to 66 mg/L but averaged above the Basin Plan value of 27 mg/L for above Intake No. 2. Water temperature was generally less than 62.6°F. Two biological parameters that were detected were fecal coliform and *Escherichia coli* (E coli.) and ranged from 1 to 66 colony forming units (cfu) per100 ml and 1 cfu to 61 cfu per100 ml, respectively; exceeding the basin standard of 20 cfu/100 ml for fecal coliform.

Samples collected over the two-year period of 2015 and 2016 indicated non-detectable values for fecal coliform and E. coli for Bishop Creek (total of three samples) at the USFS boundary. Studies conducted by the RWQCB on Bishop Creek concluded that the impaired portion of Bishop Creek was located below Powerplant No. 6 and was likely the result of cattle grazing in or near Bishop Creek and potentially leaking sanitary sewer systems in lower Bishop Creek (Knapp and Craig 2016).

TABLE 3-29 SUMMARY OF SWAMP WATER QUALITY SAMPLING ON BISHOP CREEK AT NATIONAL FOREST BOUNDARY (STATION 603BSP111)

PARAMETER/CONSTITUENT (A)	UNITS	NO. OF SAMPLES	MAXIMUM	MINIMUM	MEAN	BASIN STANDARDS
Oxygen, dissolved	(mg/L)	1	10.7	10.7	'---	varies
Water Temperature	(deg °C)	12	16.4	2.2	9.84	NA
pH	(units)	12	**10.3**	7	7.97	6.5-8.5 (b)
Alkalinity (as $CaCO_3$)	(mg/L)	12	44	19	30.4	NA (c)
Turbidity	(NTU)	12	1.54	0.33	0.724	5 (d)
Specific Conductance	(µS/cm)	12	104.4	40.7	74.63	900-1,600 (d)
TDS	(mg/L)	12	**66**	25	**46.0**	27 (a)
Ca	(mg/L)	12	13.7	0.6	7.99	NA
Magnesium	(mg/L)	11	1.63	0.43	1.032	NA
Sodium	(mg/L)	11	4.82	1.1	3.085	NA
Potassium	(mg/L)	10	2.86	0.31	1.636	NA
Chloride	(mg/L)	12	1.6	0.36	0.884	1.9 (a)
Sulfate (as SO_4)	(mg/L)	12	9.55	3.15	6.157	250-500 (d)
Fluoride	(mg/L)	11	0.143	0.046	0.1014	0.15 (a)
Boron	(mg/L)	12	**0.481**	0.0058	0.1271	0.2 (a)
Nitrate and Nitrite (as N)	(mg/L)	11	0.0475	0.0065	0.01999	10 (e)
Nitrogen, Total	(mg/L)	12	**0.125**	0.049	0.0794	0.1 (a)
Phosphorus as P	(mg/L)	9	0.0094	0.0054	0.00752	NA
Orthophosphate as P	(mg/L)	12	0.0132	0.0051	0.00880	0.05 (a)
Fecal Coliform	cfu/100 ml(f)	27	**66**	**1**	**8.9**	20 (g)
E. coli	cfu/100 ml	24	**61**	**1**	**8.0**	100/320 (h)

Notes:
a – Basin Plan for Bishop Creek at Intake No. 2.
b – United States Environmental Protection Agency (USEPA) secondary standard for pH.
c – NA = Not Applicable – no current MCL.
d – CDWP secondary MCL.
e – California Drinking Water Program primary maximum contaminant level (MCL).
f – cfu – colony forming units
g – Lahontan Basin Plan
h – Basin Plan for Inland Surface Waters, Enclosed Bays, and Estuaries of California

Source: CEDEN 2018

3.5.3 STUDY AREA

Figure 3-10 presents the proposed study area for the Bishop Creek Water Quality Study.

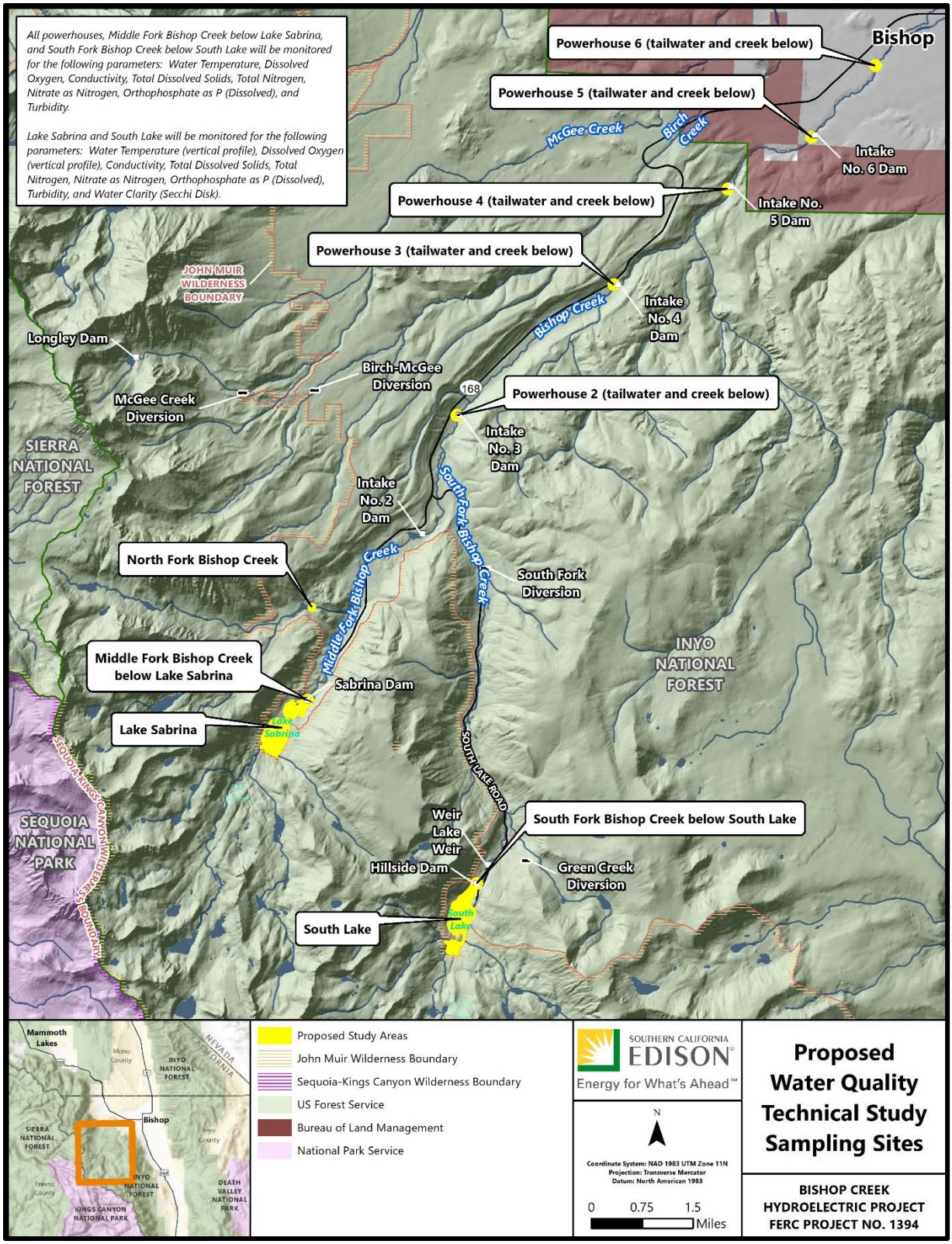

FIGURE 3-10 PROPOSED WATER QUALITY TECHNICAL STUDY SAMPLING SITES

3.5.4 METHODS

3.5.4.1 PARAMETERS TO BE MONITORED

- Water Temperature (in °C)
- TDS
- DO (in mg/l)
- Conductivity (in µmhos/cm)
- Total Nitrogen
- Nitrate (NO_3) as Nitrogen
- Orthophosphate (PO_4) as P (dissolved)
- Turbidity
- Water Clarity (Secchi Disk)
- Escherichia coli (E. coli)

3.5.4.2 VERTICAL PROFILES OF DISSOLVED OXYGEN AND WATER TEMPERATURE

Vertical profiles of dissolved oxygen and temperature will be collected at the deepest location(s) in South Lake and Lake Sabrina. The purpose of the survey is to identify the timing, extent and duration of any lake stratification. Vertical profiles of dissolved oxygen and temperature will be taken monthly beginning in June and ending in October. The following schedule is proposed for collecting the vertical profiles: June, July, August, September and October

The following sampling locations are proposed:

- Deepest point in Lake Sabrina (estimated at 78-feet-deep at full capacity)
- Deepest Point in South Lake (estimated at 130-feet-deep at full capacity)

When collecting dissolved oxygen and temperature profiles, the same sampling location will be visited each time so that the relative change in the profile (dissolved oxygen and temperature) can be determined throughout the summer. Dissolved oxygen and temperature readings will be taken every meter from the water surface to the lake bottom using equipment that is approved by USFS. In addition, the lake surface elevation would be recorded during each sampling date.

3.5.4.3 CREEK DISSOLVED OXYGEN AND TEMPERATURE SAMPLING

It is proposed that creek sampling will be conducted during the same periods as the lake sampling, monthly in June and October and bi-monthly from early July and terminating in late September. Dissolved Oxygen and temperature measurements would be sampled mid-depth in the middle, if accessible, otherwise adjacent to the bank of the stream. Temperature data will be recorded using a calibrated hand-held digital thermometer and dissolved oxygen concentrations will be sampled with equipment approved by USFS. The following sampling locations are proposed:

- North Fork Bishop Creek (background)
- Middle Fork Bishop Creek below Lake Sabrina
- South Fork Bishop Creek below South Lake
- Bishop Creek below Powerhouse No. 2
- Tailwater of Powerhouse No. 2
- Bishop Creek below Powerhouse No. 3
- Tailwater of Powerhouse No. 3
- Bishop Creek below Powerhouse No. 4
- Tailwater of Powerhouse No. 4
- Bishop Creek below Powerhouse No. 5
- Tailwater of Powerhouse No. 5
- Bishop Creek below Powerhouse No. 6
- Tailwater of Powerhouse No. 6

3.5.4.4 SAMPLING FOR SECCHI DISK, TURBIDITY, CONDUCTIVITY, TOTAL DISSOLVED SOLIDS, ORTHOPHOSPHATE, TOTAL NITROGEN AND NITRATE

3.5.4.4.1 SECCHI DISK READINGS

- Sampling Duration: Summer of 2020 and 2021
- Sampling Period: June, July, August, September and October
- Sampling Locations: within deepest portion of Lake Sabrina and South Lake at the same locations used for temperature and dissolved oxygen profiles
- Sampling Protocol: One sample per site using the Secchi disk to approximate depth of the euphotic zone/light penetration

3.5.4.4.2 TURBIDITY, CONDUCTIVITY, TOTAL DISSOLVED SOLIDS, ORTHOPHOSPHATE, TOTAL NITROGEN AND NITRATE

- Sampling Duration: Summers of 2020 and 2021
- Sampling Frequency: a minimum of 1 per month during June, July, August and late September
- Sampling Locations
  - Lakes
    - Within a deep hole of Lake Sabrina and South Lake
    - Sampling will be performed at two points: one above and one below the thermocline
  - Riverine Segment –
    - North Fork Bishop Creek (background)
    - Middle Fork Bishop Creek below Lake Sabrina
    - South Fork Bishop Creek below South Lake
    - Bishop Creek below Powerhouse No. 2
    - Bishop Creek below Powerhouse No. 3
    - Bishop Creek below Powerhouse No. 4
    - Bishop Creek below Powerhouse No. 5
    - Bishop Creek below Powerhouse No. 6

Sampling Protocol: USGS sampling protocol and procedures.

3.5.4.4.3 E. COLI [10]

- Sampling Duration: Summers of 2020 and 2021
- Sampling Frequency: six separate timeperiods starting July 1 and ending August 15
- Sampling Locations
  - South Lake and Lake Sabrina
    - Adjacent to the boat ramp
  - Intake #2 Forebay
    - Any easily accessible location adjacent to shore

[10] If any sample detects fecal coliform, quantitative polymerase chain reaction assay (qPCR) will be performed to assess the origin (human or animal) of the fecal coliform.

3.5.4.4.4 GENERAL

At each of the creek sampling events the following information would be recorded:

- Streamflow (in cfs)
- Air temperature
- Wind speed and direction
- Percent cloud cover
- Date, duration and amount of most recent precipitation event (if known or obtainable)

3.5.5 SCHEDULE, PERIODIC REPORTING, AND ONGOING CONSULTATION

A Water Quality Study Plan Report would include both a summary of the historic water quality as well as the water quality data collected during the summers of 2020 and 2021 (the need for a third year will be determined at the conclusion of the 2021 sampling season). A comparison with the water quality standards for the designated use classifications would be made. The summarized data would be analyzed to determine the level of impact, if any, associated with Project operations. Table 3-10 provides the proposed schedule for the Water Quality Technical Study.

TABLE 3-30 BISHOP CREEK WATER QUALITY STUDY PLAN SCHEDULE

TASK	RESPONSIBLE ENTITY	SCHEDULE MILESTONES
File NOI/PAD with FERC along with Final Study Plans	SCE	May 1, 2019
FERC Holds Scoping and Site Visit	FERC	July 1, 2019-July 31, 2019
Deadline for Comments on PAD and Study Requests	Stakeholders	Aug 30, 2019
Fall TWG Workshop	SCE & TWG	Nov 2019
Request for waiver of 18 CFR 5.12 & 5.13	SCE	Sep 2, 2019
FERC Director's Study Plan Determination (assumes waiver granted)	FERC	Nov 8, 2019
First Field Season	SCE	2019
Initial Study Report (adjust as necessary in consultation with TWGs)	SCE	Nov 9, 2020
Second Field Season (as necessary)	SCE	2020
Final Study Report	SCE	Nov 9, 2021
License Application	SCE	June 2022

3.5.6 STUDY PLAN CONSULTATION RECORD

This Study Plan was developed in consultation with the Bishop Creek Aquatic Resources 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 section summarizes the key consultation milestones for each Study Plan (Table 3-31), and how SCE addressed the comments received through the consultation process. Table 3-32 is a Response to Comments Table for comments received from stakeholders, and how comments were addressed in the final Study Plan. If stakeholder comments are not incorporated, Table 3-32 will provide rationale based on Project specific information and FERC's Study Plan Criteria (18 CFR § 5.9).

TABLE 3-31 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
Revised Study Plans	11/15/2018	TWG	12/4/2018 to 12/6/2018	1/7/2019
Proposed Study Plans (filed with PAD)	5/1/2019	TWG	6/12/2019 and 6/19/2019	7/12/2019

TABLE 3-32 SCE RESPONSES TO COMMENTS RECEIVED ON STUDY PLANS

COMMENT NO.	DATE OF COMMENT	ENTITY	COMMENT	SCE RESPONSE
1	8/31/2018	Tristan Leong, USFS	Recommend study to measure and evaluate water quality and temperature in Project reservoir and Project affected stream reaches.	A Water Quality Study Plan will be developed to address this request.
2	9/4/2018	Chase Hildeburn, SWRCB	Propose two studies to help establish baseline 1) water quality conditions and 2) water temperature conditions and inform relicensing entities how Bishop Creek Hydroelectric Project operations impact water quality and temperature.	SCE is combining the water quality and water temperature studies into a single Study Plan, which will also be coordinated and consistent with other aquatic studies being discussed.
3	9/4/2018	Chase Hildeburn, SWRCB	Proposed objectives and Project nexus language for suggested Water Quality Technical Studies.	SCE's draft Water Quality Technical Study incorporates the proposed language.
4	10/10/2018	TWG Meeting	There is an interest in sampling for fecal coliform and E. coli throughout system to assess if Project facilities may contribute to degraded conditions observed below the Project.	As described in this plan, recent studies including California's SWAMP and by the Regional Water Control Board on Bishop Creek concluded that the impaired portion of Bishop Creek was located below Powerplant No. 6 and was likely the result of cattle grazing in or near Bishop Creek and potentially leaking sanitary sewer systems in lower Bishop Creek. (Knapp and Craig 2016). SCE has not been convinced that a suitable nexus exists between the observed impaired conditions below Powerplant No. 6 and the Project's facilities/operations to warrant adding this expensive study.
5	2/26/2019	Kary Schlick, USFS	pg1 – On the table, who determined where spawning occurs?	

COMMENT NO.	DATE OF COMMENT	ENTITY	COMMENT	SCE RESPONSE
6	6/19/2019	TWG Meeting	Determine if methyl mercury has concentrated in Project reservoirs from historic mining activities	SCE does not believe surveying for methyl mercury is warranted. A literature review of previous investigations in this area and SCE's rational for not including was distributed to the TWG on 7/25/2019 (See Appendix A) SCE is willing to review and consider additional information, if presented that suggests methyl mercury contamination is a potential Project effect and make adjustments to sampling as appropriate in consultation with the aquatics TWG.
7	6/19/2019	Technical Work Group Meeting	Conduct fecal coliform sampling and analysis at recreational lakes: South Lake, Lake Sabrina, and Intake #2 forebay	Fecal coliform has been added to the water quality Study Plan [note that per subsequent discussions, the test for bacterial was changed to E. coli to be consistent with Regional Water Board standards].
8	7/3/2019	Chase Hildeburn, SWRCB	Conduct fecal coliform sampling and analysis at recreational lakes: South Lake, Lake Sabrina, and Intake #2 forebay	Fecal coliform has been added to the water quality Study Plan [note that per subsequent discussions, the test for bacterial was changed to E. coli to be consistent with Regional Water Board standards].
9	7/31/2019	FERC Scoping Meeting (Susan Monheit, SWRCB)	Consider adding Benthic Macroinvertebrate Index (BMI) as indicator of aquatic health.	SCE suggests that existing information including ongoing riparian monitoring conducted as part of the existing license, coupled with studies as proposed are sufficient for assessing aquatic health. By email dated 8/7/2019 SWRCB agrees that BMI was not necessary and that due to the nutrient poor watershed

COMMENT NO.	DATE OF COMMENT	ENTITY	COMMENT	SCE RESPONSE
				and limited development, we do not anticipate any significant impacts on inverts from the Project" (Appendix A)
10	8/5-7/2019	Chase Hildeburn, SWRCB	Substitute E. coli for fecal coliform to follow statewide plan for inland waters	E. coli has been substituted for Fecal coliform in the proposed study.

3.5.7 REFERENCES

California Environmental Data Exchange Network (CEDEN). 2018. http://www.ceden.org/. Accessed May 2018.

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3.6 SEDIMENT AND GEOMORPHOLOGY STUDY PLAN (AQ 6)

3.6.1 PROJECT NEXUS AND RATIONALE FOR STUDY

During the TWG meetings, stakeholders identified the need to understand the sediment dynamics in Bishop Creek, including understanding what flows mobilize sediment and what Project operations could be modified to mobilize sediments and large woody material (LWM) from forebays above the diversion dams into reaches that have a low sediment supply. This study focuses on the reaches between Plant No. 2 and Plant No. 6, will provide additional information pertaining to riparian and fisheries habitat assessments, and has the potential to reduce maintenance needs of the Project by limiting the accumulation of LWM and sediment in the forebays.

Continued Project O&M and other activities including PME measures implemented during a new license will require an understanding of the existing relationship between sediment transport, flow in Bishop Creek, and Project operations. Proposed studies will evaluate the potential impacts of sediment on the Project's continued operations and evaluate potential O&M savings by maintaining sediment transport along the study reach. A synthesis of existing data and additional data collection will improve SCE's understanding of the sediment and LWM dynamics at this Project.

3.6.2 STUDY GOALS AND OBJECTIVES

This study seeks to develop an understanding of sediment dynamics in Bishop Creek by analyzing relationships between sediment and flow dynamics in Bishop Creek to assist SCE and stakeholders in understanding how Project operations interact with sediment transport in Bishop Creek. To meet this goal, this Study Plan has the following objectives:

- Determine flow conditions in which sediment is mobilized in the stream channel
- Understanding if and how LWM is mobilized
- Evaluate flows that could mobilize sediments and LWM from forebays
- Evaluate how operations (flow release timing, magnitude, and duration) could be modified to provide sediment transport flows
- Understand potential sediment inputs and impacts from higher flows to reaches below Plant 6 from proposed changes in flow/operations

3.6.3 REVIEW OF EXISTING INFORMATION

The analysis for this study will rely on existing data gathered as part of the existing Project license, as well as additional data gathered to support the understanding of flow and sediment dynamics in the study reach. Therefore, this section reviews sources of existing data and discusses limitations on stream flow management at the Project.

3.6.3.1 GEOMORPHOLOGICAL DATA

As part of the study investigating stream geomorphology and riparian vegetation, the SLA Report (Simons 1990) evaluated stream channel processes in the Project area. This report included a review of Project geomorphology, hydrology, hydraulics and incipient motion of particles at six locations from the confluence of the South Fork and the Middle Fork of Bishop Creek down to Plant 6. The reader is referenced to SLA Report (Simons 1990) for a summary of geology and hydrology near the Project; this report covered the following:

- Overview of site geology
- Baseline geomorphic survey from 1989 field work
- Eight cross-sections and a longitudinal profile at each of six monitoring sites
- Bed particle size, bar particle size, and incipient motion analyses
- Pre-instream flow hydrology summary

Following completion of the SLA Report, riparian vegetation monitoring (Psomas 2005, Read and Sada 2013, Read 2015) and aquatic habitat monitoring (Psomas 2005, Read and Sada 2013) has occurred approximately every five years at the Project. These reports provide good historical data spanning an approximate 30-year period that can be used to inform this study, including the following information.

Riparian Monitoring

- Baseline (1991 to 1993) and repeat surveys (field surveys in 2004, 2009 and 2014)
- Re-surveyed cross-sections that can be used to indicate channel stability
- Riparian tree sizing, age, and mortality
- Presence of LWM in the riparian zone
- Geomorphic parameter summary by site

Aquatic Habitat Monitoring

- Baseline (1991 to 1993) and repeat surveys (field surveys in 2005 and 2009)
- Characterization of channel width, depth, and velocity during three seasons in a monitoring year
- Substrate size distributions for each study reach
- Substrate embeddedness

If the SLA Report sites and cross-sections can be recovered (believed to be likely for at least sites 3, 4, and 5), they will serve as the basis for the study reaches in this report (Section 5). The subsequent riparian vegetation and aquatic habitat monitoring surveys generally aligned with the initial geomorphic study sites, but over time, some sites were abandoned due to vandalism and site disturbance. While the post-1993 (after the start of minimum instream flows) study sites may not align directly with the proposed study reaches for this Study Plan, the information will be useful for calibrating a hydraulic model and understanding channel geomorphology.

Subsequent to the SLA Report, Sada and Hawkins (1997) performed an evaluation of the impacts of released impoundment sediment (fines, sands and gravel) on sediment depth in pools, substrate type in pools, and pool bottom elevations. This report evaluated conditions immediately downstream of Intake 3 and Intake 4 twice prior to sediment release, immediately after sediment release, and after a 200 cfs, 24-hour flushing flow for these areas. Sada and Hawkins (1997) found that the released sediment, while equally deposited in riffles and pools (filling some to depths of more than 50 centimeters [cm] immediately after the release), generally was transported down to the next intake impoundment by the flushing flow. The substrate in the pools was not found to be substantially different when comparing the pre-sediment release and post-flushing flow conditions in any of the pools below Intake 3 and in 12 of 15 pools below

Intake 4. The study determined there were no differences in pool substrate coverage by sediment in either reach when comparing pre-sediment release and post-flushing flow conditions, despite transport of the sediment 1300 meters and 2500 meters downstream of Intakes 3 and 4, respectively. The substrate in the pools was generally smaller than 1.5 inches (gravel) and larger than medium sand (0.3 mm, 0.012 inch). Additional information contained in this report includes:

- Turbidity monitoring during background conditions, the sediment release, and flushing flows
- Pool characteristics and substrate elevations for 15 pools in each reach
- Sediment depth, coverage, and composition for each study reach
- Summary of fish rescue and mortality during the study

To manage sediment in the impoundments, SCE has periodically removed sediment from the intake impoundments to maintain storage capacity and minimize the potential for sediment to be sucked through the powerhouses. The largest removal effort in the past 40 years occurred in response to historic flooding from Tropical Storm Olivia in 1982 that resulted in the failure of the North Lake Reservoir dam (peak flows estimated at 1500 cfs to 2000 cfs in Bishop Creek). Shortly after this flood, sediment was removed from Intakes 3, 4, 5 and 6 to restore storage capacity. Sediment was removed from Intake 2 in the late 1980s or early 1990s; it had adequate capacity up until that time. This sediment removal effort at Intake 2 resulted in the excavation of approximately 50,000 cubic yards (CY) of sediment from the impoundment that were primarily generated from the dam failure. Since these removal efforts, periodic drawdowns of the intake impoundments have occurred (primarily for maintenance of necessary structures), but there is no regular sediment removal, sediment sluicing, or drawdown program. More recently, in 2009, 2010, and 2011, SCE removed sediment from Intakes 6, 4 and 5, generating approximately 1200 CY, 1500 CY and 2000 CY of material, respectively. According to the Project staff, there is minimal LWM that drops from the sediment of the impoundments, based on the recently excavated sediment. Project staff indicated that while some LWM may sink, most washes over the spillway and there are no issues with large LWM flows clogging the intake structures. Staff did mention that there can be a larger LWM and sediment load if 1) there is a higher runoff year

after a few years of lower flows, 2) when the upstream beaver dams are blown out and release some of their accumulated sediment.

Just downstream of the outlet from Plant 6 on the Project, the LADWP operates a small diversion structure to supply the Main Indian Ditch Diversion with water. This impoundment is 3-feet to 5-feet-deep and has sediment removed more frequently than the Project impoundments (Charles Partridge, SCE Project Staff, *personal communication*).

3.6.3.2 PROJECT HYDROLOGY AND FLOW MANAGEMENT

The Project's relatively extensive Bishop Creek daily stream discharge (i.e., flow) dataset will be utilized to evaluate channel geomorphology and sediment transport in this reach. The Operations Model Study Plan (proposed as part of this relicensing effort) will be used in this study to provide ranges for flow releases that could be proposed to mobilize sediment throughout the Project. In addition, annual hydrographs and peak annual flows for the study reaches, developed by SCE, will be used to evaluate sediment transport in the study reach.

As described in the Operations Model Study Plan, flow at the site varies, depending on the amount of runoff and SCE's release schedule, which is dictated by snowpack, snow melt, spring rain events, drought, power demand, and irrigation. In Bishop Creek above Plant 6 (USGS Gage 10271200), calculated daily mean flows (water years 1994 to 2017) range from 0.1 cfs to 420 cfs, with peak runoff generally occurring from June to August, as the snow melts in the higher mountain elevations. Over the last 24 years, annual peak daily runoff values ranged from 15 cfs to 453 cfs in Bishop Creek (Table 3-33). These peak flows may be the channel-forming flow in Bishop Creek and thereby an important flow to evaluate as part of this study.

Bishop Creek Hydroelectric Project utilizes water from Bishop Creek to generate electricity, but there are minimum pass-by flows between the diversion dams. These pass-by flows and downstream minimum flows are documented in Section 4.3. Other sources of water input between the junction of the South Fork and Middle Fork down to Plant 6 include three tributaries, of which the largest is Coyote Creek, which enters Bishop Creek upstream of Plant 4. SCE has stream gages installed at many locations in the watershed (Figure 3-11) most of which have more than 20 years of data available. These gages will be utilized where necessary to

evaluate flow conditions in the study reaches, including peak annual flows, average flows, and estimations of bankfull based on flow-event return period.

TABLE 3-33 ANNUAL PEAK STREAM FLOWS IN BISHOP CREEK ABOVE PLANT 6 SINCE THE OCCURRENCE OF BYPASS FLOWS

WATER YEAR	DATE	STREAM-FLOW (CFS)
1994	September 29, 1994	71
1995	July 31, 1995	421
1996	July 29, 1996	197
1997	January 3, 1997	250
1998	July 23, 1998	453
1999	November 4, 1998	189
2000	November 4, 1999	163
2001	July 8, 2001	367
2002	November 6, 2001	194
2003	October 1, 2002	86
2004	June 8, 2004	180
2005	July 19, 2005	283
2006	July 24, 2006	310
2007	June 20, 2007	83
2008	May 22, 2008	138
2009	July 03, 2009	77
2010	July 17, 2010	362
2011	April 8, 2011	236
2012	August 16, 2012	41
2013	July 24, 2013	113
2014	March 19, 2014	15
2015	November 20, 2014	55
2016	June 30, 2016	116
2017	July 15, 2017	421
24-year Annual Peak Stream Flow Average:		**201**

Source: USGS 2018

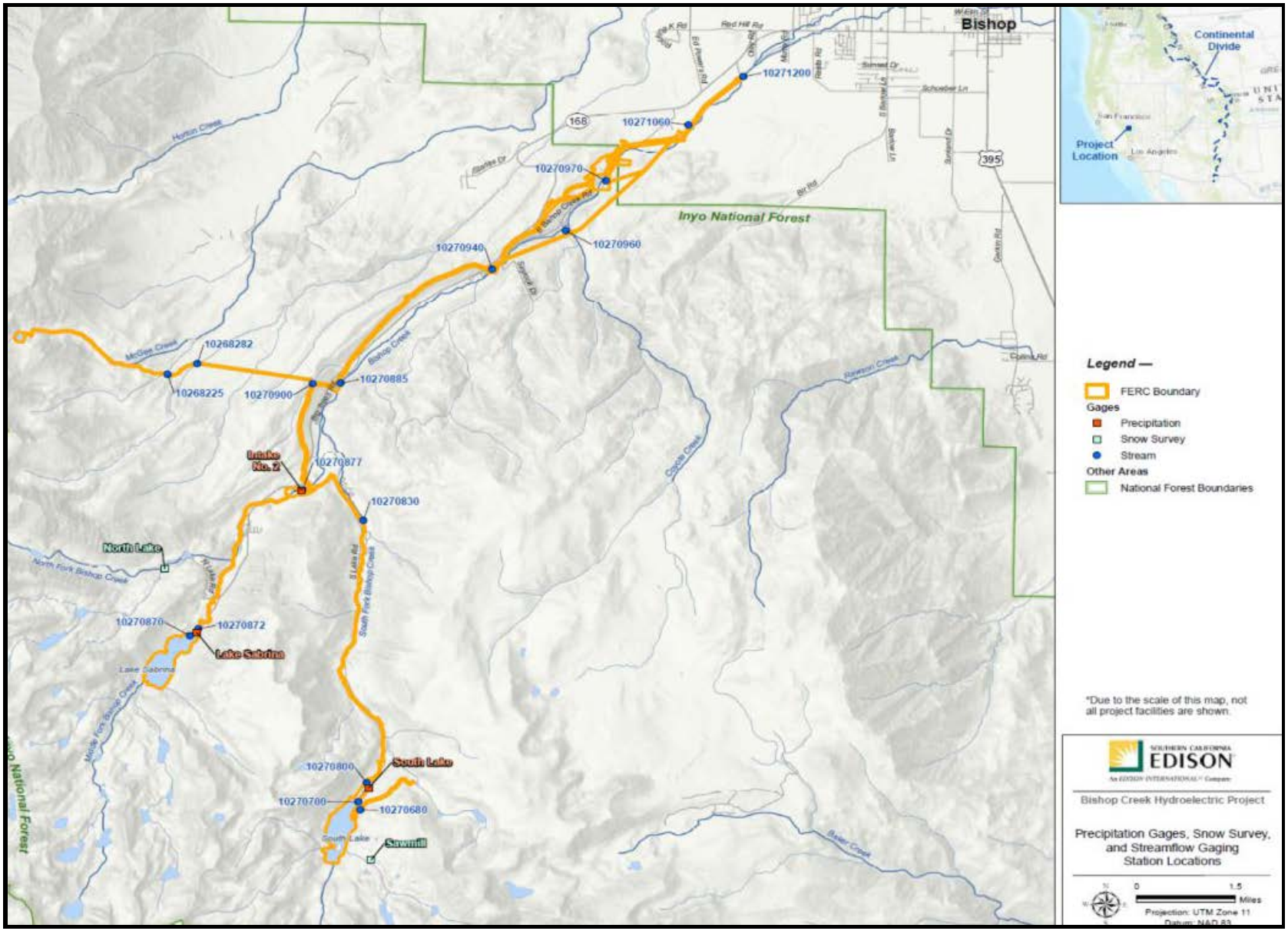


FIGURE 3-11 STREAM FLOW GAGING STATIONS ALONG BISHOP CREEK

3.6.3.3 REGULATORY AND LEGAL CONSTRAINTS

Project operations are subject to adjudicated water rights and other agreements that provide for non-power uses. The Chandler Decree is one of the primary controlling documents. The Sales Agreement between Southern Sierra Power Company and the LADWP addresses SCE's obligations with respect to the waters of Bishop Creek. Within these constraints, SCE manages the releases from the storage reservoirs, for purposes of hydro-generation and meeting water allocation requirements.

The Sales Agreement provides for seasonal maximum carry-over limits of 2147 acre-feet, as measured on or about April 1, annually. Variances from this requirement have been obtained on a case-by-case basis in the past, by mutual-agreement between SCE and LADWP. Additionally, SCE meets with the USFS annually to determine: 1) seasonal minimum storage requirements for recreation purposes; and 2) annual flushing flows.

The Chandler Decree and SWRCB water rights licenses determine how flows are allocated and used, as follows:

- Seasonal diversion and accumulation limit not to exceed historically measured use (i.e., not to exceed current Project capacity), including an annual limit of 1400-acre feet from Green Creek.
- Instantaneous diversion limit at all locations not to exceed historically measured use (i.e., not to exceed current Project capacity), including a daily average limit of one cfs for domestic use.
- Minimum Project flow-through (downstream delivery) requirements, for senior downstream water rights holders, are measured below Plant 6, as required by the Chandler Decree (Table 3-7).
- Minimum instream flow requirement of 0.25 cfs at the Birch Creek diversion, for senior downstream water rights holders, as stipulated by the Chandler Decree.
- Minimum instream flow requirement of 1.6 cfs during the irrigation season, and 0.4 cfs at other times, through the Abelour Ditch, for senior downstream water rights holders in the Rocking K Subdivision.

TABLE 3-34 DAILY AVERAGE FLOW REQUIREMENTS FOR FLOW BELOW PLANT 6

TIME PERIOD	DAILY AVERAGE FLOW (CFS)	INSTANTANEOUS MINIMUM FLOW (CFS)
April 1-15	44	33
April 16-30	68	51
May 1-15	87	65
May 16-31	98	74
June 1 - Jul 31	106	90
August 1-31	106	80
September 1-15	76	57
September 16-30	58	44

Source: Chandler Decree 1929

In addition, there are required minimum instream flow requirements within the Project that are mandated by the Article 105 of the FERC license, as follows:

- **Lake Sabrina to Intake 2**: no less than 13 cfs or natural flows, whichever is less, year-round
- **South Lake to South Fork Diversion**: no less than 13 cfs or natural flows, whichever is less, year- round
- **Intake 2 to Plant 2**: no less than ten cfs from Friday of the last weekend in April thru October 31; no less than seven cfs for the remainder of the year; or no less than five cfs in all months in dry years
- **Southfork Diversion:** no less than ten cfs from Friday of the last weekend in April thru October 31; no less than seven cfs for the remainder of the year
- **Plant 2 to Plant 3**: no less than 13 cfs year-round
- **Plant 3 to Plant 4**: no less than five cfs year-round
- **Plant 4 to Plant 5**: no less than 18 cfs year-round (Article 105)[11]
- **Release from Plant 6:** Per Chandler Decree (Table 3-34)

3.6.4 STUDY AREA

Figure 3-12 presents the proposed study area for the Bishop Creek S&G Study Plan. The study area would focus on the areas of Bishop Creek that could potentially be modified by changes in

[11] Article 114 required 18 cfs (or the natural streamflow, whichever is less), however this license condition was removed by order dated February 1, 1995 because of a conflict with the Energy Policy Act of 1992, which changed how the FLPMA treated lands which had been previously subject to a reservation under Section 24 of the Federal Power Act. The remaining language in Article 105 ambiguous as to whether the minimum flow requirement is 12 cfs or some greater amount negotiated with the CDFW. Historically SCE has been releasing 18 cfs.

Project operation; Lake Sabrina, South Lake, and sections of Bishop Creek down to the Intake for Plant 3 are not included in this study. The study area focuses on the seven proposed S&G monitoring sites identified in Figure 3-12. This includes six S&G monitoring sites (S&G monitoring sites 2 through 6, including a split site at Site 4.1 and Site 4.2) that align with the monitoring sites established by Simons, Li, & Associates (1990), as well as one new monitoring site (S&G monitoring site 7) to characterize channel substrates and dimensions downstream of the junction with Coyote Creek.

S&G monitoring sites 2 through 6 were selected because of their inclusion in earlier stream monitoring studies (Read, 2015; Simons 1990). These sites are located at the lower end of each reach between powerhouses, which should be in more equilibrium with the stream channel relative to any site just downstream of the diversion dam where there would likely be less sediment. S&G monitoring site 1 referenced in the SLA Report is omitted from the proposed study area because it had a high frequency of disturbance (due to the nearby campground), as noted in previous studies in this area, making it unlikely to recover the same site. S&G monitoring site 7 is a new site established for this study. It should be noted that the numbers assigned to the Bishop Creek sites correspond not to their relative location along the stream but rather to the chronological order in which the sites were established prior to 1991. In order from upstream to downstream on Bishop Creek, the S&G monitoring sites are numbered, Sites 4.2, 4.1, 2, 7, 3, 5, and 6. Of these, Sites 2 and 3 were originally selected because they correspond to two of the major physiographic valley types present along Bishop Creek; Sites 4 through 6 were selected because they were considered to be sensitive to changes in streamflow or to have vegetation (or wildlife) of special interest (Read 2015 and Sada 2009). In 1991, Site 4 was divided into two monitoring sites due to the change in slope and channel characteristics in this stream section; this aligns with the riparian vegetation monitoring sites. This numbering scheme will be retained to maintain continuity between monitoring activities.

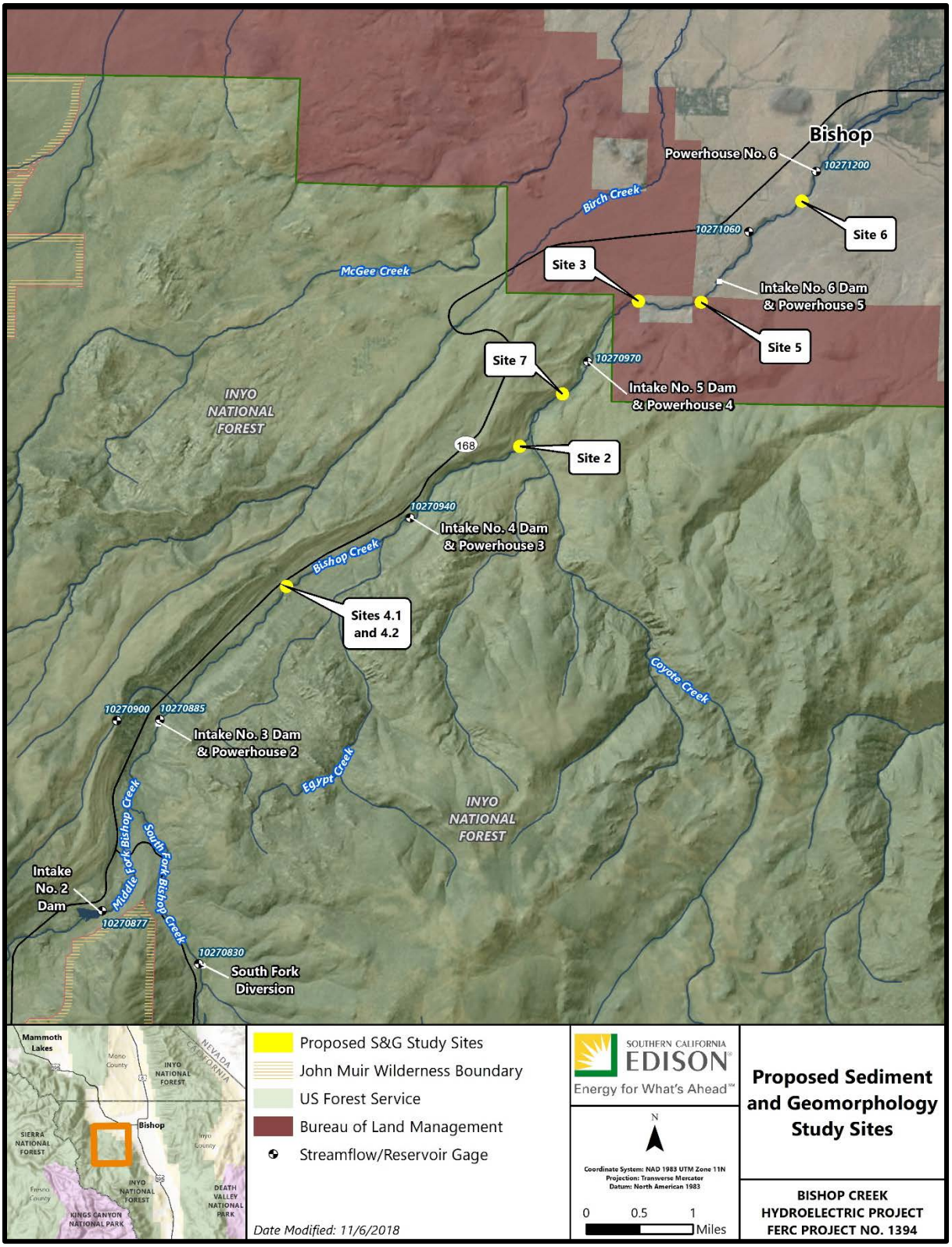


FIGURE 3-12 PROPOSED SEDIMENT AND GEOMORPHOLOGY STUDY SITES

3.6.5 METHODS

The Bishop Creek Sediment and Geomorphology Study will include five primary, intertwined tasks: 1) field surveys, 2) an assessment of LWM, 3) an estimate of annual sediment loading, 4) an evaluation of substrate mobility, and 5) an evaluation of flushing flows on sediment mobility and LWM dynamics. These tasks will serve to clarify the objectives of this Study Plan by increasing SCE's understanding of sediment and LWM dynamics in Bishop Creek.

The general sequence of steps to complete these tasks are as follows, with additional detail provided below:

1. Perform preliminary field reconnaissance to confirm SLA Report sites (S&G monitoring sites 2 through 6) and cross-sections can be recovered, while also selecting a location for S&G monitoring site 7. Confirm "typical" sediment size by sampling bulk piles of sediment previously excavated from impoundments throughout the Project (to be used to select sieve size for sediment sampling).
2. Compile and review data from the in-stream flow period (1994 to 2018) on peak annual flows and flow duration curves for the gage nearest each site.
3. Perform cross-section survey, substrate characterization, bankfull flow evaluation, and LWM assessment at each S&G monitoring site.
4. Perform bedload sediment transport measurements during estimated bankfull flows at the most upstream (S&G monitoring site 4.2) and most downstream (S&G monitoring site 6) sites.
5. Utilize FlowSed[12] to estimate annual sediment loads at S&G monitoring site 4.2 and S&G monitoring site 6.
6. Evaluate potential bed substrate mobility under bankfull, and flood flows, including impacts of possible flushing flows.
7. Comment on the potential benefits, disadvantages, and outcomes of using flushing flows to mobilize sediment and LWM through the Project.
8. Develop a summary report that outlines the methods, field work, conclusions, and recommendations as it pertains to sediment and LWM in the Bishop Creek study reach.

3.6.5.1 TASK 1: FIELD SURVEYS

The first part of Task 1 (Task 1A) will be a field reconnaissance visit to recover the eight cross-sections at each of the S&G monitoring sites 2 through 6 (from the SLA Report Sites 2-6) and evaluate nearby locations at each for sediment sampling. The prior cross-sections were marked in

[12] FlowSed is a sediment transport model.

the field in 1989 with rebar and aluminum tags marked S1 through S8 from downstream to upstream at the sites and based on prior work in these areas. Some of the sites may be recoverable after approximately 30 years. For this study, field staff will survey one cross-section in each of three separate riffles (in the upstream two-thirds of the riffle) at each site as part of a later field effort. Sediment mobility is calculated in riffles; therefore, any cross-sections in a pool, run or glide will not adequately represent the sediment transport capacity of the reach. If the SLA Report cross-sections are not in suitable locations, new cross-sections will be selected, as the sediment transport modeling requires cross-sections to be in the active portion of the riffle. During the field reconnaissance visit, the location of Site 7 will be evaluated and modified, if needed, based on field conditions. After this visit, the sites will each have three cross-sections identified in a riffle reach suitable for evaluation of sediment transport with additional survey and data collection.

Because several of the sites align with the riparian vegetation monitoring cross-sections (to be surveyed in 2019), that cross-section data will be utilized rather than re-surveying the cross-sections. Prior to the field survey, field staff will review stream flows that occurred following the riparian vegetation monitoring survey to ensure that there were no peak flows substantially larger than normal peak flows. This initial visit will include a modified Pfankuch Channel Stability Rating (Rosgen 2014) to evaluate the condition of the channel and inform sediment transport calculations.

To inform sediment sampler size selection and support the evaluation of sediment transport, a sieve analysis of previously excavated sediment will be performed during this initial site visit. Field staff will talk with plant operators to understand the frequency of sediment removal, frequency of drawdowns, feasibility of flushing deposited sediment, and LWM mobilization at each of these impoundments. If reasonably feasible, the particle size of sediments previously excavated from the impoundments will be determined by sieve analysis in the field for three composite samples at identified piles of excavated sediment, anticipated to include samples from removed sediment from Intakes 2, 4, 6, and the LADWP impoundment directly downstream of Plant 6, assuming no mixing of excavated soils with other sources of soil or rock. The composite samples will include a sample from approximately 6-inches to 18-inches-below the existing

surface at three well-spaced locations to minimize any sorting of particles by erosion processes on the surface of the excavated sediment.

The second part of Task 1 (Task 1B) will be to collect additional field data, including cross-section and longitudinal surveys, bed substrate characterization, bankfull bed sediment transport measurements needed to support subsequent analytical tasks. This fieldwork will occur when flows are lower and more stable (likely in the fall of 2020).

For each of the 18 cross-sections in the SLA Report, the survey will utilize the same local datum as the SLA Report to the extent possible. Three new cross-sections will be established at S&G monitoring site 7. Each cross-section will use the same cross-section endpoints (rebar), if they can be recovered, otherwise new rebar monuments will be established well outside the bankfull channel. Each monument (recovered and new) will be recorded with a sub-meter GPS. The survey will capture major breaks in topography along the cross-section, the bankfull elevation (if a defined feature can be identified), and the water level; generally based on the USFS protocol (Harrelson et al. 1994). Photos of each cross-section will be taken facing upstream, downstream, left, and right to document the conditions at the time of the survey. Additionally, representative photos of the bed substrate as well as a photo of any active bars in the site reach will be captured. To inform bed substrate mobility, a Wolman pebble count[13] (minimum 100 samples) will be performed within the active riffles at each site, as well as a bar sediment sample (grab sample to determine D_{84}), if any bars are present in the site reach. This generally aligns with the methods and approach utilized in the SLA Report, which will allow for comparisons with the prior study. To characterize the slopes at each site, a longitudinal profile will be established through the S&G monitoring site cross-sections with a length of approximately 20 times the bankfull width or through three riffle-pool sequences, whichever is less.

The third part of Task 1 (Task 1C) will be to measure bed sediment transport, which needs to occur after Task 1B is completed and during a higher flow period (natural or man-made). To help provide an estimate of sediment bedload transport, field staff will measure bedload sediment

[13] The pebble count procedure (Wolman 1954) is the measurement of 100 randomly selected stones from a homogeneous population on a river bed or bar, which yields reproducible size distribution curves for surficial deposits of gravel and cobbles. https://onlinelibrary.wiley.com/doi/pdf/10.1111/j.1752-1688.1997.tb04084.x,

transport at Site 4.2 and Site 6. Because this bedload estimate requires much higher flows than are desired for the cross-section surveys, this will likely be a separate field effort than Task 1B. The selection of a bankfull flow to record sediment transport is one of the key drivers of the sediment transport capacity in the system. Due to this sensitivity, three methods of evaluating the bankfull discharge will be utilized to estimate bankfull flows prior to collecting this data. The first will be the bankfull discharge identified in the field during the cross-section surveys. The second will be the bankfull discharge based on a return period flow of 1.5 years (evaluate range from 1.3 to 1.8-year return period). The third will be a calculation of bankfull area from USGS Stream Stats regional curves. These data will be reviewed for similarity and the best estimate of the bankfull discharge will be used to select the flow at which to measure the sediment transport.

SCE will facilitate measurements of bankfull sediment loads by releasing that desired flow into the channel along the full reach of Bishop Creek (to represent actual bankfull flows) to allow the sediment transport measurements to be determined. The flow will be stable (as judged by a local, temporary staff gage) for a minimum of 30 minutes prior to the start of sampling to minimize effects of the "first flush" of material that may mobilize and more accurately represent the sustained sediment transport capacity of Bishop Creek. Prior to performing the sediment transport measurements, a transect will be set up in the upper two-thirds of one of the riffles surveyed as a cross-section. Using this transect, a series of velocity (Marsh McBurney meter) and depth measurements will be recorded to calculate the actual discharge for comparison to local stream gages. Measurements of bedload transport will follow the USGS Field Methods for Measurement of Fluvial Sediment (2005). The bedload sampling will be completed utilizing a Helley-Smith bedload sampler. Due to anticipated particle sizes and the remote location, a three-inch by three-inch sampler will likely be required and will allow for reasonable data collection in this remote location. Should substrate larger than three-inch-diameter be noticed to be mobilizing during this study, the methods will be re-evaluated. Recordings of local water levels will be recorded every 30 minutes to ensure flow conditions are not changing during the data collection period. It should be noted that bedload sediment transport rates are highly variable, based on antecedent conditions, spatial and temporal variability, rate of flow change, and upstream geomorphic changes. Therefore, this single sample of transport rates will provide an estimate of bedload sediment transport in Bishop Creek, but it should be seen as an approximation and not an accurate recording of actual sediment transport.

The outcome of these field efforts will result in the following information that will be utilized in later analysis of sediment transport in Bishop Creek:

Site-wide Data

1. Pfankuch channel stability rating
2. Channel slope (elevation change divided by stream length)
3. Riffle Substrate D_{50} and D_{84}
4. Active bar D_{50} and D_{84} (if active bars are present at the site)
5. Bedload sediment measurements at S&G Site 4.2 and Site 6
6. D_{10}, D_{50}, D_{84}, and D_{100} for excavated sediments from previously excavated intake sediment disposal piles

Cross-section Specific Data

1. Bankfull cross-section area
2. Channel dimensions (width, depth, area)

3.6.5.2 TASK 2: ASSESSMENT OF LARGE WOODY MATERIAL

To evaluate the presence and potential mobility of LWM at each S&G monitoring site, field staff will record the size, quantity and likelihood of mobility of LWM in three zones; 1) the wetted channel (WET), 2) above the waterline to bankfull elevation (BKF) and 3) from bankfull up to an approximate elevation of twice the bankfull depth (to characterize LWM available in flood events; FLD). LWM that could be mobilized during flooding in the channel will be considered as any wood larger than 3-inches in diameter and four-feet-long that is not reasonably well anchored (e.g. well rooted, live vegetation, or mostly buried material will be excluded in this count). If substantial LWM exists in an area, the average size, length and approximate quantity will be noted. The study length for this assessment will be the same as the stream length utilized to measure stream slope (Section 6.1). The reporting for this assessment will include a summary comparison of LWM availability in the bankfull and flood-prone areas at each site. Data is anticipated to be collected on a form such as the one shown in Table 3-35.

TABLE 3-35 SAMPLE LWM DATA COLLECTION FIELD SHEET

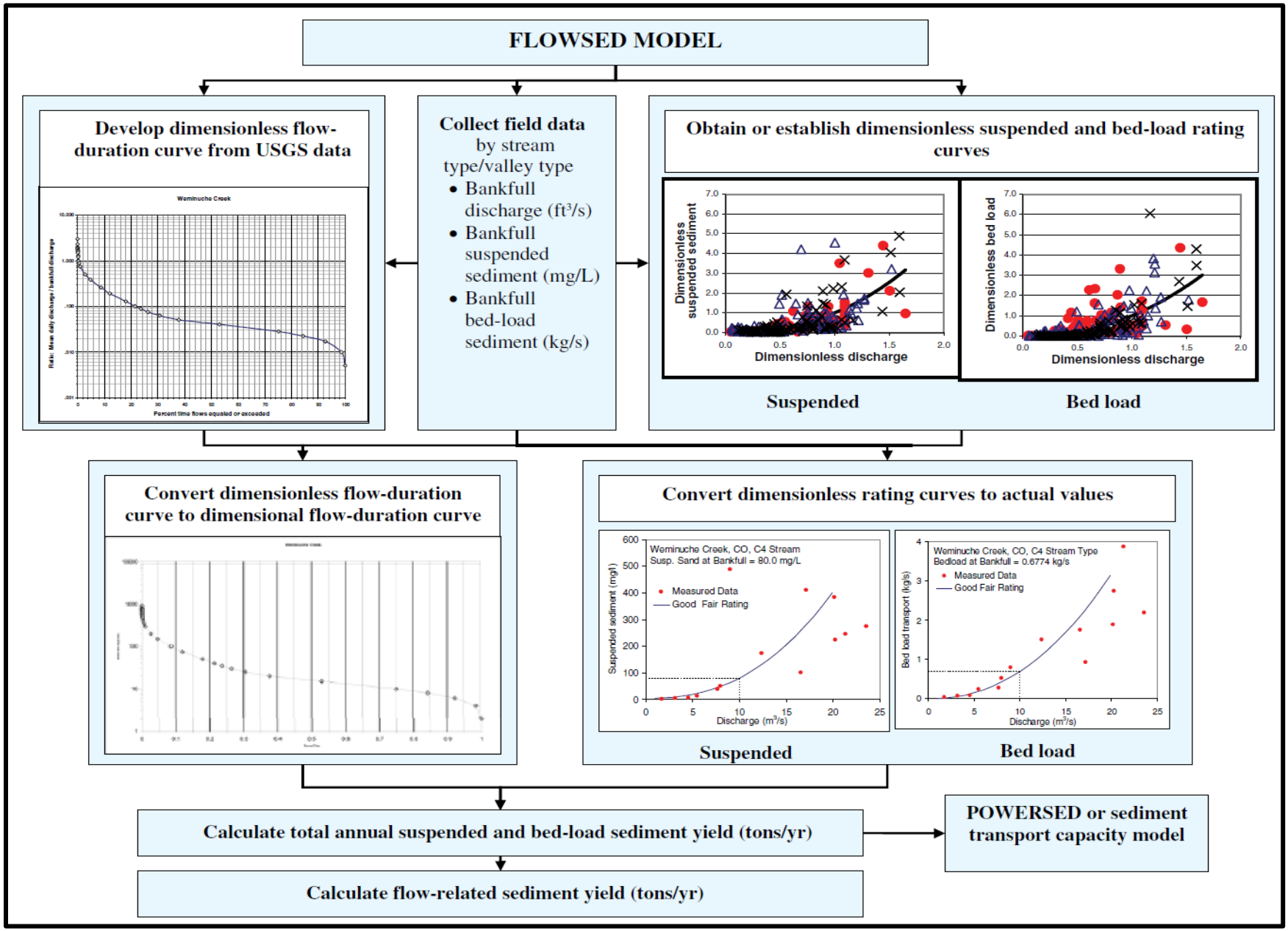
STREAM:			DATE:		
S&G SITE #:			OBSERVER:		
Stream station (ft)	**Zone (WET, BKF or FLD)**	**Size (dia. in inches)**	**Length (ft)**	**# of pieces**	**Likelihood of mobility (%)**
0+00	FLD	3	8	1	75

3.6.5.3 TASK 3: ANNUAL SEDIMENT LOADING ESTIMATION

Annual sediment loading will be estimated utilizing the FlowSed sediment transport model and data collected as part of Task 1: Field Surveys. This model utilizes field measurements (bankfull flow, bankfull sediment loading, substrate size) to estimate a sediment load utilizing regional sediment transport equations based on empirical data. FlowSed has been compared against other sediment transport models and has been shown to be one of the most accurate and easy to use sediment transport models (Hinton et al. 2018). Additionally, this model was developed in a similar physiographic province (e.g., glaciated, granitic rock) near Pagosa Springs, Colorado, but has proven to be relatively accurate across the United States, if local bedload measurements are utilized. A summary of the model is provided in Figure 3-13, but the model essentially utilizes a flow exceedance curve and a measurement of bankfull sediment transport to develop annual sediment loadings. This model is part of the RIVERMorph software package that is publicly available from RIVERMorph, LLC.

The data from the field will be loaded into FlowSED to estimate annual sediment loading at the most upstream site (Site 4.2, located between Plants 2 and 3) and the most downstream site (Site 6, above Plant 6) in this study area. Due to the complexity of collecting sediment transport measurements, sediment transport will only be measured at the discharge that is assumed to represent the bankfull discharge at Site 4.2 and Site 6. Since the model includes flows from the smallest to the largest at each site (through the flow duration curve), all flows are represented. However, if the sediment transport measurements are not taken at the bankfull discharge (e.g., due to the timing of sampling in relation to bankfull conditions during flow-event or a mis-identified bankfull discharge), the model will become less accurate. Therefore, the three methods of estimating bankfull mentioned previously will be used to best represent this parameter.

As stated previously, sediment transport modeling is an estimation of the actual conditions observed and not an exact science. Sediment transport capacity is anticipated to be relatively low overall, based on the infrequent sediment excavation in the impoundments, but this will be validated with sediment transport measurements and a comparison to the assessment of sediment in the investigated impoundments.



Source: USDA-NRCS 2007

FIGURE 3-13 GENERAL OVERVIEW OF THE FLOWSED MODEL

3.6.5.4 TASK 4: SUBSTRATE MOBILITY EVALUATION

To identify the mobility of sediment in the study reach, an evaluation of sediment mobility will be completed based on the data collected during the field effort. This will include an incipient motion calculation using the Shields equation (as used in the SLA Report). In addition to the Shields equation, particle mobility will be evaluated using empirical data collected for streams in Colorado and summarized in the River Stability Field Guide, Worksheet 3-14 (Rosgen 2014). The Rosgen (2014) equation tends to show particle mobility at lower flows than the Shields equation and can provide a range of sediment particle size mobility for a given depth/shear stress. The results of the Shields and Rosgen methods will be compared to the mobility anticipated in the SLA Report for the D_{65} and D_{84} particle size.

In addition to evaluating particle mobility under bankfull conditions, the flow depth and discharge will be calculated for the stream to mobilize the D_{65} and D_{84} particle size at each site. To evaluate the sediment mobility under flood conditions, the 25th percentile, 50th percentile, and the maximum annual peak flows (since bypass flows began) will be used to calculate the size of particles mobilized under these flows. This will provide insight into the effect of flood events on particle transport in Bishop Creek. To address the objective of understanding the sediment transport into reaches below Plant 6, the assumption is that the sediment mobilized at Site 6 would likely be transported past Plant 6 and become the sediment supply to the reach downstream of the Project.

3.6.5.5 TASK 5: FLUSHING FLOW EVALUATION

As part of the evaluation of sediment transport and LWM mobility, flushing flows will be considered as a means to mobilize sediment and LWM in Bishop Creek. These flushing flows would be of magnitude and duration to remobilize sediment and have been shown in other sites to restore some of the natural conditions (e.g., flushing of fine sediment, gravel bar creation, sediment deposition on floodplains) that may not be present in stream systems that are not free-flowing. Based on the findings of the prior tasks, an assessment of the potential impact of flushing flows will be qualitatively evaluated, including the feasibility of mobilizing sediment from the impound to lower reaches. Qualitative impacts on channel geomorphology, sediment transport, and impacts on existing habitat will be described. This task will include a description

of potential modifications to Project operations that may provide increased sediment and LWM transport through the impoundments. These modifications will be described a conceptual level after communication with SCE staff.

To address concerns regarding impacts to macroinvertebrates caused by modifications to the flow regime, the report will include a brief qualitative assessment on this topic. This assessment will incorporate findings from the Instream Flow Incremental Methodology (IFIM) Study Plan and this Study Plan to qualitatively assess potential impacts to macroinvertebrates in Bishop Creek due to any flushing flows that are being considered.

3.6.5.6 TASK 6: SEDIMENT AND GEOMORPHOLOGY STUDY REPORT

Sediment and Geomorphology Study Report will be prepared that describes the scope and objectives of this Study Plan, field methods, reviews the findings of Tasks 2 through 5, and provides, as appendices, key tables, plots, or figures.

3.6.6 SCHEDULE, PERIODIC REPORTING AND ONGOING CONSULTATION

The anticipated Study Plan development and implementation schedule is identified in Table 3-36 below. As described in the PAD and NOI, SCE anticipates seeking an expedited Study Plan determination process for some plans or for portions of some. This Study Plan is one that is anticipated to begin in 2019. It is anticipated that this study will commence with the reconnaissance visit in advance of the license application. During the scope of this study, SCE will submit quarterly progress memorandums to the TWG, or as determined with the input of this group. The following schedule is proposed for the implementation of this study.

TABLE 3-36 ANTICIPATED POST PAD/NOI STUDY PLAN DEVELOPMENT MILESTONES AND FERC PROCESS THROUGH STUDY PLAN DETERMINATION

TASK	RESPONSIBLE ENTITY	SCHEDULE MILESTONES
File NOI/PAD with FERC along with Final Study Plans	SCE	May 1, 2019
FERC Holds Scoping and Site Visit	FERC	July 1, 2019 – July 31, 2019
Deadline for Comments on PAD and Study Requests	Stakeholders	Aug 30, 2019
Preliminary Field Season[1]	SCE	2019
Fall TWG Workshop	SCE & TWG	Nov 2019
Request for waiver of 18 CFR 5.12 & 5.13	SCE	Sep 2, 2019
FERC Director's Study Plan Determination (assumes waiver granted)	FERC	Nov 8, 2019
First Field Season	SCE	2019
Initial Study Report (adjust as necessary in consultation with TWGs)	SCE	Nov 9, 2020
Second Field Season (as necessary)	SCE	2020
Final Study Report	SCE	Nov 9, 2021
License Application	SCE	June 2022

[1] Note: Because the 2019 field season precedes the Study Plan Determination is noted as "preliminary" because to avoid confusion with the FERC sequence of field season followed by Initial Study Report. For similar reasons, a fall TWG workshop is offered to review the results of the preliminary field season

This schedule is predicated on attaining agency agreement on the general goals, objectives and methods of the study, with the understanding that additional details may be worked out between the filing of the PAD and NOI, and the deadline for stakeholders to file comments on the PAD and make study requests. Table 3-37 summarizes consultation needs that must be completed before the study can be fully implemented. This table distinguishes between those items that require resolution before the study can be implemented, and those that would be the subject of ongoing consultation with the appropriate TWG. Table 3-38 provides an implementation sequence, following agreement on the final details of the plan.

TABLE 3-37 ANTICIPATED ADDITIONAL CONSULTATION TASKS

IMPLEMENTATION DETAIL FOR RESOLUTION	SCHEDULE FOR RESOLUTION
Discussion of need for evaluation of sediment sourcing and degree to which there is a Project nexus.	Prior to Study Plan Determination
Agreement on use of 3" sampler instead of 6" sampler proposed in initial draft.	Prior to Study Plan Determination
Final determination of implementation schedules	Prior to Study Plan Determination

TABLE 3-38 BISHOP CREEK SEDIMENT AND GEOMORPHOLOGY STUDY PLAN SCHEDULE

TASK	COMPLETION DATE
Task 1A – Field Reconnaissance Visit	August 2019
Task 1B – Field Data Collection – Transects	November 2019
Task 1C – Field Data Collection – Bedload Sediment	August 2020
Task 2 – Assessment of LWM	November 2019
Task 3 – Annual Sediment Loading Estimation	September 2020
Task 4 – Substrate Mobility Evaluation	September 2020
Task 5 – Flushing Flow Evaluation	October 2020
Task 6 - Sediment and Geomorphology Study Report	December 2020

3.6.7 STUDY PLAN CONSULTATION RECORD

This Study Plan was developed in consultation with the Bishop Creek Aquatic Resources 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 section summarizes the key consultation milestones for each Study Plan (Table 3-39), and how SCE addressed the comments received through the consultation process. This specific Study Plan was identified late in the consultation process and is therefore behind this timeline. SCE presented the Annotated Study Plan (via PowerPoint) during the October 10, 2018 TWG meeting, with the Draft Sediment and Geomorphology Study Plan was distributed on November 15, 2018. A revised version addressing comments was provided on March 12, 2019. This Final

Study Plan is anticipated to be filed with the PAD and NOI in April 2019. Table 3-40 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 3-40 provides a rationale based on Project specific information and FERC's Study Plan Criteria (18 CFR § 5.9).

TABLE 3-39 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	9/17/2018	TWG	8/14/2018 and 8/15/2018	8/31/2018
Draft Study Plans	11/15/2018	TWG	10/9/2018 to 10/11/2018, 2/26/2019	10/26/2018
Revised Study Plans	3/12/2019	N/A	N/A	3/18/2019
Proposed Study Plans (filed with PAD)	5/1/2019	TWG	6/12/2019 and 6/19/2019	7/12/2019

TABLE 3-40 SCE RESPONSES TO COMMENTS RECEIVED ON STUDY PLANS

COMMENT NO.	DATE OF COMMENT	ENTITY	COMMENT	SCE RESPONSE
1	10-10-2018	BryAnna Vaughn (Bishop Paiute Tribe)	Consider evaluating final deposition areas for sediment that passes through the Project to the area of Bishop Creek below Plant No. 6, as slugs of sediment have been seen moving through this reach.	There is limited flexibility in flow modification due to the Chandler Decree, but any proposed changes to sediment or flow dynamics will consider downstream impacts to minimize potential adverse habitat impacts.
2	10-10-2018	Nick Buckmaster (CDFW)	Recommend adding photo points to the Study Plan to document conditions.	Photo points will be added to each survey location to document existing conditions.
3	10-10-2018	Nick Buckmaster (CDFW)	Recommendation to locate sampling sites near the impoundment above the diversion dams to capture more likely sediment transport than would occur directly below a diversion dam from lateral moraines along the stream corridor. CDFW agrees with the exclusion of South Lake and Lake Sabrina in this Study Plan.	Reach cross-sections will be located towards the downstream end of each reach, above any backwater from the diversion dam, to best capture sediment mobilized in each reach.
4	1-19-2019	BryAnna Vaughn (Bishop Paiute Tribe)	Requested that the flow study include an assessment to determine the necessary flow to move sediment (that is transported below plant 6) all the way to the Owens River	Per our conversation with Ms. Vaughn on February 14, 2019, SCE clarified that it is their opinion that this downstream reach (below Plant 6) is generally outside the Project boundaries and can be significantly influenced by forces beyond the Project's control. To consider downstream users in any decisions regarding flow/sediment management, an objective was added to this study to "Understand potential sediment inputs and impacts from higher flows to reaches below Plant 6 from proposed changes in flow/operations." Further, SCE clarified that as currently envisioned, flow modifications, if proposed, are

COMMENT NO.	DATE OF COMMENT	ENTITY	COMMENT	SCE RESPONSE
				likely to occur infrequently, and not multiple times per year.
5	2-26-2019	Nick Buckmaster (CDFW)	CDFW recommends that the quantitative assessment of the sediment trapped in Project reservoirs include Intake 2, the South Fork Diversion to the Middle Fork, and the Weir pond to capture potential sediment inputs from the reach between the reservoirs and diverted reach.	As per our phone call on March 5, 2019 and the summary notes emailed on March 6, 2019, the mutually agreed-upon path forward was to focus on sediment mobilization in the free-flowing reaches of Bishop Creek and less on quantifying sediment assessment in the impoundments. Therefore, the study play was updated to reflect sieving of the previously excavated sediment, but no further quantitative assessment of impoundment sediments.
6	2-26-2019	Nick Buckmaster (CDFW)	Clarification on Comment 5 above – desire to estimate annual sediment inputs to Intake 2, the South Fork Diversion to the Middle Fork, and the Weir pond, as well as one downstream impoundment	As per our phone call on March 5, 2019 and the summary notes emailed on March 6, 2019, quantification of annual sediment inputs is no longer requested.
7	2-26-2019	Todd Ellsworth (USFS)	Does the Study Plan include an evaluation of sediment sourcing? This could be used to propose areas to stabilize in the future	The Study Plan does not anticipate an evaluation of sediment sourcing in the watershed, beyond a comparison of the historic cross-sections from the SLA Report locations, which will give an indication of any inputs from bank erosion. The Project does not control land management in the vicinity of Bishop Creek and therefore has no control over land use practices that may contribute to sediment loading. Therefore, sediment sourcing is not included in this Study Plan.

COMMENT NO.	DATE OF COMMENT	ENTITY	COMMENT	SCE RESPONSE
				Per follow-up email discussions, SCE will further discuss how to address questions about sediment sourcing in Bishop Creek in a subsequent TWG meeting once we can discuss the Project nexus more directly.
8	2-26-2019	Todd Ellsworth (USFS)	Does the study include an assessment of sediment inputs to the floodplains to promote the development of riparian vegetation?	The Study Plan does estimate sediment transport for a range of flows. This can be used with cross-section data to evaluate when sediment may reach the floodplain, but no specific evaluation of sediment inputs to the floodplain is proposed as an objective for this study.

3.6.8 REFERENCES

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4.0 HUMAN ENVIRONMENT AND COMMUNITY STUDY PLANS

4.1 RECREATION USE AND NEEDS STUDY PLAN (REC 1)

4.1.1 PROJECT NEXUS AND RATIONALE FOR STUDY

During TWG meetings, stakeholders identified the need to conduct a Recreation Use and Needs (RUN) Study to evaluate current recreation use and future recreation needs for the Project. This Study Plan details SCE's proposal for study objectives, study area, methods and a schedule for the effort.

Most recreation within or adjacent to the Project is located within the INF. Therefore, the INF has Federal Power Act Section 4(e) conditioning authority to prescribe conditions that may mitigate the impact of hydropower projects on INF system lands. Beyond the assessment of amenities within the Project boundary and required by the current license, it is reasonable to include other INF recreation sites that intersect or are immediately adjacent to the Project boundary, that may have been induced or could be indirectly affected by the presence of the Project. Further, trout angling is an important recreational activity occurring within the Project boundary, most notably at Project reservoirs and along portions of Bishop Creek. To the extent that Project operations induce or affect angling in the area, it is reasonable to include those sites in this study.

4.1.2 STUDY GOALS AND OBJECTIVES

This Study Plan includes the following goals and objectives:

- Characterize existing RUN
  - Conduct a basic inventory of facilities and amenities at each study site
  - Compile existing use data for historic and current use patterns
  - Identify current patterns of use (type, volume and daily)
  - Identify current patterns of public access to recreation opportunities
  - Survey to determine current user needs and preferences
- Characterize existing RUN of anglers in the study area
  - Compile existing use data for historic and current use patterns
  - Target anglers to determine current angler timing, demographics, effort, harvest, composition and success

  - Estimate catch-per-unit effort by species
- Evaluate adequacy of existing recreation opportunities to meet current needs
  - Determine the carrying capacity of existing recreation opportunities
  - Assess the suitability of facilities to provide universal access to recreation opportunities, where feasible
  - Assess the adequacy of existing public safety measures near Project features
- Estimate future Project-related recreational demand and needs
  - Estimate future use, demand and capacity
  - Assess the need for expansion or alteration of existing recreation facilities
- Ensure that future Project facilities and operations are not inconsistent with the Desired Conditions, Goals, Standards, and Guidelines described in the Land Management Plan for the Inyo National Forest (USDA 2018)

4.1.3 REVIEW OF EXISTING INFORMATION

This Study Plan will review and incorporate existing information related to RUN identified at the Project. The following is a brief description of studies and reports to be analyzed as part of this study:

1) *2015 Licensed Hydropower Development Recreation Report, FERC Form No. 80 (SCE 2015a)*

   Pursuant to the previous requirements of 18 CFR §8.11, the FERC Form No. 80 (Form 80) was designed to document overall recreation use of Project lands and waters at each development, as well as recreation use at all publicly available recreation amenities within the Project boundary. In 2014, SCE collected recreational use data at recreation facilities within the Project boundary to estimate annual use, peak season use, peak weekend use and capacity utilization of each amenity. SCE filed its most recent Form 80 reports on March 26, 2015, reporting recreational use data for the 2014 calendar year at Intake No. 2, Lake Sabrina and South Lake.

2) *2014 SCE Recreation Use Study Report for Eastern Hydro Division (SCE 2015a)*

   The main purpose of SCE's 2014 report was to gather the necessary data to complete the required Form 80 report. This report, however, goes into further detail and discusses more recreation sites than required by the Form 80 report.

3) *2015 California Statewide Comprehensive Outdoor Recreation Plan (SCORP) (CDPR 2015)*

   According to the California Department of Parks and Recreation (CDPR), California SCORP "provides a strategy for statewide outdoor recreation leadership and action to

meet the state's identified outdoor recreation needs" (CDPR 2015). While the 2015 SCORP does not offer specific data regarding current and future recreation needs, the following two reports are essential elements used in its development that provide information relevant to strategies and action priorities in the Sierra Planning Area: 2012 Survey on Public Opinions and Attitudes on Outdoor Recreation in California Complete Findings (CDPR 2014); and Outdoor Recreation in California's Regions 2013 (CDPR 2013).

4) *National Visitor Use Monitoring (NVUM) Reports for INF (USFS 2006, USFS 2011, USFS 2018d)*

   The NVUM Program has two goals: 1) produce estimates of the volume of recreation visitation to national forests and grasslands and 2) produce descriptive information about visitation, including activity participation, demographics, visit duration, measures of satisfaction and trip spending connected to the visit (USFS 2018d). The most recent visitor use report for the INF was updated on January 21, 2018, and summarizes data collected during fiscal year 2016. Visitor reports from 2006, 2011, and 2021 (when available) will also be analyzed and used in the final report associated with this study.

5) *INY Special Use Permits and Concessionaire Data*

   Data collected by the INF regarding management of recreation sites, specifically campgrounds and issuance of wilderness permits for dispersed use, will be a valuable resource in establishing existing use in the Project area.

6) *INF Alternative Transportation System Study (USDA 2013)*

   Transportation, parking, and visitor use data for the Bishop Creek Basin study area, collected in 2011, will be used as historical use data, to compare with the results of this study.

7) *CDFW Stocking and Historic Creel Survey Data*

   Very little recent or historical creel census data has been collected in the Project area. The CDFW conducted occasional surveys, most recently in North Lake in 2015 (local to, but not within the Project boundary). Prior to that, the most recent survey data available are from the South Fork Bishop Creek from August 1981. This study will build on the general format of past CDFW creel surveys by expanding the amount of user information obtained so that the timing and spatial distribution of angler use among Project facilities can be portrayed.

The study will also analyze relevant management plans for the area, including: Inyo County General Plan (IC 2001), Land Management Plan for the Inyo National Forest (USDA 2018), and the Bureau of Land Management's Bishop Resource Management Plan Record of Decision (BLM 1993).

4.1.4 STUDY AREA

The study area for this Study Plan will include all recreation facilities within the current Project boundary, as well as certain other INF recreation sites and access points that intersect or are immediately adjacent to the Project boundary. In addition to indirectly surveying recreationists for angling activities at the sites discussed above, certain areas and efforts will specifically target anglers, including South Lake, Lake Sabrina, and Intake No. 2 Recreation Areas and Forks, Big Trees and Four Jeffreys Campgrounds. Trail counters will also be utilized at three informal trails adjacent to the Project. Table 4-1 summarizes the specific sites to be included in this study.

TABLE 4-1 SURVEY AND DATA COLLECTION SITES

SITE ID[1]	NAME	GENERAL RECREATION SURVEY	CREEL SURVEY	TRAIL COUNTER
Middle Fork Bishop Creek				
MF01	Lake Sabrina Recreation Area[1]			
MF01a	*Sabrina Basin Trailhead & Informal Road Parking*	✓		
MF01b	*Lake Sabrina Boat Landing & Marina*	✓	✓	✓
MF02	Sabrina Campground	✓		
MF03	Bishop Park Campground	✓		
MF04	Bishop Park Group Campground	✓		
MF05	Intake No. 2 Campground	✓		
MF06	Intake No. 2 Recreation Area[1] (Day Use Area and Fishing Access)	✓	✓	
MF07	Forks Campground	✓	✓	
MF08	Big Trees Campground	✓	✓	
South Fork Bishop Creek				
SF01	South Lake Recreation Area[1]			
SF01a	*Weir Lake & Parking Area*	✓	✓	
SF01b	*South Lake Launching Facility, Marina, & Day Use Area*	✓	✓	
SF01c	*Bishop Pass Trailhead*	✓	✓	
SF01d	*Green Creek Diversion Trailhead & Day Use Area*	✓		✓
SF02	La Hupp Picnic Area	✓		
SF03	Willow Campground	✓		
SF04	Tyee Day Use Area	✓		
SF05	Table Mt Group Campground	✓		
SF06	Mountain Glen Campground	✓		
SF07	Four Jeffrey Campground	✓	✓	
Bishop Creek				
BC01	Bitterbrush Campground	✓		
BC02	Little Egypt Trail (informal access to climbing area)			✓
McGee Creek				
MC01	Longley Lake Trailhead	✓		

[1]Note: The only Project-required recreation facilities are the South Lake boat ramp, Lake Sabrina boat ramp, and Intake No. 2 fishing platforms (SCE 2014). All other facilities are non-Project.

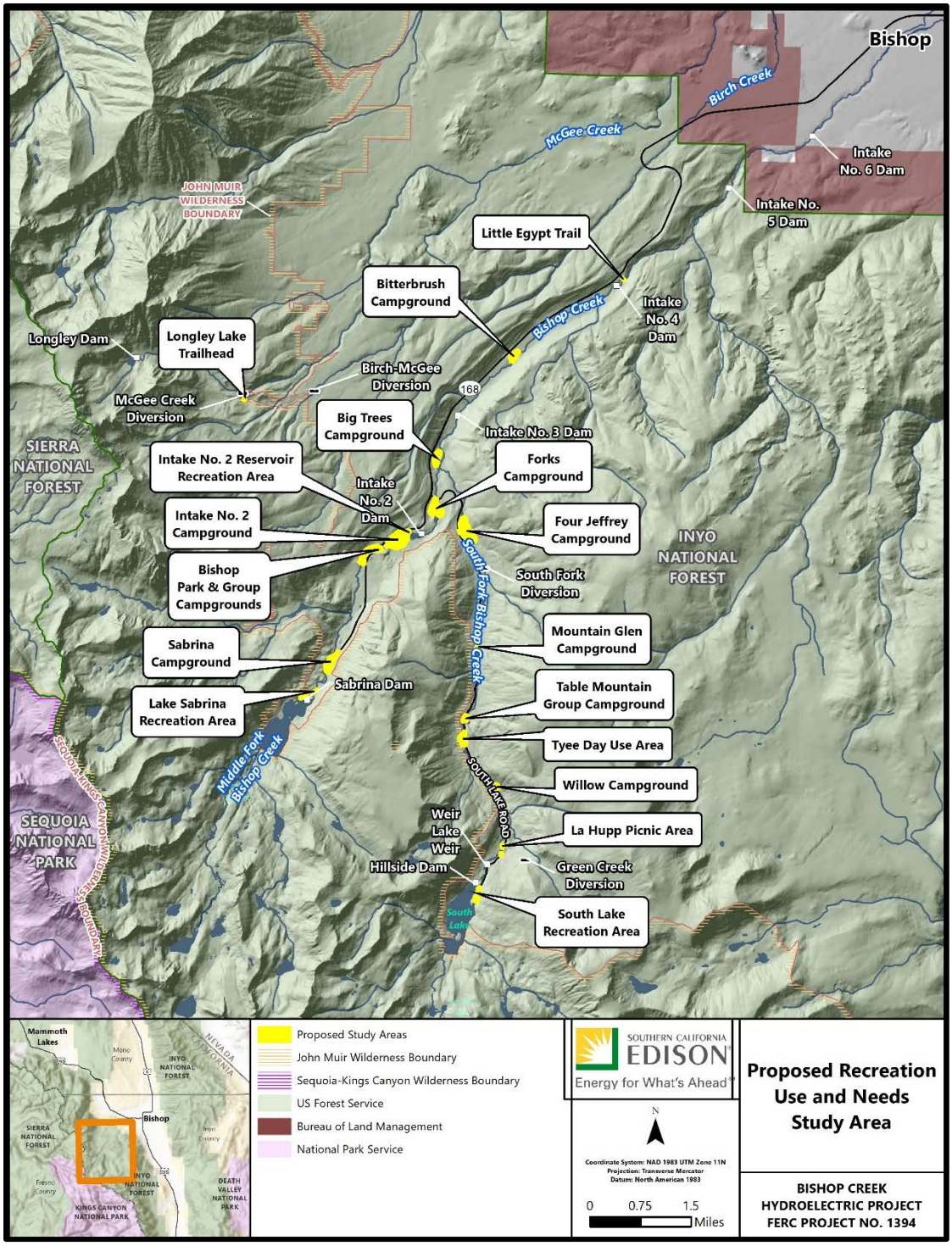

FIGURE 4-1 PROPOSED RECREATION USE AND NEEDS STUDY AREA

4.1.5 METHODS

To accomplish the goals and objectives of this study, SCE is proposing a variety of data collection techniques to compile both historic and current recreation use and needs patterns for the Project.

Historic use patterns will be determined by analyzing the studies, reports and management plans described in Section 4.0 of this Study Plan. Current use and needs information will be collected through a general recreation site inventory, spot counts, traffic and trail counter data, recreation surveys and creel surveys. A description of each collection technique is provided below.

4.1.5.1 GENERAL RECREATION SURVEYS

Visitor surveys will be conducted on-site using a survey form (available in both English and Spanish) at each general recreation survey site listed in Table 4-1 to collect recreation user characteristics and demographics (e.g., origin, gender, age and group size), satisfaction, type of activities, length of stay and perception of crowdedness, site conditions, fees and site needs. The survey form will also be made available online through a web address or QR code advertised at selected INF recreation areas. The data collected will be used to provide a general pattern of recreation use (e.g., type, volume and daily) and assist in the development of recreation use estimates for the Project area. The data will provide recreation user inputs on "crowdedness" and potential facility needs. An example survey form is included in Appendix D, and SCE will work with the INF to develop a final survey form prior to the 2020-2021 field seasons.

SCE will also collaborate with its consultant's data management and statistics team and the INF to determine an appropriate frequency of summer and winter general recreation surveys that would provide a statistically supported assessment of average use and adequate qualitative feedback regarding user perceptions and experience at each site. Surveys will be conducted in the 2020 and 2021 field seasons and will attempt to gather a representative sample of weekday, non-peak weekend, and peak weekend use.

All survey clerks for both the general recreation surveys and creel surveys discussed below will be trained thoroughly as a means of quality control. Survey clerks will be provided with detailed information on the study schedule, appropriate materials to aid in data collection and direction on appropriate interviewing techniques and attire.

While there is no direct nexus to the Project, an off-site survey form will also be developed with the INF prior to the 2020-2021 field seasons for the purpose of engaging users choosing to not visit the Bishop Creek watershed to understand the regional perception of the watershed and what recreational opportunities may not be present but are desirable by the general public. Similarly, INF is interested in learning whether or not there are aspects of the existing recreational opportunities in the Bishop Creek

watershed that deter users from visiting the area. This data will be collected predominantly from the INF's White Mountain Ranger District office in Bishop, CA, although online surveys may also be utilized. The off-site survey data will be compiled and analyzed separately from the relicensing general use survey, which will be administered and reported as previously discussed.

4.1.5.2 CREEL SURVEYS

Creel surveys will be conducted using a field data sheet (Appendix E) at each creel survey site listed in Table 4-1 to collect angler characteristics (e.g., origin, gender, age and group size), determine current angler timing, effort, harvest, composition, success, and an estimate of catch-per-unit effort by species.

Creel surveys will be conducted at least monthly on weekends during angling season (approximately May to October) with the intent of spending at least one hour at each designated survey point. Additional surveys may be opportunistically conducted by survey clerks encountering anglers while performing other studies such as the general recreation surveys. The objective will be to complete a combined total of at least 50 surveys at creel survey sites during the field season.

4.1.5.3 GENERAL RECREATION SITE INVENTORY

A basic inventory of general recreation facilities will be conducted using a facilities inventory form (Appendix F) at each recreation site listed in Table 4-1 in conjunction with initial survey activities. The type, number and size of facilities (including campsites, restrooms, parking areas, boat ramps and picnic tables) will be summarized and included in the final summary report.

4.1.5.4 SPOT COUNTS

Spot counts will be conducted at each recreation site listed in Table 4-1 in conjunction with the general recreation surveys outlined in Section 4.1.4. Spot counts will allow for documentation of the number of vehicles and trailers at each parking area as a means of estimating the number of users currently at the site along with weather, time, and license plate data.

4.1.5.5 TRAFFIC COUNTERS

Where traffic counters are currently installed to record the number of vehicles that enter and exit the recreation sites, a minimum of one year of traffic counter data will be collected and analyzed to help determine use and patterns of public access at the site. The number and location of traffic counters will be determined in consultation with the INF prior to the 2020-2021 field seasons.

4.1.5.6 TRAIL COUNTERS

At three locations, trail counter data will be collected and analyzed for a minimum of one year to determine use and patterns of informal access to the following informal trails adjacent to the Project boundary:

- Inlet Trail, as it is labeled on a map at the Lake Sabrina Boat Landing, where an informal trail has been created, extending from the marina along the western shore of Lake Sabrina to the Bishop Creek inlet.
- Green Creek Diversion Pipeline, where users are informally using of the pipeline right-of-way as a trail.
- Little Egypt Trail, an informal stream crossing and trail near SCE's Powerhouse No. 3 that is used to access the Little Egypt climbing area.

4.1.5.7 ANALYSIS AND REPORTING

The following sections provide a description of the approach to estimating existing and future recreational use, recreation site capacity and use density percentages, and recreation needs. A report will be prepared documenting the analysis results. The report will include a summary of all collected information and discussion of the analyses described below. The report will address all applicable Desired Conditions, Goals, Standards, and Guidelines of the Land Management Plan for the Inyo National Forest (USDA 2018).

4.1.5.7.1 CURRENT RECREATION USE AND DENSITY ESTIMATES

Average recreation use will be calculated utilizing spot counts, traffic and trail counters, and general recreation and creel survey data. For vehicle estimates, it will be assumed, on average, a total party size per vehicle of 2.5 people, as estimated in the INF's most recent NVUM report (USFS 2018d). Estimates will be categorized by site; site type; and activity based on weekday, weekend, holiday, morning, afternoon or evening use as well as by monthly total use. For the purposes of this study, the carrying capacity for a recreation site is defined as the number of vehicles and boat trailers that can be parked at a recreation site at one time, based on the number of available parking spaces associated with the particular site. For paved parking lots, this will be achieved by counting the number of designated parking spaces available at the recreation site. For unmarked parking, maximum vehicle space will be estimated. Use density at each site will be estimated based on the average number of vehicles observed divided by the parking capacity of that site.

4.1.5.7.2 FUTURE RECREATION USE ESTIMATES

Estimated projections of future recreation use will be developed using the average annual increase in population growth over the past 10 years, as reported by the U.S. Census Bureau. These estimates will be augmented with discussion of trends reported in the 2015 SCORP (CDPR 2015); 2006, 2011, 2016, and 2021 NVUM reports for INF (USFS 2006, USFS 2011, USFS 2018d), and Land Management Plan for the Inyo National Forest (USDA 2018). Estimated projections will be provided in 5-year intervals for the anticipated term of the license up to 50 years into the future.

While it is acknowledged that future changes in the supply of recreation resources, either in their quantity, accessibility and/or quality may influence future demand and use, the demand analysis undertaken for this study does not attempt to predict future changes or how they might specifically affect levels of use at Project facilities. Therefore, the demand analysis results should be viewed as a general guide of potential future recreation pressure developed for planning purposes only.

4.1.5.7.3 RECREATION NEEDS ASSESSMENT

Estimates of future Project-related recreational demand and needs will rely on the results provided by the recreation use assessment and visitor surveys for user preferences and opinions on needs and crowding.

The need for new recreation opportunities, new site development or modification of existing recreation resources will be assessed based on the results of facility condition assessments, site capacity estimates and user surveys that provide user preferences and opinions on needs and crowding at each site and the Project area as a whole. Based on these results, recommendations will be proposed to address future Project facilities and operations, consistent with the Desired Conditions, Goals, Standards, and Guidelines described in the Land Management Plan for the Inyo National Forest (USDA 2018), to then be discussed with the Recreation TWG.

4.1.6 SCHEDULE, PERIODIC REPORTING AND ONGOING CONSULTATION

The anticipated Study Plan development and implementation schedule is identified in Table 4-2 below. As described in the PAD and NOI, SCE anticipates seeking an expedited Study Plan determination process for some plans or for portions of some.

TABLE 4-2 ANTICIPATED POST PAD/NOI STUDY PLAN DEVELOPMENT MILESTONES AND FERC PROCESS THROUGH STUDY PLAN DETERMINATION

TASK	RESPONSIBLE ENTITY	SCHEDULE MILESTONES
File NOI/PAD with FERC along with Final Study Plans	SCE	May 1, 2019
FERC Holds Scoping and Site Visit	FERC	July 1, 2019 – July 31, 2019
Deadline for Comments on PAD and Study Requests	Stakeholders	Aug 30, 2019
Preliminary Field Season[1]	SCE	2019
Fall TWG Workshop	SCE & TWG	Nov 2019
Request for waiver of 18 CFR 5.12 & 5.13	SCE	Sep 2, 2019
FERC Director's Study Plan Determination (assumes waiver granted)	FERC	Nov 8, 2019
First Field Season	SCE	2020
Initial Study Report (adjust as necessary in consultation with TWGs)	SCE	Nov 9, 2020
Second Field Season (as necessary)	SCE	2021
Final Study Report	SCE	Nov 9, 2021
License Application	SCE	June 2022

[1] Note: Because the 2019 field season precedes the Study Plan Determination is noted as "preliminary" because to avoid confusion with the FERC sequence of field season followed by Initial Study Report. For similar reasons, a fall TWG workshop is offered to review the results of the preliminary field season

This schedule is predicated on attaining agency agreement on the general goals, objectives and methods of the study, with the understanding that additional details may be resolved between the filing of the PAD and NOI, and the deadline for stakeholders to file comments on the PAD and make study requests. As well, there are additional decisions and ongoing consultation needs throughout the implementation of the study. For this plan, the outstanding items for consultation are listed in Table 4-3. This table distinguishes between those items that require resolution before the study can be implemented, and those that would be the subject of ongoing consultation with the appropriate TWG.

TABLE 4-3 ANTICIPATED ADDITIONAL CONSULTATION TASKS

IMPLEMENTATION DETAIL FOR RESOLUTION	SCHEDULE FOR RESOLUTION
Discussion and agreement on survey instruments, staffing, methods, and study areas.	Prior to 2020 Study Season
Discussion and agreement on data analysis methods and reporting format.	Prior to 2020 Study Season
Development of study implementation schedule	Prior to 2020 Study Season

4.1.7 STUDY PLAN CONSULTATION RECORD

This Study Plan was developed in consultation with the Bishop Creek Recreation and Land Use 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 section summarizes the key consultation milestones for each Study Plan (Table 4-4), and how SCE addressed comments received through the consultation process. Table 4-5 is a Response to Comments Table for comments received from stakeholders, and how comments were addressed in the final Study Plan. If stakeholder comments or requests were not incorporated, Table 4-5 will provide rationale based on Project-specific information and the FERC Study Plan Criteria (18 CFR § 5.9).

TABLE 4-4 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
Proposed Study Plans (filed with PAD)	5/1/2019	TWG	6/12/2019 and 6/19/2019	7/12/2019

TABLE 4-5 SCE RESPONSES TO COMMENTS RECEIVED ON STUDY PLANS

COMMENT NO.	DATE OF COMMENT	ENTITY	COMMENT	SCE RESPONSE
1	8/31/2018	Tristan Leong, USFS	Inventory should include dispersed recreation use adjacent to developed sites, those not directly adjacent (e.g., roadside parking and access trails around reservoirs, dispersed camping at reservoirs), and those resource impacts related to this use. This use may indicate a need for additional services or facilities or change in recreation management. 200-foot buffer may not be sufficient around developed recreation sites- extend this distance as needed. Survey area needs further refinement and discussion.	SCE is ok with some focus on dispersed use, however, screening parameters should be agreed-to; not all impacts are directly related to the hydroelectric Project. SCE agrees that a 200-foot buffer is arbitrary and the dispersed impact extent of each recreation area should be determined in consultation with the TWG. The Study Plans will be edited to more generally assess sites for dispersed use since that use may extend beyond 200 feet, or reduced, depending on site topography and characteristics.
2	8/31/2018	Tristan Leong, USFS	Evaluate angler effort, harvest and success in Project affected waters.	This Study Plan will be revised to include an angler survey.
3	8/29/2018	Nick Buckmaster, CDFW	A separate assessment of angler catch/ fishery exploitation should be included (overlap with recreation TWG).	This Study Plan will be revised to include an angler survey.
4	8/15/2018 (TWG Meeting)	Nora Gamino, USFS	*Paraphrased from meeting discussion:* McGee Creek is not included in the study area and has fewer, more remote facilities, but we may want to consider its hiking facilities and roads, which are used for both mountain biking and hiking.	Facilities or sites associated with the McGee Creek area, most notably the trailhead for Longley Lake, will be assessed for inclusion in the study area.

COMMENT NO.	DATE OF COMMENT	ENTITY	COMMENT	SCE RESPONSE
5	8/15/2018 (TWG Meeting)	Diana Pietrasanta, USFS	*Paraphrased from meeting discussion:* User-created trails should be captured in this inventory. Specifically, there is an informal trail that extends three quarters of the way around Lake Sabrina that should be included in the study as it is not an official USFS trail and receives no maintenance money.	This can be assessed within the dispersed impacts analysis. Trail GIS data obtained from the USFS will be used to identify user-created trails that are not currently part of the USFS trail system and that may be Project induced. Initially, this will be a desktop exercise that will be ground-truthed.
6	10/10/2018 (TWG Meeting)	Nick Buckmaster, CDFW	*Paraphrased from meeting discussion:* Angler surveys should be conducted at campgrounds – specifically, Forks, Big Trees, and Four Jeffrey campgrounds – rather than at intakes – Plant 2, Plant 4, and Plant 5, as proposed –to capture perspectives from stream fishermen (as opposed to those primarily using the reservoirs for fishing). Further, the angler surveys at South Lake Recreation Area should include users at Weir Lake.	This Study Plan will be revised to replace angler survey locations at Plant 2, Plant 4 and Plant 5 with survey locations at Forks, Big Trees and Four Jeffrey campgrounds. Angler surveys conducted at South Lake Recreation Area will include users at Weir Lake.
7	7/18/2019 (USFS Letter Commenting on Study Plans) and 8/31/2019 follow-up meeting between USFS and SCE	USFS	INF wants the Recreation Areas (Lake Sabrina, South Lake, Intake 2) further defined as to what each recreation area includes: • Example: Lake Sabrina Recreation Area includes the inlet and nearby dispersed campsites (available only by boat) as well as the trail from the marina to the inlet of the lake. • South Lake Recreation Area includes the island, the inlet, any dispersed campsites around the lake and the Green Lake pipeline to the junction of the Green Lake trail.	The Study Plan has been revised to delineate the specific locations within each recreation area where general recreation or creel surveys or trail counters (Inlet Trail and Green Creek Diversion Pipeline) will be implemented. The assessment of dispersed use will be further defined in the Recreation Facilities Condition and Public Accessibility Study Plan.

COMMENT NO.	DATE OF COMMENT	ENTITY	COMMENT	SCE RESPONSE
8	7/18/2019 (USFS Letter Commenting on Study Plans) and 8/31/2019 follow-up meeting between USFS and SCE	USFS	Sampling at Weir Lake to determine capacity/use of area or include in South Lake Recreation Area.	Creel surveys and a general site assessment will be conducted at Weir Lake as part of this Study Plan, and the Recreation Facilities Condition and Public Accessibility Study Plan will assess the capacity and condition of the existing infrastructure.
9	7/18/2019 (USFS Letter Commenting on Study Plans) and 8/31/2019 follow-up meeting between USFS and SCE	USFS	INF wants on-site and off-site survey data. Off-site could be at visitor centers, but more importantly on-line and available to locals and recreating public. Remove the word "today" from the survey so it can be used by both the field going surveyors and in versions at the visitor centers and on-line. A Spanish version should be available and field going surveyors could be bilingual or have a card with the QR code.	Prior to the 2020 field season, SCE will collaborate with the INF to develop both on-site and off-site survey instruments and methodologies, including the use of Spanish and online survey instruments.
10	7/18/2019 (USFS Letter Commenting on Study Plans) and 8/31/2019 follow-up meeting between USFS and SCE	USFS	The off-site survey should include certain "qualifier questions" that are at the beginning of the off-site survey: • Are you visiting Bishop Creek today? If yes, continue to the regular version the survey. • If not today, have you ever visited Bishop Creek? If yes, proceed to the regular version of survey and answer questions based upon your best recollection of your most recent visit to the area. • Add question in survey "are you accessing wilderness?" Do you have	Prior to the 2020 field season, SCE will collaborate with the INF to develop off-site survey instruments and methodologies that incorporate these questions.

COMMENT NO.	DATE OF COMMENT	ENTITY	COMMENT	SCE RESPONSE
			a Wilderness permit for an overnight stay?	
11	7/18/2019 (USFS Letter Commenting on Study Plans) and 8/31/2019 follow-up meeting between USFS and SCE	USFS	Additional questions that should be included: • If you have never visited or don't recreate in the Bishop Creek, why not? • What is working to support your recreation activities in Bishop Creek drainage, what is not?	Prior to the 2020 field season, SCE will collaborate with the INF to develop off-site survey instruments and methodologies that incorporate these and/or similar questions.
12	7/18/2019 (USFS Letter Commenting on Study Plans) and 8/31/2019 follow-up meeting between USFS and SCE	USFS	Ask question: How many people are in your party, including yourself, rather than assuming every car has 2 people.	The on-site surveys will ask for the number of people in the participant's party. Spot count calculations will be increased to utilize 2.5 persons per vehicle as estimated in the 2016 NVUM report.
13	7/18/2019 (USFS Letter Commenting on Study Plans) and 8/31/2019 follow-up meeting between USFS and SCE	USFS	Expanded sampling frequency for planned recreation surveys. Need more survey days throughout main visitation season (recommend adding every weekend from June 15th - September 15 and 1 random week day each week during the same time period). A day of sampling should cover from 7am to 6pm to gather actual activities occurring in the three main Recreation Areas.	SCE will also collaborate with its consultant's data management and statistics team and the INF to determine an appropriate frequency of summer and winter general recreation surveys that would provide a statistically supported assessment of average use and adequate qualitative feedback regarding user perceptions and experience at each site. Surveys will be conducted in the 2020 and 2021 field seasons and will attempt to gather a representative sample of weekday, non-peak weekend, and peak weekend use.

COMMENT NO.	DATE OF COMMENT	ENTITY	COMMENT	SCE RESPONSE
14	(USFS Letter Commenting on Study Plans) and 8/31/2019 follow-up meeting between USFS and SCE	USFS	Demographic data should also be collected identical to the gray area questions at the beginning of the General Recreation Survey, as well as questions #1 and #2 (zip code and year of birth.)	Prior to the 2020 field season, SCE will collaborate with the INF to develop on-site survey instruments and methodologies.
15	(USFS Letter Commenting on Study Plans) and 8/31/2019 follow-up meeting between USFS and SCE	USFS	Include past NVUM data to inform future recreation use estimates and projections 2006/2011/2016 and 2021, when it's available.	NVUM reports from 2006, 2011, 2016, and 2021 (when available) will be incorporated into the final report's analysis of future recreation use estimates and projections.
16	(USFS Letter Commenting on Study Plans) and 8/31/2019 follow-up meeting between USFS and SCE	USFS	Consider possibly expanding the duration of creel surveys beyond one hour at each fishery site.	Surveyors will attempt to speak with all anglers present while on site, which may often take longer than an hour.
17	(USFS Letter Commenting on Study Plans) and 8/31/2019 follow-up meeting between USFS and SCE	USFS	Trail counters should be installed as well as traffic counters. Trail Counter to be installed from June 15th - September 15th at Green Lake pipe line, beyond the gauging station at South Lake Parking lot. Trail Counter to be installed from June 15th - September 15th, just beyond the fish cleaning station behind the marina, on the social trail to the inlet of Lake Sabrina.	At three locations, trail counter data will be collected and analyzed for a minimum of one year to determine overall use and seasonal use patterns of informal access to the following informal trails adjacent to the Project boundary: • Inlet Trail, as it is labeled on a map at the Lake Sabrina Boat Landing, where an informal trail has been created, extending from the marina

COMMENT NO.	DATE OF COMMENT	ENTITY	COMMENT	SCE RESPONSE
			Trail counter installed somewhere along the Little Egypt trail (TBD where and for how long.)	along the western shore of Lake Sabrina to the Bishop Creek inlet. • Green Creek Diversion Pipeline, where users are informally using of the pipeline right-of-way as a trail. • Little Egypt Trail, an informal stream crossing and trail near SCE's Powerhouse No. 3 that is used to access the Little Egypt climbing area.

4.1.8 REFERENCES

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4.2 RECREATION FACILITIES CONDITION AND PUBLIC ACCESSIBILITY STUDY PLAN (REC 2)

4.2.1 PROJECT NEXUS AND RATIONALE FOR STUDY

During TWG meetings, stakeholders identified the need to conduct a Recreation Facilities Condition and Public Accessibility Study to assess the condition of and accessibility to existing recreation facilities at the Project. The study will estimate future facility and accessibility needs, as well as analyze the economics of current and future O&M of Project-related recreation facilities. For the purposes of this Study Plan, Project-related recreation facilities are considered all facilities related to the South Lake, Lake Sabrina, and Intake No. 2 recreation areas, as described in Section 4.2.4. This Study Plan details the study objectives, study area, methods and schedule for the Recreation Facilities Condition and Public Accessibility Study.

Most recreation within or adjacent to the Project is located within the INF and therefore the INF has Federal Power Act Section 4(e) conditioning authority to prescribe conditions that may mitigate the impact of hydropower projects on INF lands. Therefore, beyond the assessment of amenities within the Project boundary and required by the current license, it is also reasonable to include other INF recreation sites and dispersed use that intersect or are immediately adjacent to the Project boundary, that may have been induced or could be indirectly affected by the presence of the Project.

4.2.2 STUDY GOALS AND OBJECTIVES

This Study Plan includes the following goals and objectives:

- For Project-related recreation areas, assess the condition of existing recreation facilities
  - Full facility condition assessment and inventory at existing recreation facilities directly related to the Project, including an evaluation of signage, public safety features, and visual and aesthetic qualities
  - Assess the condition and potential for universal accessibility, where feasible
  - Assess the condition of access roads and parking areas associated with Project-related recreation
- For both Project-related recreation areas and other recreation sites near the Project, document the presence of dispersed use outside of the boundary of developed recreation sites
  - Assess the carrying capacity and potential need for expansion, or alteration of existing recreation facilities

  - Assess the need to formalize or reclaim (due to environmental concerns) dispersed or informal use areas
- Analyze economics of current and future Project-related O&M of recreation facilities
  - Conduct an economic analysis to understand the current cost of ownership and maintenance performance by concessionaires
  - Analyze options for improving concessionaire agreements and/or leveraging funds or resources to help offset costs of facility improvements and ongoing O&M for recreation facilities
- Ensure that future Project facilities and operations are not inconsistent with the Desired Conditions, Goals, Standards, and Guidelines described in the Land Management Plan for the Inyo National Forest (USDA 2018) for Social and Economic Sustainability and Multiple Uses

4.2.3 REVIEW OF EXISTING INFORMATION

This Study Plan will review and incorporate existing information related to recreational access and condition of existing facilities at the Project. The following is a brief description of studies and reports to be analyzed as part of this study:

1) *2015 Licensed Hydropower Development Recreation Report, FERC Form No. 80 (SCE 2015a)*

   Pursuant to the previous requirements of 18 CFR §8.11, the Form 80 was designed to document overall recreation use of Project lands and waters at each development, as well as recreation use at all publicly available recreation amenities within the Project boundary. In 2014, SCE collected recreational use data at recreation facilities within the Project boundary to estimate annual use, peak season use, peak weekend use and capacity utilization of each amenity. SCE filed its most recent Form 80 report on March 26, 2015, reporting recreational use data for the 2014 calendar year at Intake No. 2, Lake Sabrina and South Lake.

2) *2014 SCE Recreation Use Study Report for Eastern Hydro Division (SCE 2015a)*

   The main purpose of SCE's 2014 report was to gather the necessary data to complete the required Form 80 report. This report, however, goes into further detail and discusses more recreation sites than required by the Form 80 report.

3) *2015 California SCORP (CDPR 2015)*

   According to the CDPR, California SCORP "provides a strategy for statewide outdoor recreation leadership and action to meet the state's identified outdoor recreation needs" (CDPR 2015). While the 2015 SCORP does not offer specific data regarding current and future recreation needs, the following two reports are essential elements used in its development that provide information relevant to strategies and action priorities in the

Sierra Planning Area: 2012 Survey on Public Opinions and Attitudes on Outdoor Recreation in California Complete Findings (CDPR 2014); and Outdoor Recreation in California's Regions 2013 (CDPR 2013).

4) *NVUM Reports for INF (USFS 2006, USFS 2011, USFS 2018d)*

The NVUM Program has two goals: 1) to produce estimates of the volume of recreation visitation to national forests and grasslands, and 2) to produce descriptive information about that visitation, including activity participation, demographics, visit duration, measures of satisfaction, and trip spending connected to the visit (USFS 2018d). The most recent visitor use report for the INF was updated on January 21, 2018, and summarizes data collected during fiscal year 2016. Visitor reports from 2006, 2011, and 2021 (when available) will also be analyzed and used in the final report associated with this study.

5) *INF Special Use Permits and Concessionaire Data*

Data collected by the INF regarding management of recreation sites, specifically campgrounds, and issuance of wilderness permits for dispersed use will be a valuable resource in establishing existing use in the Project area.

6) *INF Alternative Transportation System Study (USDA 2013)*

Transportation, parking and visitor use data for the Bishop Creek Basin study area, collected in 2011 will be used as historical use data, to compare with the results of this study.

The study will also analyze relevant management plans for the area, including: Inyo County General Plan (IC 2001), Land Management Plan for the Inyo National Forest (USDA 2018), and the BLM Bishop Resource Management Plan Record of Decision (BLM 1993).

4.2.4 STUDY AREA

Table 4-6 lists the sites to be studied in this effort. A full facility condition assessment will be performed by a landscape architect on the three recreation areas directly related to the Project: Lake Sabrina Recreation Area, South Lake Recreation Area and Intake No. 2 Recreation Area[14]. Both the three recreation areas and other INF recreation sites in the Project area will be assessed for dispersed use impacts. SCE will work with the INF to determine the scope of dispersed use assessment on a site by site basis to ensure that all impacts with a nexus to the Project are included in the study. This will generally include all developed facilities, reservoir shorelines, and islands

[14] A basic inventory of all sites will be conducted as part of the Recreation Use and Needs Study Plan.

within each reservoir. SCE's current understanding of facilities and dispersed use areas at these recreation areas to be assessed in this Study Plan include, but are not limited to:

Intake No. 2 (campground is assessed separately):

- Day use area adjacent to campground, including restroom facility and day use parking lot
- Fishing access, universally accessible fishing pier
- Fishing access, bank fishing along northern shore up to dam
- Informal trails, day use area to southeast side of reservoir

Lake Sabrina:

- Trailhead, Sabrina Basin Trailhead and associated information kiosk
- Fishing access, small lake behind weir below dam and south of bridge
- Informal parking, fishing access and Sabrina Basin Trailhead along road
- Boat launch area, Lake Sabrina Launching Facility
- Marina, Lake Sabrina Boat Landing
- Parking, Lake Sabrina Boat Landing, two lots, including restroom facilities
- Informal trail, along western shore of reservoir, called Inlet Trail on map at marina, much of this is out of Project boundary and in wilderness
- Informal camping, on south shore of reservoir, accessed by Inlet Trail and by boat, all of which is out of Project boundary and in wilderness

South Lake:

- Fishing access, Weir Lake
- Parking, Weir Lake
- Informal parking, along road between dam and Weir Lake
- Boat launch area, South Lake Launching Facility
- Marina, "Parchers Resort, South Lake Landing" on the sign at the ramp
- Parking, for boat launch
- Day use area, picnic tables along shore, between marina and dam
- Day use area, fishing/dock access south of ramp
- Parking, day use area, including restroom facilities
- Trailhead, Bishop Pass Trailhead and associated information kiosk
- Parking, for Bishop Pass Trailhead and Green Creek Diversion trail, including restroom facilities

- Picnic/day use area, two picnic tables along diversion trail just above parking area
- Informal camping, on ridge above boat ramp parking, on island in southern portion of reservoir, and other sites around reservoir as identified

TABLE 4-6 SITES TO BE STUDIED

SITE ID	NAME	FULL FACILITY CONDITION ASSESSMENT	DISPERSED USE ASSESSMENT ONLY
Middle Fork Bishop Creek			
MF01	Lake Sabrina Recreation Area[1]		
MF01a	*Sabrina Basin Trailhead & Informal Road Parking*	✓	
MF01b	*Lake Sabrina Boat Landing & Marina*	✓	
MF02	Sabrina Campground		✓
MF03	Bishop Park Campground		✓
MF04	Bishop Park Group Campground		✓
MF05	Intake No. 2 Campground		✓
MF06	Intake No. 2 Recreation Area[1] (Day Use Area and Fishing Access)	✓	
MF07	Forks Campground		✓
MF08	Big Trees Campground		✓
South Fork Bishop Creek			
SF01	South Lake Recreation Area[1]		
SF01a	*Weir Lake & Parking Area*	✓	
SF01b	*South Lake Launching Facility, Marina, & DUA*	✓	
SF01c	*Bishop Pass Trailhead*	✓	
SF01d	*Green Creek Diversion Trailhead & DUA*	✓	
SF02	La Hupp Picnic Area		✓
SF03	Willow Campground		✓
SF04	Tyee Day Use Area		✓
SF05	Table Mt Group Campground		✓
SF06	Mountain Glen Campground		✓
SF07	Four Jeffrey Campground		✓
Bishop Creek			
BC01	Bitterbrush Campground		✓
BC02	Little Egypt Trail (informal access to climbing area)		✓

Resource: SCE 2015a

[1]Note: The only Project-required recreation facilities are the South Lake boat ramp, Lake Sabrina boat ramp, and Intake No. 2 fishing platforms. All other facilities are non-Project.

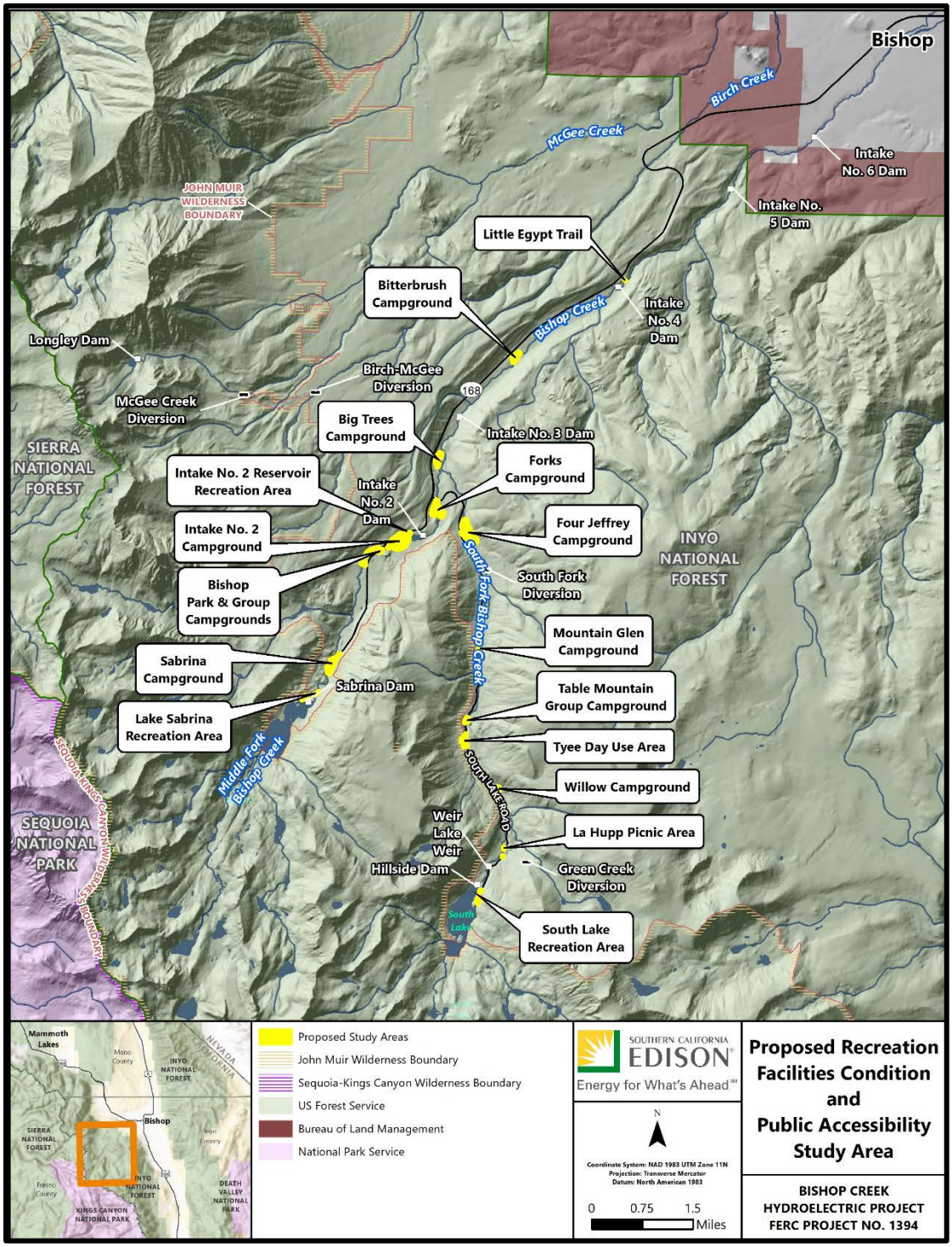

FIGURE 4-2 PROPOSED RECREATION FACILITIES CONDITION AND PUBLIC ACCESSIBILITY STUDY AREA

4.2.5 METHODS

4.2.5.1 FULL FACILITY CONDITION ASSESSMENT AND INVENTORY

A full facility condition assessment will be performed by a landscape architect on the three recreation areas directly related to the Project: Lake Sabrina Recreation Area, South Lake Recreation Area and Intake No. 2 Recreation Area. This inventory is intended to supplement and provide greater detail for these three recreation areas and will be collected in conjunction with the general site inventory associated with the Recreation Use and Needs Study Plan.

INF directives will be reviewed for condition assessment definitions and purposes to develop methods and forms for use in conducting condition assessments and facility inventories. Generally, the study will include an inventory and cursory condition assessment of the following within the study area:

- Specialized systems (e.g., water, electrical, septic);
- Building envelope, structural elements, and interior soundness;
- Systems and equipment to ensure they operate effectively and appropriately;
- Visual and aesthetic quality of facilities;
- Universal accessibility of facilities;
- Public safety measures;
- Signage and wayfinding; and
- Access roads, internal circulation roads, campsite spurs and parking areas.

The survey will ensure documentation of the current status of routine maintenance and equipment servicing and any items in need of correction, repair, replacement or similar action, noting facility condition according to Table 4-7. All inventories will be documented with photographs and integrated into a GIS database with relevant attributes to facilitate future analysis and ongoing assessments based on relevant attributes to facilitate future analysis and ongoing assessment.

TABLE 4-7 FACILITY CONDITION RATINGS TABLE

ID	CATEGORY	DESCRIPTION
N	Needs replacement	Facility is non-functional or has broken or missing components
R	Needs repair	Facility has structural damage or is in an obvious state of disrepair
M	Needs maintenance	Facility needs maintenance, such as cleaning or painting
G	Good condition	Facility is functional and well maintained

The need for new recreation opportunities, new site development, or modification of existing recreation resources will be assessed based on the results of a full facility condition assessments, dispersed use assessments, site capacity estimates, and user surveys that provide user preferences and opinions regarding needs and crowding for each site and the Project area as a whole. Based on these results, recommendations will be proposed to address future Project facilities and operations, consistent with the Desired Conditions described in the Land Management Plan for the INF (USDA 2018), and then discussed with the TWG.

A report will be prepared documenting the findings of this study. The report will include a detailed inventory and assessment of all site facilities and appurtenant features, including applicable maps and illustrations. The report will address all applicable Desired Conditions, Goals, Standards, and Guidelines of the Land Management Plan for the Inyo National Forest (USDA 2018).

4.2.5.2 DISPERSED USE ASSESSMENT

A dispersed use assessment will be conducted at certain sites as designated in Table 4-6[15]. This study will consist of an initial desktop exercise to scan aerial imagery for evidence of dispersed use or informal access areas such as social trails, brown out areas or impromptu parking around the perimeter of each study area. Aerial imagery will be used to define assumed perimeters of developed sites and will be generally assessed on a site by site basis to ensure that all impacts with a nexus to the Project are included in the study. These observations will be digitized and attributed within a GIS database to be used in a later field assessment to ground truth those potential dispersed uses and to further assess for signs of user-created roads, trails and/or campsites. Dispersed use

[15] Note that for Lake Sabrina, South Lake and Intake No. 2 Recreation Areas, the perimeter of and islands within each reservoir will be included in the assessment.

will be documented with photographs and integrated into a GIS database with relevant attributes (e.g., spatial location, number of fire rings, or length of roads or trails) to facilitate future analysis and ongoing assessment[16]. Additional qualitative information will be collected, including potential issues or possible accommodations or future recreation opportunities at the sites.

The need to formalize or discourage dispersed use will be assessed based on the results of this assessment, full facility condition assessments, site capacity estimates, and user surveys that provide user preferences and opinions on needs and crowding at each site and the Project area as a whole. Based on these results, recommendations will be proposed to address future Project facilities and operations, consistent with the Desired Conditions, Goals, Standards, and Guidelines described in the Land Management Plan for the Inyo National Forest (USDA 2018), to then be discussed with the Recreation TWG.

A report will be prepared documenting the findings of this study. The report will include the collected information, summarized in a narrative to include all observations and a visual representation of the observed dispersed use. The study will address all applicable Desired Conditions, Goals, Standards and Guidelines of the Land Management Plan for the Inyo National Forest (USDA 2018).

4.2.5.3 OPERATIONS AND MAINTENANCE ECONOMICS ASSESSMENT

A desktop study will be conducted to analyze the current economics of the O&M of the three recreation areas directly related to the Project: Lake Sabrina Recreation Area, South Lake Recreation Area and Intake No. 2 Recreation Area. Past operation costs will be gathered from INF and its concessionaires and analyzed in conjunction with data collected in the full facility condition assessment to determine the true costs of O&M these sites. Results of the full facility condition assessment will be reviewed to discuss emerging major maintenance activities and estimate future costs of operation.

A report will be prepared documenting the findings of this assessment and include the collected information and an analysis of current and future O&M. The report will address all applicable

[16] Dispersed use that extends outside of the 200-foot buffer will be analyzed on a case by case basis to determine if the full extent of dispersed use should be documented.

Desired Conditions, Goals, Standards, and Guidelines of the Land Management Plan for the Inyo National Forest (USDA 2018).

4.2.6 SCHEDULE, PERIODIC REPORTING AND ONGOING CONSULTATION

The anticipated Study Plan development and implementation schedule is identified in Table 4-8. As described in the PAD and NOI, SCE anticipates seeking an expedited Study Plan determination process for some plans or for portions of some plans.

TABLE 4-8 ANTICIPATED POST PAD/NOI STUDY PLAN DEVELOPMENT MILESTONES AND FERC PROCESS THROUGH STUDY PLAN DETERMINATION

TASK	RESPONSIBLE ENTITY	SCHEDULE MILESTONES
File NOI/PAD with FERC along with Proposed Study Plans	SCE	May 1, 2019
FERC Holds Scoping and Site Visit	FERC	July 1, 2019 – July 31, 2019
Deadline for Comments on PAD and Study Requests	Stakeholders	Aug 30, 2019
Preliminary Field Season[1]	SCE	2019
Fall TWG Workshop	SCE & TWG	Nov 2019
Request for waiver of 18 CFR 5.12 & 5.13	SCE	Sep 2, 2019
FERC Director's Study Plan Determination (assumes waiver granted)	FERC	Nov 8, 2019
First Field Season	SCE	2020
Initial Study Report (adjust as necessary in consultation with TWGs)	SCE	Nov 9, 2020
Second Field Season (as necessary)	SCE	2021
Final Study Report	SCE	Nov 9, 2021
License Application	SCE	June 2022

[1]Note: Because the 2019 field season precedes the Study Plan Determination is noted as "preliminary" because to avoid confusion with the FERC sequence of field season followed by Initial Study Report. For similar reasons, a fall TWG workshop is offered to review the results of the preliminary field season

This schedule is predicated on attaining agency agreement on the general goals, objectives and methods of the study, with the understanding that additional details may be resolved between the filing of the PAD and NOI, and the deadline for stakeholders to file comments on the PAD and make study requests. As well, there are additional decisions and ongoing consultation needs throughout the implementation of the study. For this plan, the outstanding items for consultation

are listed in Table 4-9. This table distinguishes between those items that require resolution before the study can be implemented, and those that would be the subject of ongoing consultation with the appropriate TWG.

TABLE 4-9 ANTICIPATED ADDITIONAL CONSULTATION TASKS

IMPLEMENTATION DETAIL FOR RESOLUTION	SCHEDULE FOR RESOLUTION
Discussion and agreement on study area, data to be collected, collection instruments, and methods for facilities condition and dispersed use assessments.	Prior to 2020 Study Season
Discussion and agreement on desktop O&M economic assessment methods and data analysis methods and reporting format for all assessments.	Prior to 2020 Study Season
Development of study implementation schedule	Prior to 2020 Study Season

4.2.7 STUDY PLAN CONSULTATION RECORD

This Study Plan was developed in consultation with the Bishop Creek Bishop Creek Recreation and Land Use 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 section summarizes the key consultation milestones for each Study Plan (Table 4-10), and how SCE addressed comments received through the consultation process.

Table 4-10 is a Response to Comments Table for comments received from stakeholders, and how comments were addressed in the final Study Plan. Where stakeholder comments or requests have not been incorporated, a rational has been provided. Table 4-11 provides a rationale based on Project specific information and the FERC Study Plan Criteria (18 CFR § 5.9).

TABLE 4-10 KEY STUDY PLAN DEVELOPMENT MILESTONES AND TECHNICAL WORKING GROUP PLANNING SCHEDULE

DELIVERABLE	MATERIAL DISTRIBUTED	MEETING TYPE	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
Revised Study Plans	11/15/2018	TWG	12/4/2018 to 12/6/2018	1/7/2019
Proposed Study Plans (filed with PAD)	5/1/2019	TWG	6/12/2019 and 6/19/2019	7/12/2019

TABLE 4-11 SCE RESPONSES TO COMMENTS RECEIVED ON STUDY PLANS

COMMENT NO.	DATE OF COMMENT	ENTITY	COMMENT	SCE RESPONSE
1	8/31/2018	Tristan Leong, USFS	Assessment should include Project visual and aesthetics discussion and evaluation.	SCE is considering this request but would like to discuss in more detail at the next TWG meeting to determine what specific gaps or needs would justify such an assessment. *Update*: Based on clarification and discussion in the October 2018 TWG meeting, SCE agrees to include a visual and aesthetics evaluation at South Lake Recreation Area, Lake Sabrina Recreation Area and Intake No. 2 Recreation Area.
2	8/31/2018	Tristan Leong, USFS	Assessment should include a description and catalog of all signage associated with public access and recreation.	An assessment of recreation, access and safety signage to Project related sites (Lake Sabrina Recreation Area, South Lake Recreation Area, Intake No. 2 Recreation Area) will be included in this Study Plan.
3	8/15/2018 (TWG Meeting)	Diana Pietrasanta, USFS	*Paraphrased from meeting discussion:* The 200-foot buffer on developed recreation sites seems arbitrary and should be expanded.	SCE agrees that the 200-foot buffer is arbitrary. The Study Plan will be edited to more generally assess sites for dispersed use because that use may extend beyond 200 feet in some cases. Dispersed impact assessments will be conducted at all sites listed in the Study Plan.
4	8/15/2018 (TWG Meeting)	Nora Gamino, USFS	*Paraphrased from meeting discussion:* McGee Creek is not included in the study area and has fewer, more remote facilities, but we may want to consider its hiking facilities and roads, which are used for both mountain biking and hiking.	Facilities or sites associated with the McGee Creek area, most notably the trailhead for Longley Lake, will be assessed for inclusion in the study area.
5	8/15/2018 (TWG Meeting)	Diana Pietrasanta, USFS	*Paraphrased from meeting discussion:* User-created trails should be captured in this inventory. Specifically, there are many informal climbing trails at Project reservoirs and an informal trail that extends three quarters of the way around Lake Sabrina that are not official USFS,	Trail GIS data obtained from the USFS will be used to identify user-created trails that are not currently part of the (USFS) trail system and that may be Project induced. Initially, this will be a desktop exercise that will be ground-truthed and expanded as additional trails are identified.

COMMENT NO.	DATE OF COMMENT	ENTITY	COMMENT	SCE RESPONSE
			trails and receive no maintenance money.	
6	7/18/2019 (USFS Letter Commenting on Study Plans)	USFS	INF wants the Recreation Areas (Lake Sabrina, South Lake, Intake 2) further defined as to what each recreation area includes: • Example: Lake Sabrina Recreation Area includes the inlet and nearby dispersed campsites (available only by boat) as well as the trail from the marina to the inlet of the lake. • South Lake Recreation Area includes the island, the inlet, any dispersed campsites around the lake and the Green Lake pipeline to the junction of the Green Lake trail.	The assessment of dispersed use at each recreation area will generally begin within a 200 foot buffer of all developed facilities, reservoir shorelines, and islands within each reservoir. SCE's current understanding of facilities and dispersed use areas at these recreation areas to be assessed in this Study Plan are described below: Intake No. 2 (campground is assessed separately): • Day use area adjacent to campground, including restroom facility and parking lot for day use area • Fishing access, universally accessible fishing pier • Fishing access, bank fishing along northern shore up to dam • Informal trails, day use area to southeast side of reservoir Lake Sabrina: • Trailhead, Sabrina Basin Trailhead and associated information kiosk • Fishing access, small lake behind weir below dam and south of bridge • Informal parking, fishing access and Sabrina Basin Trailhead along road • Boat launch area, Lake Sabrina Launching Facility • Marina, Lake Sabrina Boat Landing • Parking, Lake Sabrina Boat Landing, two lots, including restroom facilities

COMMENT NO.	DATE OF COMMENT	ENTITY	COMMENT	SCE RESPONSE
				• Informal trail, along western shore of reservoir, called Inlet Trail on map at marina, much of this is out of Project boundary and in wilderness • Informal camping, on south shore of reservoir, accessed by Inlet Trail and by boat, all of which is out of Project boundary and in wilderness South Lake • Fishing access, Weir Lake • Parking, Weir Lake • Informal parking, along road between dam and Weir Lake • Boat launch area, South Lake Launching Facility • Marina, "Parchers Resort, South Lake Landing" on the sign at the ramp • Parking, for boat launch • Day use area, picnic tables along shore, between marina and dam • Day use area, fishing/dock access south of ramp • Parking, day use area, including restroom facilities • Trailhead, Bishop Pass Trailhead and associated information kiosk • Parking, for Bishop Pass Trailhead and Green Creek Diversion trail, including restroom facilities • Picnic/day use area, two picnic tables along diversion trail just above parking area • Informal camping, on ridge above boat ramp parking, on island in southern portion of

COMMENT NO.	DATE OF COMMENT	ENTITY	COMMENT	SCE RESPONSE
				reservoir, and other sites around reservoir as identified The Recreation Use and Needs Study Plan has been revised to delineate the specific locations within each recreation area where general recreation or creel surveys or trail counters (Inlet Trail and Green Creek Diversion Pipeline) will be implemented.
7	7/18/2019 (USFS Letter Commenting on Study Plans)	USFS	Sampling at Weir Lake to determine capacity/use of area or include in South Lake Recreation Area.	This Study Plan will assess the capacity and condition of the existing infrastructure. Creel surveys and a general site assessment will be conducted at Weir Lake as part of the Recreation Use and Needs Study Plan
8	7/18/2019 (USFS Letter Commenting on Study Plans)	USFS	Include past NVUM data to inform future recreation use estimates and projections 2006/2011/2016 and 2021, when it's available.	NVUM reports from 2006, 2011, 2016, and 2021 (when available) will be incorporated into the final report's analysis of future recreation use estimates and projections.
9	7/18/2019 (USFS Letter Commenting on Study Plans)	USFS	Sites outside of the 200-foot buffer that we know are problems (islands, inlets, and social trails around lakes) should be identified and included.	The 200-foot buffer will be used as an initial indicator of dispersed use stemming from existing facilities or Project lands/waters. SCE will work with the INF to determine the scope of dispersed use assessment on a site by site basis to ensure that all impacts with a nexus to the Project are included in the study.
10	7/18/2019 (USFS Letter Commenting on Study Plans)	USFS	The use of the island in South Lake needs to be studied.	The use of the island in the southern portion of South Lake will be examined as part of the dispersed use assessment.

4.2.8 REFERENCES

Bureau of Land Management (BLM). 1993. Bishop Resource Management Plan Record of Decision. Bakersfield District, Bishop, CA.

California Department of Parks and Recreation (CDRP) 2015. 2015 Statewide Comprehensive Outdoor Recreation Plan. California Department of Parks and Recreation, Sacramento, CA.

California Department of Parks and Recreation (CDPR). 2014 and 2012. Survey on Public Opinions and Attitudes on Outdoor Recreation in California Complete Findings. California Department of Parks and Recreation, Sacramento, CA.

California Department of Parks and Recreation (CDPR). 2013. Outdoor Recreation in California's Regions 2013. California Department of Parks and Recreation, Sacramento, CA.

Inyo County (IC). 2001. Inyo County General Plan. Inyo County Planning Department, Bishop, CA.

Southern California Edison (SCE). 2015a. Form 80 and Recreation Report Filing: 2014 Recreation Use Study Report for Eastern Hydro Division.

U.S. Forest Service (USFS). 2006. Visitor Use Report, Inyo NF, USDA Forest Service, Region 5, National Visitor Use Monitoring Data collected FY 2006. United States Department of Agriculture.

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U.S. Forest Service (USFS). 2018d. Visitor Use Report, Inyo NF, USDA Forest Service, Region 5, National Visitor Use Monitoring Data collected FY 2016. United States Department of Agriculture.

United States Department of Agriculture (USDA). 2018. Land Management Plan for the Inyo National Forest. https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd589652.pdf.

United States Department of Agriculture (USDA). 2013. Inyo National Forest Alternative Transportation System Study. United States Department of Agriculture.

4.3 PROJECT BOUNDARY AND LANDS STUDY PLAN (LAND 1)

4.3.1 PROJECT NEXUS AND RATIONALE FOR STUDY

During TWG meetings, stakeholders identified the need to conduct a study that would evaluate the necessity for potential modifications to the Project boundary to account for future operation and maintenance (O&M) of Project facilities. This Study Plan details SCE's proposal for study objectives, study area, methods and schedule for the Project Boundary Lands and Roads Study.

According to FERC requirements (18 CFR §4.41), the Project boundary must encompass all lands necessary for Project purposes, including the O&M of the Project over the term of the FERC license. FERC further requires (18 CFR §11.2) that a licensee recompense the United States for the use, occupancy and enjoyment of its lands or its property. The annual charge for such use of government lands is calculated, in part, based on the amount of federal acreage within the Project boundary, and therefore a distinction must be made between federal and non-federal lands when filing a Project boundary and associated data. Therefore, this study will ensure that an accurate representation of both Project boundary and land classification is presented in a final license application.

4.3.2 STUDY GOALS AND OBJECTIVES

- This assessment will be designed as a desktop exercise to assess potential modifications to the Project boundary to account for future O&M of Project facilities.
  - Assess the current Project boundary for accuracy
  - Confirm base ownership of Project lands in terms of title, easements and other jurisdictional overlays
  - Assess the Project area for roads used predominantly for Project purposes
  - Assess the Project area for ancillary and unintended uses arising from authorized Project activities
- Determine if certain Project facilities will be removed or abandoned under the term of the next license, and how they will be treated, consistent with relevant management plans and objectives, including the Land Management Plan for the Inyo National Forest (USDA 2018).

4.3.3 REVIEW OF EXISTING INFORMATION

In performing this desktop exercise, the following existing information and data sources will guide the analysis:

- Approved Project boundary GIS data (filed 4-2-2010)
- Approved Project exhibit drawings
- Inyo County tax parcel GIS data
- Federal land ownership GIS data
- Aerial imagery
- Land Management Plan for the Inyo National Forest (USDA 2018)

Results of relicensing discussions and other Study Plans will guide this analysis, as they may lead to the proposed addition or removal of Project lands.

4.3.4 STUDY AREA

The proposed study area will include lands within current Project boundary or those lands that are identified throughout the relicensing process as having potential to be added or removed from the Project boundary.

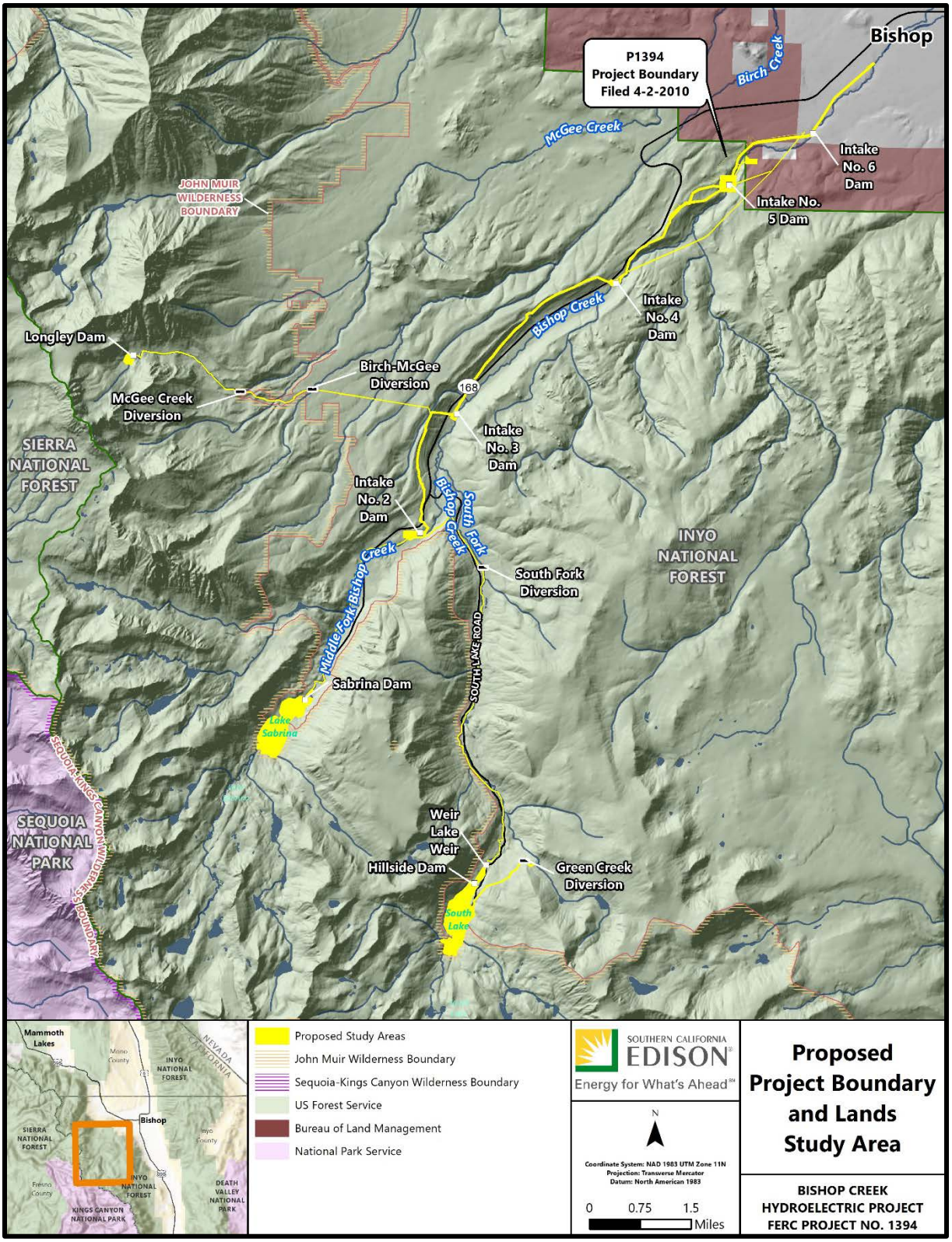

FIGURE 4-3 PROPOSED PROJECT BOUNDARY AND LANDS STUDY AREA

4.3.5 METHODS

To ensure that the Project boundary conforms with 18 CFR 4.41 (Exhibit G) requirements, SCE proposes the following methods to assess and potentially propose modifications to the Project boundary under the term of a new license.

1. *Assess the current Project boundary for accuracy*
    a. Compile currently filed and approved Project boundary GIS data and Exhibit G drawings.
    b. Analyze current boundary and adjacent lands within GIS software to determine any mapping errors, omissions, or potential removal or addition of lands to the future Project boundary.
2. *Assess current Project lands ownership information*
    a. Gather accurate land ownership data for all lands currently within or with the possibility to be added to the Project boundary.
    b. Ensure that Project lands are correctly distinguished within applicable GIS layers between federal and non-federal lands and further broken down by USFS and BLM lands.
3. *Assess Project area to identify roads currently or proposed to be used predominantly for Project purposes, such as operation, maintenance or access to Project recreation*
    a. Obtain most recent GIS data of USFS roads
    b. Identify roads currently or proposed to be used predominately for Project purposes, such as operation, maintenance, or access within the Project boundary for recreation

The results of other studies may influence potential modifications to the Project boundary. As relevant study results and analyses are completed, SCE will consult with USFS, BLM and other landowners to determine if other Project-related resource areas should be removed or included in the Project boundary.

4.3.6 SCHEDULE, PERIODIC REPORTING AND ONGOING CONSULTATION

The anticipated Study Plan development and implementation schedule is identified in Table 4-12. As described in the PAD and NOI, SCE is anticipating seeking an expedited Study Plan determination process for some plans or for portions of some plans.

TABLE 4-12 ANTICIPATED POST PAD/NOI STUDY PLAN DEVELOPMENT MILESTONES AND FERC PROCESS THROUGH STUDY PLAN DETERMINATION

TASK	RESPONSIBLE ENTITY	SCHEDULE MILESTONES
File NOI/PAD with FERC along with Proposed Study Plans	SCE	May 1, 2019
FERC Holds Scoping and Site Visit	FERC	July 1, 2019 – July 31, 2019
Deadline for Comments on PAD and Study Requests	Stakeholders	Aug 30, 2019
Preliminary Field Season[1]	SCE	2019
Fall TWG Workshop	SCE & TWG	Nov 2019
Request for waiver of 18 CFR 5.12 & 5.13	SCE	Sep 2, 2019
FERC Director's Study Plan Determination (assumes waiver granted)	FERC	Nov 8, 2019
First Field Season	SCE	2020
Initial Study Report (adjust as necessary in consultation with TWGs)	SCE	Nov 9, 2020
Second Field Season (as necessary)	SCE	2021
Final Study Report	SCE	Nov 9, 2021
License Application	SCE	June 2022

[1] Note: Because the 2019 field season precedes the Study Plan Determination is noted as "preliminary" because to avoid confusion with the FERC sequence of field season followed by Initial Study Report. For similar reasons, a fall TWG workshop is offered to review the results of the preliminary field season

This schedule is predicated on attaining agency agreement on the general goals, objectives and methods of the study, with the understanding that additional details may be worked out between the filing of the PAD and NOI, and the deadline for stakeholders to file comments on the PAD and make study requests. As well, there are additional decisions and ongoing consultation needs throughout the implementation of the study. For this plan, the outstanding items for consultation are listed in Table 4-13. This table distinguishes between those items that need resolution before the study can be implemented, and those that would be the subject of ongoing consultation with the appropriate TWG.

TABLE 4-13 ANTICIPATED ADDITIONAL CONSULTATION TASKS

IMPLEMENTATION DETAIL FOR RESOLUTION	SCHEDULE FOR RESOLUTION
Discussion and agreement on potential Project lands and roads.	During 2020 Study Season
Review and inventory types of ancillary and unintended uses arising from authorized Project activities that need to be assessed	During 2020 Study Season

4.3.7 STUDY PLAN CONSULTATION RECORD

This Study Plan was developed in consultation with the Bishop Creek Recreation and Land-Use 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 section summarizes the key consultation milestones for each Study Plan (Table 4-14), and how SCE addressed comments received through the consultation process. Table 4-15 is a Response to Comments Table for comments received from stakeholders, and how comments were addressed in the final Study Plan. Where stakeholder comments requests were not incorporated, Table 4-15 provides a rationale based on Project specific information and the FERC Study Plan Criteria (18 CFR § 5.9).

TABLE 4-14 KEY STUDY PLAN DEVELOPMENT MILESTONES AND TECHNICAL WORK 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
Revised Study Plans	11/15/2018	TWG	12/4/2018 to 12/6/2018	1/7/2019
Proposed Study Plans (filed with PAD)	5/1/2019	TWG	6/12/2019 and 6/19/2019	7/12/2019

TABLE 4-15 SCE RESPONSES TO COMMENTS RECEIVED ON STUDY PLANS

COMMENT NO.	DATE OF COMMENT	ENTITY	COMMENT	SCE RESPONSE
1	8/31/2018	Tristan Leong, USFS	License area - are there staging areas, material storage sites, etc. that are needed for Project operation fully listed in the Project description/maps?	These sites have not yet been defined in the Project description or associated figures. The Project description and associated figures will be updated to describe existing staging areas or spoil sites within the Project boundary. This study will assess whether current sites are adequately contained in the Project boundary and whether additional sites are being used or are needed for future operation.
2	8/15/2018 (TWG Meeting)	Nora Gamino, USFS	*Paraphrased from meeting discussion:* McGee Creek is not included in the study area and has fewer, more remote facilities, but we may want to consider its hiking facilities and roads, which are used for both mountain biking and hiking.	The roads leading to McGee Creek facilities will be assessed for inclusion in the Project boundary, most notably whether any roads are used solely for access to Longley Lake trailhead and are necessary for the Project purpose of recreation.

4.3.8 REFERENCES

United States Department of Agriculture (USDA). 2018. Land Management Plan for the Inyo National Forest. https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd589652.pdf.

4.4 CULTURAL RESOURCES STUDY PLAN (CULT 1)

4.4.1 PROJECT NEXUS AND RATIONALE FOR STUDY

During TWG meetings, stakeholders identified the need to conduct cultural resource studies including archaeological, built environment, traditional cultural properties (TCP), and tribal cultural resources. This Study Plan details the study objectives, study area, methods and schedule for the nonnative American TCPs, archaeological and built environment cultural resource studies. Native American TCPs and tribal cultural resources will be taken into account within the Tribal Resources Study Plan.

The HPMP will take into account direct and indirect effects of continued Project O&M on National Register of Historic Places (NRHP) listed or eligible Tribal Resources, including public recreation activities, may have an adverse effect on historic properties. The effect may be direct (e.g., result of ground-disturbing activities), indirect (e.g., public access to Project areas), or cumulative (e.g., caused by a Project activity or public access in combination with other past, present and reasonably foreseeable future projects). This study focuses on these potential Project effects to historic properties. Several terms used throughout this Study Plan warrant definition at the outset.

- ***Historic property(ies)***, as defined under 36 CFR §800.16(l) (1) are prehistoric or historic archaeological sites, buildings, structures, objects, districts, or TCPs included in, or eligible for inclusion in, the NRHP. Historic properties are identified through a process of evaluation against specific NRHP criteria in 36 CFR § 60.4.
- ***A district*** is a geographic area containing a significant concentration, linkage, or continuity of sites, buildings, structures, or objects united historically or aesthetically by plan and physical development. Examples of districts include (but are not limited to) prehistoric archaeological site complexes, hydroelectric projects, residential areas, commercial zones, mining complexes, transportation networks, rural villages, canal systems, irrigation systems, or large ranches (NPS 1997).
- ***Cultural Resource(s)***, for the purpose of this document, is used to discuss any prehistoric or historic-period district, archaeological site, building, structure, object, landscape, or TCR, regardless of its National Register eligibility.

Licensing of the Project is a federal undertaking; therefore, compliance with the National Historic Preservation Act (NHPA) is required. For historic properties, appropriate study areas are

defined by regulations under 36 CFR § 800 as the area of potential effects (APE). The APE for the Project is further defined in Section 4 of this Study Plan.

4.4.2 STUDY GOALS AND OBJECTIVES

- Meet FERC compliance requirements under Section 106 of the NHPA, as amended, by determining if Project-related activities and public access will have an adverse effect on historic properties.
- Identify all archaeological resources, built environment resources, and TCRs within the APE, determine which are historic properties, and develop the HPMP based on those results.
- Ensure that future Project facilities and operations are not inconsistent with the Desired Conditions described in the "Land Management Plan for the INF" (USDA 2018) for Social and Economic Sustainability and Multiple Uses.

4.4.3 REVIEW OF EXISTING INFORMATION

4.4.3.1 SUMMARY OF RECORD SEARCHES ARCHIVAL RESEARCH

The licensee conducted an initial search of records and maps on file at SCE archives, the INF, BLM, and the Eastern Information Center (EIC) of the California Historical Resources Information Center at University of California, Riverside. The purpose of this search was to gather existing information regarding previously recorded cultural resources within the APE, and to assess which areas of the APE had been surveyed previously. The record searches included all lands within the APE plus a study area extending 1 mile around all Project features. As noted in Section 4, the study area extends beyond the Project APE in order to facilitate the gathering of relevant existing information both within the APE and in the immediate vicinity.

Research revealed that the Project area is highly sensitive for archeological and historic-period built environmental resources and that many areas within the Project have already been surveyed. However, research also revealed both that some areas within the APE have not yet been surveyed and that some areas should be resurveyed to meet current professional standards. Therefore, to meet the Study Plan objective, additional information is needed. This Study Plan will be used to guide acquisition of that additional information.

4.4.3.2 PREVIOUS CULTURAL RESOURCES STUDY

One hundred twenty-one previous cultural resource investigations were identified within the study area (Table 4-16). Approximately 90 percent of the studies within the APE occurred more than 10 years ago, provide insufficient information in the reports to determine the adequacy of the survey coverage, or otherwise did not fully cover the areas included in those projects. Thus, portions of the APE will require a new survey to current professional standards.

TABLE 4-16 PREVIOUS CULTURAL RESOURCE STUDIES CONDUCTED WITHIN THE BISHOP CREEK HYDROELECTRIC PROJECT STUDY AREA

IC NUMBER	NADB NUMBER	USFS NUMBER	BLM REPORT NUMBER	AUTHOR(S)/YEAR	REPORT TITLE
IN-000026	1080265			King, Thomas F. 1973	Archaeological Impact Evaluation: Control-Casa Diablo Transmission Line, Southern California Edison Company, Phases I & II
IN-000113	1083235			Clay, Vicky L. And M.C. Hall 1988	Results of the 1987 Field Season Cultural Resources Survey for the Historic and Archaeological Preservation Plan for the Lee Vining Creek Hydroelectric Project (FERC #1388) and the Rush Creek Hydroelectric Project (FERC #1389)
IN-000114	1082268			Stornetta, S. 1984	An Intensive Archaeological Survey of a Proposed 115 kV Transmission Line, Dixie Valley, Nevada to Bishop, California
IN-000183	1081933			Crist, Michael K. 1982a	A Cultural Resource Reconnaissance of the Rancho Riata Hydroelectric Project, Inyo County, California
IN-000250	1082572	ARR #05-04-351		Hall, M.C. 1986	Report on a Cultural Resources Survey of Proposed Electrical Interconnection Routes, Inyo and Mono Counties, California: United States Bureau of Land Management, Los Angeles Department of Water and Power, and Southern California Edison Company Properties
IN-000265	1082743			Macko, M.E. 1986	Results of the 1986 Field Season, Cultural Resources Survey for the Historic and Archaeological Preservation Plan for the Bishop Creek Hydroelectric Project; Part I: Reservoirs, Powerhouses, Transmission Lines and Miscellaneous Facilities
IN-000266	1083231			White, David R.M. 1988a	An Evaluation of Significance for Archaeological Sites Discovered during the 1986 Field Season, Historic and Archaeological Preservation Plan for the Bishop Creek Hydroelectric Project (FERC Project 1394), Inyo County, California
IN-000267	1083252			York, A. 1988	Final Report: An Evaluation of Fifteen Archaeological Sites on the Bishop Creek Hydroelectric Project, Inyo County, California
IN-000278	1082794			Diamond, Valerie H., Stephen G. Hemlich, And Robert A. Hicks 1988	Evaluation of the Historic Resources of the Bishop Creek Hydroelectric System
IN-000279	1083232			Clerico, Robert And Ana Beth Koval 1986	An Architectural and Historical Evaluation of Structures Associated with The Bishop Creek Hydroelectric Power System, Inyo County, California

IC NUMBER	NADB NUMBER	USFS NUMBER	BLM REPORT NUMBER	AUTHOR(S)/YEAR	REPORT TITLE
IN-000305	1083254			Burton, Jeffery F. 1990	An Archaeological Survey of the Contel Mammoth to Bishop Fiber Optics Line, Mono and Inyo Counties, California
IN-000388	1084268			White, David R.M. 1992	Results of Archaeological Survey for Groundwater and Riparian Vegetation Studies in Connection with the Lundy and Bishop Creek Hydroelectric Projects, Mono and Inyo Counties, California
IN-000389	1084269			White, David R.M. 1992	Results of Subsurface Testing at CA-INY-4500, A Sparse Lithic Scatter Located along Bishop Creek, Inyo County, California
IN-000442	1084586			Burton, Jeffery F. 1994	An Archaeological Survey of the Eastern Sierra College Center, Inyo County, California
IN-000624				Jordan, Stacey C. 2006	Archaeological Survey Report for the Southern California Edison Company Tap Control--Inyo Fiber Optic Cable Project Inyo County, California (WO#8458-0461)
IN-000842				White, David R.M. 1989	Management Plan for Historic and Archaeological Resources Associated with the Historic and Archaeological Preservation Plan for the Bishop Creek Hydroelectric Project (FERC Project 1394), Inyo County, California
IN-000859			BLM-C-S9	Hemphill, M.L. 1987	Report on a Cultural Resources Survey of Proposed Electrical Interconnection Routes, Inyo and Mono Counties, California: United States Bureau of Land Management, Los Angeles Department of Water and Power, and Southern California Edison Company Properties
IN-000884				Manske, K. and M.A. Giambastiana 2007	Class III Cultural Resource Inventory for the Replacement of One Utility Pole on the Southern California Edison Control-Mt. Tom 55 kV Line, Inyo County, California
IN-000912				Pollock, Katherine H. 2008a	Archaeological Assessment Report Bishop Creek Hydroelectric Project (FERC Project No. 1394), Intake 3, 4, 5, and 6 AVM Replacements, Inyo National Forest, Inyo County, California
IN-00099	1081091	ARR #05-04-0081		Miller, Brian 1980b	Archaeological Reconnaissance of Starlite Estates Water Diversion
IN-00102				Miller, Brian 1980a	Archaeological Reconnaissance Report - Sabrina Campground Rehabilitation
IN-00123	1083557			Cutts, Janette S. 1989	An Archaeological Reconnaissance Report: High Desert Off Highway Vehicle (OHV) Inyo and Mono Counties, California
IN-00125	1081364	ARR #05-04-0115		Faust, Nicholas 1980b	Archaeological Reconnaissance Report - Bishop Creek Canyon Recreation Development Project
IN-00129	1081380	ARR #05-04-0040		Miller, Brian C. 1976	Archaeological Reconnaissance Report: South Lake Road Construction
IN-00141	1081571			Faust, Nicholas 1980a	Archaeological Reconnaissance Report - Coyote Creek Unmanned Entrance Station

IC NUMBER	NADB NUMBER	USFS NUMBER	BLM REPORT NUMBER	AUTHOR(S)/YEAR	REPORT TITLE
IN-00144	1081581	ARR #05-04-0220		Taylor, W. 1981	Archaeological Reconnaissance Report - Winter Parking, CA (Highway) 168
IN-00147	1081608	R1979050400088		Miller, Brian C. 1979	Archaeological Reconnaissance Report: North Lake Campground Well
IN-00148	1081609	ARR #05-04-0083		Miller, Brian 1981	Archaeological Reconnaissance Report - Willos Campground Waterline and Well/Spring
IN-00149	1085132	HRR #05-04-83-1		Sawinski, Tamara 1997	Heritage Resources Report - Willow Campground Trail
IN-00169	1081707	ARR #05-04-0257		Crist, Michael K. 1982b	A Cultural Reconnaissance of the Horton Creek Hydroelectric Project, Inyo County, California
IN-00191	1081996			Firby, Valerie 1982	A Historic Overview of the Wilshire-Bishop Creek (Cardinal) Mine
IN-00192	1081997			Zeier, Charles D., Valerie Firby, and Jane Russell Armstrong 1982	An Intensive Archaeological Reconnaissance of the Bishop Creek Powerhouse No. 1 Project Area, Inyo County, California
IN-00203	1081769	ARR #05-04-0243		Farrell, Mary 1982	Archaeological Reconnaissance Report - Cataract Road Relocation
IN-00222	1082195	ARR #05-04-0278		Miller, Brian 1983	Archaeological Reconnaissance Report - Bishop Creek Road Realignment (Flood Damage)
IN-00230	1082265	R1984050400318		Snyder, Toni 1984	Archaeological Reconnaissance Report: Sabrina and South Lake Boating Facilities
IN-00235	1082354			Weaver, R.A. 1985	Archaeological Reconnaissance Report: Saga Mineral Exploration
IN-00243	1082425			Macko, Michael E. and Jill Weisbord 1985	Sylmar Expansion Project: Cultural Resources Inventory and Significance Evaluation - Final Report--Cultural Resource Use Permit No. 16053
IN-00247	1082482	ARR #05-04-0331		Miller, Brian 1986	Archaeological Reconnaissance Report - Parcher's Resort Rehabilitation
IN-00251	1084231			Hall, M.C. 1987	Recommendations Regarding the National Register Eligibility of Cultural Resources Sites on a Proposed Electrical Interconnection Route, Inyo and Mono Counties: US BLM Lands
IN-00252	1084253			Hall, M.C. 1990	The Oxbow Archaeological Incident Investigations at Twenty-Three Locations between Owens Valley, Eastern California and Walker Basin, Southwestern Nevada
IN-00264	1082599			White, David R.M. 1986	Results of the 1986 Field Season, Cultural Resources Survey for the Historic and Archaeological Preservation Plan for the Bishop Creek Hydroelectric Project (FERC Project 1394), Inyo County, California; Part II, South Fork Diversion

IC NUMBER	NADB NUMBER	USFS NUMBER	BLM REPORT NUMBER	AUTHOR(S)/YEAR	REPORT TITLE
IN-00290	1082840			Miller, Brian 1987	Archaeological Reconnaissance Report: Starlight Well and Grazing Stations
IN-00292	1082842			Mapel, Tim 1987	Archaeological Reconnaissance Report: Buttermilk Meadows Rehabilitation Project
IN-00295	1082957			White, David R.M. 1988b	Cultural Resources Inventory for Proposed Modification of the Spillway on Intake Number Two Dam, Bishop Creek Hydroelectric Project (FERC Project 1394) Inyo County, California
IN-00325	1083301	ARR #05-04-474		Reynolds, Linda A. 1988	Archaeological Reconnaissance Report: Big Trees Campground Test Drill Holes/SCE
IN-00393	1084307	CRR #05-04-588		McLean, Vernon 1992	Cultural Resources Report #05-04-588, White Mountain Spring Developments
IN-00408	1084391	HRR NO.05-04-593		Reynolds, Linda A. 1993	Cultural Resources Report, Parson's Small Tract Act/Starlight
IN-00423	1084513			Valdez, Sharynn-Marie and Nelson Siefkin 1993	Archaeological Survey Report of Bishop Creek No. 3 Flowline Replacement Project, Inyo County, California
IN-00450	1084623	HRR #05-04-639		Cutts, Janette and Linda Reynolds 1994	Heritage Resources Report: Campground Accessibility Upgrades 1994
IN-00453	1084653	HRR #05-04-642		Cutts, Janette S. 1994	Heritage Resources Report: Hornick-Cutts Wedding Special Use Permit
IN-00458	1084669			Hall, M.C. 1994	Cultural Resources Survey of a Proposed Fence Line around Department of Fish and Game Land in the Buttermilk Country, Eastern Sierra Nevada, Inyo County, California
IN-00473	1084838	HRR #05-04-670		Klein, Bruce A. 1995	Heritgate Resources Report: Bishop Creek Sewer Ponds
IN-00475	1084878	HRR #05-04-651		Reynolds, Linda A. 1994	Heritage Resources Report: Piute Pass Capital Improvement Project, Inyo County, California
IN-00533	1085099			Burton, Jeffery F. 1997	An Archaeological Survey of the Coyote Valley Road Aggregate Site Near Bishop, Inyo County, California
IN-00536	1085139	HRR #. 05-04-643		Reynolds, Linda and Marilyn Loughrey 1998	Heritage Resources Report: Climbing Shoe Demo Day; Recreation Event
IN-00539	1085145	R1997050400749		Loughrey, Marilyn 1998	Heritage Resources Report: Bishop Creek Rec. Residence Septic Tank Installation
IN-00574	1085603	HRR #05-04-766		Faust, Nicholas 1999	Heritage Resources Report Bishop Creek Recreation Enhancement
IN-00591	1082208	ARR #05-04-0319		Teixeira, Serna S. 1984	Archaeological Reconnaissance Report: Bishop Creek Treatment Plant Fence
IN-00623			BLM - CA-170-05-11	McCormick, Erica D. 2004	Cultural Resources Inventory Report (Yaney Mine Closures)

IC NUMBER	NADB NUMBER	USFS NUMBER	BLM REPORT NUMBER	AUTHOR(S)/YEAR	REPORT TITLE
IN-00684		HRR No. 05-04-660		Cutts, Janette S. 1995	Heritage Resources Report (Sabrina Trail Maintenance and Reconstruction)
IN-00696				Jordan, Stacey C. and K. Ross Way 2004	FINAL: Archaeological Survey Report Southern California Edison, Bishop Plant 2 New Circuit Installation, Tungsten Hills Area, Inyo National Forest, Inyo County, California
IN-00698		HRR No. 2004-05-04-00802		Hilton, Michael R. 2005c	Heritage Resources Report (White Caps Mill Site CERCLA Response Action)
IN-00699		HRR No. 2004-05-04-01076		Hilton, Michael R. 2005d	Heritage Resources Report (Buttermilk Mountains Common Garden)
IN-00700		R2004050400984		Faust, Nicholas 2005	Heritage Resources Report: Horse Creek Prescribed Fire Project
IN-00792				Hilton, Michael R. 2007b	HRR No. 2007-05-04-01261, Heritage Resources Report, Rainbow Pack Station Spring Box Replacement
IN-00828				Hilton, Michael R. 2007a	HRR: No. 2008-05-04-01193, Heritage Resources Report
IN-00858		HRR No. 2004-05-04-01073(b)		Hilton, Michael R. 2005b	Heritage Resources Report: Off-Highway Vehicle (OHV) Route Designation Strategy
IN-00861		R2002050400897		Mountain Heritage Associates 2003	Archaeological Survey of Recreation Residence Tracts in the Inyo National Forest
IN-00864		HRR No. 2004-05-04-01073		Hilton, Michael R. 2005a	Heritage Resources Report: Off-Highway Vehicle (OHV) Route Designation Strategy
IN-00888		R2010050401450		Catacora, Andrea 2008b	Letter Report: Negative Cultural Resources Inventory Letter Report for Work Order 4770-0346 and 4703-0401
IN-00892				Catacora, Andrea 2008a	Letter Report: Southern California Edison Monitoring Work, W.O. 4770-0081, J.O. 2090
IN-00895				Schmidt, James J. 2009	Letter Report: Forks Fire Emergency Monitor/Survey Program, Inyo National Forest, Bishop and Horse Creek Areas, Inyo County, California
IN-00911		R2008050401320		Pollock, Katherine H. 2008c	Archaeological Assessment Report Bishop Creek Hydroelectric Project Green Creek Diversion Dam and Flowline Retirement, Inyo National Forest, Inyo County, California
IN-00928				Leach-Palm, Laura, Paul Brandy, Jay King, Pat Mikkelsen, Libby Seil, Lindsay Hartman, Jill	Cultural Resources Inventory of Caltrans District 9 Rural Conventional Highways in Inyo, Eastern Kern, Mono, and Northern San Bernardino Counties, Summary of Methods and Findings

IC NUMBER	NADB NUMBER	USFS NUMBER	BLM REPORT NUMBER	AUTHOR(S)/YEAR	REPORT TITLE
				Braden, Bryan Larson, and Joseph Freeman 2010	
IN-00935		R2010050401496		Switalski, Hubert and Andrea Bardsley 2011	Heritage Resources Inventory Report for the Southern California Edison Company's Replacement of Four Deteriorated H-Frame Structures on the Casa Diablo-Control 115kV Transmission Line (4750-1613) and One Deteriorated Pole Structure on the Sabrina 12kV Distribution Circuit (6085-4800, 0-4828), Inyo National Forest, Bishop Creek and Lake Crowley, Inyo and Mono Counties, California
IN-00948				Switalski, Hubert 2009	Archaeological Survey Report for the SCE Co's Replacement of 17 Deteriorate Power Poles
IN-00964		R2010050401533		Sibley, Krisstin I. and Mark A. Giambastiani 2011	Final Report: An Archaeological Survey for the Sabrina Bridge Replacement Project, Northern Inyo County, California
IN-01001				O'Neil, Laura 2013	Historic American Engineering Record, Bishop Creek Hydroelectric System, Hillside Dam
IN-01019				Basgall, Mark E. and Michael G. Delacorte 2012	Middle Archaic Cultural Adaptations in the Eastern Sierra Nevada, Data Recovery Excavations at CA-INY-1384/H, INY-6249/H, INY-6250, and INY-6251/H
IN-01020				Pollock, Katherine H. 2006	Archaeological Assessment Report Bishop Creek Intake 2 AVM and Pipe Installation Inyo National Forest, Inyo County, California
IN-01043				Hoornbeek, Paul 2013	Cultural Resources Report: Recording Three Department of Water Resources Snow Survey Shelters (CRR No. R2013050401831)
IN-01051				Ugan, Andrew and Jeffrey Rosenthal 2013	Archaeological Survey of 12,457 Acres of the Naval Air Weapons Station China Lake North and South Ranges, Inyo, Kern, and San Bernardino Counties, California
IN-01063		R2016050401996		Brodie, Natalie 2014	Archaeological Survey Report for the Southern California Edison Company Replacement of One Deteriorated Power Pole on the Sabrina 12kV Circuit (TD902324), Inyo National Forest, Inyo County, California
IN-01069		R2015050401956		Morgan, Christopher, Jacqueline Hall, and Roderic McLean 2014	Archaeological Survey Report for the Southern California Edison Company Replacement of Sixteen Deteriorated Power Poles on an Unnamed Circuit (TD712048, TD712051, and TD831459), Inyo National Forest, Inyo County, California

IC NUMBER	NADB NUMBER	USFS NUMBER	BLM REPORT NUMBER	AUTHOR(S)/YEAR	REPORT TITLE
IN-01155	1043463			Mortland, Carol 1974	PRELIMINARY CASE REPORT: No. 2 Control-Casa Diablo 115 kV Transmission Line
		R2016050402000		Beidl, Jacqueline 2015	SCE Sabrina 12kV Deteriorated Pole Replacement Equipment Access (TD432148)
		R2017050402100		Beidl, Jacqueline 2016	Braveheart Trails LLC Cardinal Mine Trail Ford Reroute
		R2018050402243		Beidl, Jacqueline 2018	CalTrans Bishop Creek Camp Road Emergency Culvert Repair
		R2017050402108		Blythe, Ashley A. 2017	Bishop Pass Trail CMLG
		R2011050401644		Duran, Christopher A. 2013	Bishop Creek 1,362 Acre Cultural Resources Survey, Inyo National Forest, Inyo County, California
				Hall, J. and N. Brodie 2016	Archaeological Survey Report for the Southern California Edison Company Grid Reliability and Maintenance Program for the Sabrina 12kV Preventative Maintenance Project, TD1144535, Inyo National Forest, Inyo County, California
		R2016050402069		Hall, Jacqueline and Natalie Brodie 2016	Archaeological Survey Report for the Southern California Edison Company Grid Reliability and Maintenance Program for the Sabrina 12 kV Preventative Maintenance Project, TD1144535, Inyo National Forest, Inyo County, California
		R2017050402192		Hall, Jacqueline and Natalie Brodie 2017	Archaeological Survey Report for the Southern California Edison Company Grid Reliability and Maintenance Program for the Control-Plant 2, Carrier Solutions Fiber Optic Cable Install, SAP 801416782, Inyo National Forest, Inyo County, California
		R2016050401997		Heidelberg, Kurt 2014	Archaeological Survey Report for Southern California Edison's Replacement of Twenty-Eight Deteriorated Power Poles on the Sabrina 12 kV (TD712035, TD712055, TD712061, TD750069 AND TD759728), Control-Silver Peak 55kV (TD681877, TD682236, TD681942 T/L, D682030 T/L, TD712988 T/L,), and Other Unnamed Circuit (TD750072), in Inyo National Forest near Bishop, Inyo County, California
		R2016050402060		Heidelberg, Kurt 2016	Archaeological Survey Report for Southern California Edison's Removal of Fourteen Power Poles, Replacement of One Deteriorated Power Pole, and Installation of Fourteen Power Poles on the Sabrina 12 kV (TD1044613) Circuit, in Inyo National Forest near Aspendell, Inyo County, California
				Heidelberg, Kurt and Gabrielle Duff 2015	Archaeological Survey Report for Southern California Edison's Replacement of Three Deteriorated Power Poles on the Sabrina 12 kV Circuit (TD801675), in Inyo National Forest, Inyo County, California

IC NUMBER	NADB NUMBER	USFS NUMBER	BLM REPORT NUMBER	AUTHOR(S)/YEAR	REPORT TITLE
		R2015050401936		Heidelberg, Kurt and Ronald Norton 2015	Archaeological Survey Report for Southern California Edison's Grid Reliability and Maintenance Project on the Sabrina 12 kV Circuit (TD801675), in Inyo National Forest near Aspendell, Inyo County, California
		R2004050401073(c)		Hilton, Michael R. 2006	Heritage Resources Report: Off-Highway Vehicle (OHV) Route Designation Strategy
		R2007050401261		Hilton, Michael R. 2008	Heritage Resources Report: Rainbow Pack Station Spring Box Replacement
		R2008050401193		Hilton, Michael R. 2009	Heritage Resources Report: UNAVCO Plate Boundary Observation Table Mountain Amendment
		R2000050400807		Hornick, Martin 2000	Bishop Pass Trail Complex - CIP2003
		R2017050402097		Jacobs Engineering Group 2016	South Lake Road Cultural Resources Assessment
		CRR No. R2011050401616		Lee, Mary 2011	Upper Owens Bishop Creek Restoration OHV Planning South Zone
		R2010050401454		Long, Montana and Kari Sprengeler 2009	Class III Cultural Resource Inventory for the Replacement of One Utility Pole on the Control-Morgan-Plant 2 55 kV Line and One Utility Pole on the Control-Silver Peak "A" 55 kV Line, Inyo County, California
		R1987050400423		Mapel, Timothy E. 1987	Archaeological Reconnaissance Report: Buttermilk Meadows Rehabilitation Project
		R1984050400331		Miller, Brian C. 1986	Parcher's Resort
				Millington, Chris, Laura Hoffman, Sara Dietler 2015	Cultural Resources Survey for the Southern California Edison Control-Plant 5-Plant 6, 55 kV Reconductor Project (IO329583), Inyo County, California
				Newcomb, A. 2016a	Cultural Resources Survey Report for Southern California Edison's Proposed Replacement of Six Deteriorated Poles (TD1122646) Located in the White Mountain Ranger District within the Inyo National Forest, Inyo County, California
				Newcomb, Alyssa 2016b	Cultural Resources Survey Report for Southern California Edison's Proposed Replacement of Six Deteriorated Poles (TD1122646) Located in the White Mountain Ranger District within the Inyo National Forest, Inyo County, California
				Newcomb, Alyssa 2016b	Archaeological Survey Report for Southern California Edison's Infrastructure Replacement Project (TD1018871) on the Birchim 12 kV Circuit on Private Land, Inyo County, California

IC NUMBER	NADB NUMBER	USFS NUMBER	BLM REPORT NUMBER	AUTHOR(S)/YEAR	REPORT TITLE
		HRR No. R0211050401616		Nicholas, Colleen 2013	Upper Owens Bishop Creek Phase I Restoration South Zone
		R2015050401952		Parr, Robert E. 2015	Archaeological Site Monitoring Report for the Southern California Edison Company Bishop Creek Hydroelectric Project (FERC Project No. 1394), Inyo National Forest, Inyo County, California
		R2012050401718		Switalski, Hubert and Timothy Kelly 2008	A Heritage Resource Inventory for the Southern California Edison Company's Replacement of 19 Deteriorated Power Poles, Inyo National Forest, Inyo and Mono Counties, California
		R2008050401321		Pollock, Katherine H. 2008b	Archaeological Assessment Report Bishop Creek Hydroelectric Project (FERC Project N. 1394) Southfork Flowline Replacement, Inyo National Forest, Inyo County, California
		R2015050401967		Wisniewski, Peter 2015	FY 15 SZ OHV Ground Operations
		R2015050401990		Wisniewski, Peter and Jacqueline Beidl 2015	Lamarck Trails and Watershed Project
				Millington, Chris and Alyssa Newcomb 2015	Cultural Resources Construction Monitoring Report for the Southern California Edison Bishop Creek Hydroelectric Control-Plant 5-Plant 6 55 kV Reconductor and Equipment Yard Expansion Project, Inyo County, California
				Switalski, Hubert and Sonia Hutmacher 2010	Heritage Resources Inventory Report for the Southern California Edison Company's Replacement of Two Deteriorated Pole Structures on the Control-Morgan-Plant 2 55kV Transmission Line (4770-0355) and Two H-Frame Structures on the Lee Vining-Poole 115kV Transmission Line (4750-1597), Inyo National Forest, Between Bishop and Lee Vining Creek, Inyo and Mono Counties, California
				White, R. M. 1985	Results of the 1984 Field Season, Cultural Resources Survey for the Historic and Archaeological Preservation Plan for Eastern Sierra Hydroelectric Projects in Mono and Inyo Counties, California: Lundy (FERC Project 1390), Lee Vining Creek (FERC Project 1388), Rush Creek (FERC Project 1389), and Bishop Creek (FERC Project 1394)
				White, R. M. 1992	An Evaluation of Effects on Historic Properties Resulting from Replacement of the Bishop Creek Plant No. 5 Flowline, Bishop Creek Hydro Project (FERC Project 1394), Inyo County, California
				White, R. M. 1992	1989-1991 Monitoring of Cultural Resources Associated with the Bishop Creek Hydroelectric Project (FERC Project 1394), Inyo County, California

4.4.3.3 PREVIOUSLY RECORDED ARCHAEOLOGICAL SITES

Archival research conducted to date indicates that there are 52 prehistoric, 30 multicomponent (prehistoric and historic-period), and 76 historic-period previously recorded archaeological sites within the study area. The different types of sites and their NRHP eligibility are listed in Table 4-17. Prehistoric sites primarily include bedrock milling stations, lithic scatters and midden deposits. Multicomponent sites include lithic and debris scatters and historic-period debris (e.g., can scatters, domestic debris scatters). Historic-period sites include historic-period debris and the remains of buildings or structures. The majority of the archaeological sites within the APE and study area have not been evaluated for their eligibility for listing in the NRHP.

TABLE 4-17 PREVIOUSLY RECORDED ARCHAEOLOGICAL RESOURCES WITHIN THE BISHOP CREEK HYDROELECTRIC PROJECT STUDY AREA

PRIMARY NUMBER	TRINOMIAL	USFS NUMBER	BLM NUMBER	SITE TYPE	COMPOSITION OF SITE	NRHP ELIGIBILITY	IN APE	IN STUDY AREA	PROPERTY OWNER
P-14-000469	CA-INY-000468/469/H	05-04-53-000084/85		P/H	Obsidian and Chert Lithics, groundstone, BRM, rock wall, Historic Debris	Eligible		X	USFS
P-14-002529	CA-INY-002529H	05-04-53-000010		H	Remains of Historic Mine and Associated Village	Unknown	X	X	USFS
P-14-002769	CA-INY-002769	05-04-53-000126		P	House Ring, Milling Slick, BRM, Obsidian Lithics	Unknown	X	X	USFS
P-14-002770	CA-INY-002770/H	05-04-53-000127		P/H (Mostly H) Field Check if in APE	Poss. Pit Toilets, Hunting Blind (recent?), Historic Debris	Unknown		X	USFS
P-14-002791	CA-INY-002791			P	Obsidian and Chert Lithics	Unknown		X	Unknown
P-14-003282	CA-INY-003282/H		BLM-C-S1	P/H	Obsidian and Cryptocrystalline Lithics, Historic Debris	Unknown		X	BLM
P-14-003448	CA-INY-003448	05-04-53-000181		P	Obsidian, Chalcedony, and Quartzite Lithics, Flow Line and Valve House Associated with SCE S. Fork Diversion and Reservoir 2	Unknown	X	X	USFS
P-14-003449	CA-INY-003449H	05-04-53-000182		H	Domestic Debris	Unknown	X	X	USFS
P-14-003450	CA-INY-003450	05-04-53-000184		P	Grayware Sherds, Obsidian Lithics	Code 2-Eligible (Record does not indicate if it's actually been tested)	X	X	USFS
P-14-003457	CA-INY-003457/H	05-04-53-000154		P/H	Obsidian Lithics, Granite Mano, Historic Debris	Unknown	X	X	USFS

PRIMARY NUMBER	TRINOMIAL	USFS NUMBER	BLM NUMBER	SITE TYPE	COMPOSITION OF SITE	NRHP ELIGIBILITY	IN APE	IN STUDY AREA	PROPERTY OWNER
P-14-003458	CA-INY-003458	05-04-53-000155		P	Obsidian Lithics, 2 Metates	Code 2-Eligible (Record notes previous testing and recommendation but not sure if concurrence was received)	X	X	USFS
P-14-003459	CA-INY-003459/H	05-04-53-000156		P/H	Obsidian and Chert Lithics, Historic Debris, Hearth (maybe Prehistoric)	Unknown	X	X	USFS
P-14-003460	CA-INY-003460H	05-04-53-000157		H	Donkey Engine, Rock-lined Pit, Penstock Section, Historic Debris	Unknown	X	X	USFS
P-14-003461	CA-INY-003461/H	05-04-53-000158		P/H	BRM, Obsidian Lithics, Mixed Historic Period Debris	Eligible	X	X	USFS
P-14-003462	CA-INY-003462/H	05-04-53-000159		P/H	Obsidian and Basalt Lithics, Post-1950 Cans	Eligible		X	USFS
P-14-003463	CA-INY-003463	05-04-53-000161		P	Obsidian, Chert, Calcedony, MetaV Lithics, Portable Milling Slicks, Rock Wall	Eligible		X	USFS
P-14-003464	CA-INY-003464	05-04-53-000162		P	Obsidian Lithics, Rock Shelter, BRM, Portable Milling Slick	Eligible		X	USFS
P-14-003465	CA-INY-003465	05-04-53-000160		P	Obsidian Flakes	Unknown	X	X	USFS
P-14-003466	CA-INY-003466/H	05-04-53-000163		P/H	Obsidian Flakes, Hexagonal Bead, Historic Debris	Unknown		X	BLM and USFS
P-14-003467	CA-INY-003467/H	05-04-53-000164		P/H	Grinding Slick, Historic Debris	Unknown	X	X	BLM and USFS
P-14-003468	CA-INY-003468/H	05-04-53-000165		P/H	Obsidian and Chert Lithics, Grinding Slicks, Rock Wall, Historic Debris	Unknown	X	X	USFS
P-14-003469	CA-INY-003469H	05-04-53-000167		H	Historic Debris, Remains of Cottage 39	Unknown		X	USFS

PRIMARY NUMBER	TRINOMIAL	USFS NUMBER	BLM NUMBER	SITE TYPE	COMPOSITION OF SITE	NRHP ELIGIBILITY	IN APE	IN STUDY AREA	PROPERTY OWNER
P-14-003470	CA-INY-003470	05-04-53-000168		P	Obsidian and Jasper Lithics (unable to relocate in 2006)	Unknown		X	Unknown
P-14-003471	CA-INY-003471	05-04-53-000169		P	Obsidian and Chert Lithics, Rock Carin, Grinding Slick	Unknown		X	USFS
P-14-003472	CA-INY-003472	05-04-53-000170		P	Obsidian, Basalt, and Chert Lithics	Unknown	X	X	USFS
P-14-003473	CA-INY-003473/H	05-04-53-000172		P/H	Obsidian Lithics, Historic Debris and Features Related to Cashbaugh and Kilpatrick Occupations	Eligible	X	X	USFS
P-14-003474	CA-INY-003474	05-04-53-000173		P	Obsidian Lithics	Unknown	X	X	USFS or BLM
P-14-003475	CA-INY-003475	05-04-53-000175		P	Obsidian Lithics, Grinding Slick	Unknown	X	X	USFS
P-14-003686	CA-INY-003686H	05-04-53-000343		H	Collapsed Mine Shaft and Associated Features	Unknown		X	USFS
P-14-003687	CA-INY-003687H	05-04-53-000344		H	Bishop Crk. PH-1 (failed attempt at construction)	Unknown		X	USFS
P-14-003705	CA-INY-003705			P	Obsidian Lithics, BRM	Unknown		X	
P-14-003936	CA-INY-003936	05-04-53-000530		P	Obsidian Lithics, Mano, Owens Valley Brownware Sherds, BRM	Unknown		X	USFS
P-14-004499	CA-INY-004499	05-04-53-000582		P	Obsidian and Basalt Lithics, Milling Slicks	Unknown	X	X	USFS
P-14-004500	CA-INY-004500	05-04-53-000584		P	Obsidian Lithics	Unknown		X	Unknown
P-14-004501	CA-INY-004501H	05-04-53-001377		H	Non-Diagnostic Historic Trash	Unknown		X	USFS
P-14-004505	CA-INY-004505	05-04-53-000581, 05-05-53-001378		P	Obsidian Lithics	Unknown		X	USFS
P-14-004506	CA-INY-004506	05-04-53-00585		P	Obsidian Lithics	Unknown		X	USFS

PRIMARY NUMBER	TRINOMIAL	USFS NUMBER	BLM NUMBER	SITE TYPE	COMPOSITION OF SITE	NRHP ELIGIBILITY	IN APE	IN STUDY AREA	PROPERTY OWNER
P-14-004507	CA-INY-004507H	05-04-53-00589		H	Historic Trash	Unknown		X	USFS
P-14-004700	CA-INY-004700			P	Obsidian and Basalt Lithics	Unknown		X	Unknown
P-14-004701	CA-INY-004701	05-04-53-001370		P	Obsidian Lithics	Unknown		X	USFS
P-14-004702	CA-INY-004702	05-04-53-001372		P	Obsidian Lithics	Unknown		X	USFS
P-14-004703	CA-INY-004703H	Record notes it's on USFS Land		H	Historic Debris	Unknown		X	Unknown
P-14-004704	CA-INY-004704H	05-04-53-001374		H	Historic Debris	Unknown	X	X	USFS
P-14-004705	CA-INY-004705	Record Notes it's on USFS Land		P	Obsidian Lithics, BRM, Rock Wall, Possible Midden	Unknown		X	USFS
P-14-004706	CA-INY-004706H	05-04-53-001376		H	2- ½ Mile Portions of Bishop Creek Road	Unknown	X	X	USFS
P-14-004723	CA-INY-004723/H	Record Notes it's on USFS Land		P/H	Obsidian Lithics, Historic Debris	Unknown		X	USFS
P-14-004767	CA-INY-004767/H			P/H	Obsidian and Basalt Lithics, Historic Debris	Unknown	X	X	Unknown
P-14-004768	CA-INY-004768H			H	Historic Debris	Unknown		X	Unknown
P-14-004769	CA-INY-004769H			H	Historic Debris	Unknown		X	Unknown
P-14-005185	CA-INY-005185	05-04-53-001383		P	Obsidian Lithics, Bed Rock Mortar, Milling Slick, Rock Ring	Unknown		X	USFS
P-14-005187	CA-INY-005025	05-04-53-001384		P	Obsidian and Quartzite Lithics	Unknown		X	USFS
P-14-005443	CA-INY-005192H			H	Ditch and Historic Debris	Unknown		X	Unknown

PRIMARY NUMBER	TRINOMIAL	USFS NUMBER	BLM NUMBER	SITE TYPE	COMPOSITION OF SITE	NRHP ELIGIBILITY	IN APE	IN STUDY AREA	PROPERTY OWNER
P-14-005444	CA-INY-005193H			H	Concrete and Rock Foundation, Domestic Historic Debris	Unknown		X	Unknown
P-14-005445	CA-INY-005194H			H	Historic Debris	Unknown		X	Unknown
P-14-005448	CA-INY-005197H			H	Historic Debris	Unknown		X	Unknown
P-14-005449	CA-INY-005198H			H	Historic Debris	Unknown		X	Unknown
P-14-005450	CA-INY-005199/H			P/H	Obsidian Flake, Historic Debris	Unknown		X	Unknown
P-14-005451	CA-INY-005200H			H	Historic Debris	Unknown		X	Unknown
P-14-005452	CA-INY-005201H			H	Historic Debris	Unknown		X	Unknown
P-14-005453	CA-INY-005202H			H	Historic Debris	Unknown		X	Unknown
P-14-005454	CA-INY-005203H			H	Historic Debris	Unknown		X	Unknown
P-14-005455	CA-INY-005204H			H	Historic Debris	Unknown		X	Unknown
P-14-005456	CA-INY-005205H			H	Historic Debris	Unknown		X	Unknown
P-14-005457	CA-INY-005026H			H	Historic Debris	Unknown		X	Unknown
P-14-005585	CA-INY-005241/H			P/H	Obsidian Lithics, Milling Station, Milling Equipment, Historic Debris	Unknown		X	Unknown
P-14-005586	CA-INY-005242/H			P/H	Obsidian and Cryptocrystalline Lithics, Historic Debris	Unknown		X	Unknown
P-14-005587	CA-INY-005243			P	Obsidian and Cryptocrystalline Lithics	Unknown		X	Unknown

PRIMARY NUMBER	TRINOMIAL	USFS NUMBER	BLM NUMBER	SITE TYPE	COMPOSITION OF SITE	NRHP ELIGIBILITY	IN APE	IN STUDY AREA	PROPERTY OWNER
P-14-005588	CA-INY-005244			P	Obsidian Lithics	Unknown		X	Unknown
P-14-005590	CA-INY-005246/H			P/H	Obsidian Lithics, Historic Debris	Unknown		X	USFS
P-14-005591	CA-INY-005247			P	Obsidian and Cryptocrystalline Lithics	Unknown		X	Unknown
P-14-005592	CA-INY-005248/H			P/H	Obsidian and Cryptocrystalline Lithics, Groundstone, Bedrock Mortar, Historic Debris	Unknown		X	Unknown
P-14-005596	CA-INY-005252H			H	Historic Debris, Rock Alignment, Road, Ditch	Unknown		X	Unknown
P-14-005597	CA-INY-005253H			H	Historic Debris	Unknown		X	Unknown
P-14-005599	CA-INY-005255/H			P/H	Obsidian, Basalt, and Cryptocrystalline Lithics, Midden, Milling Equipment, Historic Debris	Unknown		X	Unknown
P-14-005661	CA-INY-005308	05-04-53-001379		P	Obsidian Lithics, Pictograph	Unknown		X	USFS
P-14-006761	CA-INY-005788	05-04-53-001449		P	Obsidian Lithics, BRM	Unknown		X	USFS
P-14-006901	CA-INY-005789	05-04-53-001450		P	Obsidian Lithics, Bedrock Milling Station	Unknown		X	USFS
P-14-006940	CA-INY-005924H	05-04-53-001502		H	Milling and Mining Related Debris and Buildings	Unknown		X	USFS
P-14-007088	CA-INY-006023H			H	Owens River Canal (Abandoned)	Undetermined		X	Unknown
P-14-007089	CA-INY-006024H			H	Road F55	Unknown		X	Unknown
P-14-007090	CA-INY-006025H			H	Road F57	Unknown		X	
P-14-007416	CA-INY-006292H	05-04-53-007721		H	Mining Debris, Cabins, Mining Related Structures	Unknown		X	USFS

PRIMARY NUMBER	TRINOMIAL	USFS NUMBER	BLM NUMBER	SITE TYPE	COMPOSITION OF SITE	NRHP ELIGIBILITY	IN APE	IN STUDY AREA	PROPERTY OWNER
P-14-007849	CA-INY-006510H			H	Historic Domestic Debris	Unknown		X	Unknown
P-14-007850				H	Historic Debris	Unknown		X	Unknown
P-14-008304	CA-INY-006615	05-04-53-001778		P?	Three Rock Rings	Undetermined		X	USFS
P-14-008317	CA-INY-006626	05-04-53-001782		P	Obsidian Lithics	Undetermined		X	USFS
P-14-008318	CA-INY-006627	05-04-53-001783		P	Obsidian Lithics	Undetermined		X	USFS
P-14-008326	CA-INY-006634	05-04-53-001791		P	Obsidian Lithics	Undetermined		X	USFS
P-14-008328	CA-INY-006637	05-04-53-001793		P	Lithics and Rock Ring	Undetermined		X	USFS
P-14-008329	CA-INY-006638	05-04-53-001794		P	Obsidian and Basalt Lithics	Undetermined		X	USFS
P-14-008331	CA-INY-006640H	05-04-53-001797		H	Historic Mining Features	Undetermined		X	USFS
P-14-008600	CA-INY-006758H	05-04-53-001900		H	Historic Fire Pits	Unknown		X	USFS
P-14-008601	CA-INY-006759	05-04-53-001901		P	Obsidian Lithics	Unknown		X	USFS
P-14-008602	CA-INY-006760H	05-04-53-001902		H	Historic Camp and Arboroglyphs	Unknown		X	USFS
P-14-008603	CA-INY-006761H	05-04-53-001903		H	Historic Debris	Unknown		X	USFS
P-14-008604	CA-INY-006762	05-04-53-001904		P	Lithics, Milling Equipment, Milling Slick	Unknown		X	USFS
P-14-009029	CA-INY-007095H	05-04-53-001993		H	Historic Debris	Unknown		X	USFS
P-14-009030	CA-INY-007096H	05-04-53-002024		H	Historic Debris	Unknown		X	USFS
P-14-0010146				H	Rock Structure and Historic Debris	Unknown		X	Unknown

PRIMARY NUMBER	TRINOMIAL	USFS NUMBER	BLM NUMBER	SITE TYPE	COMPOSITION OF SITE	NRHP ELIGIBILITY	IN APE	IN STUDY AREA	PROPERTY OWNER
P-14-010525		05-04-53-000176		H	Remains of First Bishop Creek PH	Unknown		X	USFS
P-14-010526		05-04-53-000177		H	Remains of Plant 3 Cottages	Unknown	X	X	USFS
P-14-010527		05-04-53-000178		H	Remains of Plant 3 Apartments	Unknown	X	X	USFS
P-14-010529		05-04-53-000171		H	Rock Terraces for Chicken Coops associated with Cottage 4 of Unknown Power Plant	Unknown	X	X	USFS
P-14-010534	CA-INY-008001	05-04-53-002308		P	Obsidian Lithics	Unknown	X	X	USFS
P-14-010606	CA-INY-008063H	05-04-53-002226		H	Domestic Debris	Unknown		X	USFS
P-14-011340	CA-INY-008770	05-04-23-002210		P	Milling Station, Mano	Unknown		X	USFS
P-14-011451		05-04-53-002211		P	Rock Shelter, Pictographs, Milling, Lithic Scatter	Unknown		X	USFS
P-14-011452		05-04-53-002213		H	Rock Alignment (Road?)	Unknown		X	USFS
P-14-011718	CA-INY-009014H			H	Historic Debris	Unknown		X	Unknown
P-14-011719	CA-INY-009015H			H	Historic Debris, Irrigation Ditch	Unknown		X	Unknown
P-14-011722	CA-INY-009016H	05-04-53-002349		H	Historic Debris	Unknown			USFS
P-14-011723	CA-INY-009017H	05-04-53-002346		H	Domestic Debris	Unknown		X	USFS
P-14-011724	CA-INY-009018H	05-04-53-002344		H	Historic Debris	Unknown	X	X	USFS
P-14-011725	CA-INY-009019	05-04-53-002293		H	Domestic Debris	Unknown	X	X	USFS
P-14-012257				H	Ed Powers Road	Not Eligible		X	Unknown
P-14-012258	CA-INY-009423H			H	Historic Debris	Unknown		X	Unknown

PRIMARY NUMBER	TRINOMIAL	USFS NUMBER	BLM NUMBER	SITE TYPE	COMPOSITION OF SITE	NRHP ELIGIBILITY	IN APE	IN STUDY AREA	PROPERTY OWNER
P-14-012259	CA-INY-009424H			H	Historic Debris	Unknown		X	Unknown
P-14-012260	CA-INY-009425H			H	Historic Debris	Unknown		X	Unknown
P-14-012269	CA-INY-009434H			H	Historic Debris	Unknown		X	Unknown
P-14-012270	CA-INY-009435H			H	Historic Debris	Unknown		X	Unknown
P-14-012707	CA-INY-009620	05-04-53-002270		H	Concrete Pad, Can Scatter	Unknown		X	USFS
P-14-012777	CA-INY-009677/H			P/H	Obsidian Lithics, Historic Debris	Unknown		X	Unknown
P-14-012778	CA-INY-009678/H			P/H	Obsidian Lithics, Water Conveyance, Historic Debris	Unknown	X	X	Unknown
P-14-012779	CA-INY-009679H			H	Historic Debris	Unknown	X	X	Unknown
P-14-012780	CA-INY-009680H			H	Historic Debris	Unknown	X	X	Unknown
P-14-012781	CA-INY-009681/H			P/H	Obsidian Ligthics, Historic Debris	Unknown		X	Unknown
P-14-012782	CA-INY-009682/H			P/H	Obsidian Ligthics, Historic Debris	Unknown		X	Unknown
P-14-012783	CA-INY-009683H			H	Historic Debris	Unknown		X	Unknown
P-14-012784	CA-INY-009684H			H	Historic Debris	Unknown		X	Unknown
P-14-012785	CA-INY-009685/H			P/H	Obsidian Lithics, Historic Debris	Unknown		X	Unknown
P-14-012790	CA-INY-009689H			H	Historic Debris	Unknown		X	Unknown
P-14-012791	CA-INY-009690/H			P/H	Piaute Ditch, Historic Ditch	Unknown	X	X	Unknown
P-14-012828	CA-INY-009722H			H	Historic Debris	Unknown		X	BLM

PRIMARY NUMBER	TRINOMIAL	USFS NUMBER	BLM NUMBER	SITE TYPE	COMPOSITION OF SITE	NRHP ELIGIBILITY	IN APE	IN STUDY AREA	PROPERTY OWNER
P-14-012850	CA-INY-009741	Record Notes on USFS Land		H	Domestic Debris	Unknown		X	USFS
P-14-013136	CA-INY-009987	05-04-53-002309		P	Obsidian Lithics	Unknown		X	USFS
	CA-INY-001001	05-04-53-000157			Need Record		X	X	USFS
	CA-INY-004503	05-04-53-000587		P	Obsidian Lithics	Unknown			USFS
	CA-INY-002528	05-04-53-000122		P	Obsidian Lithics	Unknown	X	X	USFS
	CA-INY-005245				Need Record	Unknown	X	X	USFS
		05-04-53-000126		P	House Ring, Bedrock Mortar, Grinding Slick, Obsidian Lithics	Unknown		X	USFS
		05-04-53-000174		H	Clay Pigeon Fragments, Shooting Blind	Unknown		X	USFS
		05-04-03-000179			Need Record			X	USFS
		05-04-53-000183		H	Remains of Watchman's Cabin Associated with Bishop Creek Hydroelectric Project	Unknown		X	USFS
		05-04-53-000345		H	3 Concrete and Stone Features, Water Pipe	Unknown		X	USFS
		05-04-53-001371		P/H	Obsidian Lithics, Historic Debris	Unknown			USFS
		05-04-53-001373		H	Historic Debris	Unknown		X	USFS
		05-04-53-001374		H	Historic Debris	Unknown		X	USFS
		05-04-54-001375		P	Milling Feature, Unmortared Rock Wall, Possible Midden, Obsidian Lithics	Unknown		X	USFS
		05-04-53-001376		H	Two 1/2 Mile Segments of Bishop Creek Road	Unknown		X	USFS

PRIMARY NUMBER	TRINOMIAL	USFS NUMBER	BLM NUMBER	SITE TYPE	COMPOSITION OF SITE	NRHP ELIGIBILITY	IN APE	IN STUDY AREA	PROPERTY OWNER
		05-04-53-001450		P	Obsidian Lithics, Portable Milling Feature	Unknown		X	USFS
		05-04-53-001723			Need Record		X	X	USFS
		05-04-53-001755		P	Obsidian Lithics and Tools	Unknown		X	USFS
		05-04-53-001756		P	Obsidian and Cryptocrystalline Lithics, Obsidian Tools	Unknown		X	USFS
		05-04-53-001757		P/H	Obsidian Flakes and Tools, Granite Handstone, Historic Debris	Unknown		X	USFS
		05-04-53-001758		P/H	Obsidian Flakes, Midden, Groundstone, Historic Debris	Unknown		X	USFS
		05-04-53-001759		P	Obsidian Flakes and Tools	Unknown		X	USFS
		05-04-53-001760		P/H	Obsidian and Cryptocrystalline Flakes, Bedrock Milling Station, Groundstone, Historic Debris	Unknown		X	USFS
		05-04-53-002153		P	Obsidian Lithic Scatter	Unknown		X	USFS
		05-04-53-002171		H	Rock Ring Structural Base, Historic Debris	Unknown	X	X	USFS
		05-04-53-002279			Need Record	Unknown	X		USFS
		05-04-53-002280			Need Record	Unknown		X	USFS
		05-04-03-002281			Need Record	Unknown	X		USFS
		05-04-03-002282			Need Record	Unknown	X		USFS
		05-04-53-002292		H	Collapsed Retaining Wall	Unknown	X		USFS

4.4.3.4 PREVIOUSLY RECORDED BUILT ENVIRONMENT RESOURCES

4.4.3.4.1 HYDROELECTRIC RELATED FACILITIES

Bishop Creek Hydroelectric Project

During the previous relicensing effort, SCE evaluated the Bishop Creek Hydroelectric Project (BCHS) for its NRHP eligibility. The BCHS consists of five powerhouses each containing a set of independent, high-head, impulse water wheel, and electrical power-generating sub-systems established at various elevations along Bishop Creek on the eastern slope of the Sierra Nevadas. The BCHS is significant for its position in the expansion of hydroelectric generation technology, its role in the development of eastern California, and the development of transmission electrical power across long distances. The Project is intact and is an early example of a high-head, impulse water wheel, and high-voltage electric generation project. The Project was determined eligible (by consensus) for listing in the NRHP under Criteria A and C, with a period of significance of 1905 to 1938 (OHP Letter dated September 7, 1988). The historic district is recorded as P-14-004812, with 68 contributing elements. The known historic properties and previously determined not eligible resources within the BCHS are listed in Table 4-18.

TABLE 4-18 BISHOP CREEK HYDROELECTRIC PROJECT HISTORIC DISTRICT

PRIMARY NUMBER	NRHP STATUS	RELATED PLANT	DESCRIPTION
14-004825	Eligible Historic District	Hydroelectric Project	Bishop Creek Hydroelectric Project
14-005741	Contributing Element	Birch Creek East	Flowline
14-005742	Contributing Element	Birch Creek East	Intake, Diversion
14-005743	Contributing Element	Birch Creek West	Flowline
14-005744	Contributing Element	Birch Creek West	Intake, Diversion
14-005750	Contributing Element	Green Creek Diversion	Flowline
14-005751	Contributing Element	Green Creek Diversion	Intake, Diversion
14-005753	Contributing Element	Lake Sabrina	Dam
14-005754	Contributing Element	Lake Sabrina	Weir, Gauging Station
14-005755	Contributing Element	Lake Sabrina	Valve House: Building 103
14-005756	Contributing Element	Longley Lake	Dam
14-005757	Contributing Element	McGee Creek	Flowline
14-005758	Contributing Element	McGee Creek	Intake, Diversion

PRIMARY NUMBER	NRHP STATUS	RELATED PLANT	DESCRIPTION
14-005800	Contributing Element	South Lake	Dam
14-005798	Contributing Element	Southfork Diversion	Dam, Intake, Flowline
14-005799	Contributing Element	Southfork Diversion	Weir Lake Flow Monitoring Dam
14-005752	Contributing Element	Plant 2	Intake No. 2
14-005760	Contributing Element	Plant 2	Penstock No. 2
14-005761	Contributing Element	Plant 2	Flowline No. 2
14-005768	Contributing Element	Plant 2	Powerhouse No. 2
14-005769	Contributing Element	Plant 2	Transformer House
14-005777	Contributing Element	Plant 2	Shed: Building 107
14-005736	Contributing Element	Plant 3	Flowline No. 3
14-005762	Contributing Element	Plant 3	Penstock No. 3
14-005767	Contributing Element	Plant 3	Intake No. 3
14-005772	Contributing Element	Plant 3	Powerhouse No. 3
14-005773	Contributing Element	Plant 3	Battery House
14-005735	Contributing Element	Plant 4	Cottage: Building 102
14-005737	Contributing Element	Plant 4	Flowline No. 4
14-005759	Contributing Element	Plant 4	Cottage: Building 103
14-005763	Contributing Element	Plant 4	Penstock No. 1 and 2
14-005770	Contributing Element	Plant 4	Intake No. 4
14-005771	Contributing Element	Plant 4	Steam Gaging Station
14-005774	Contributing Element	Plant 4	Cottage: Building 114
14-005775	Contributing Element	Plant 4	Cottage: Building 115
14-005778	Contributing Element	Plant 4	Cottage: Building 117
14-005779	Contributing Element	Plant 4	Cottage: Building 116
14-005779	Contributing Element	Plant 4	Cottage: Building 121
14-005780	Contributing Element	Plant 4	Cottage: Building 122
14-005781	Contributing Element	Plant 4	Vault: Building 125
14-005782	Contributing Element	Plant 4	Meter House: Building 126
14-005783	Contributing Element	Plant 4	Valve House: Building 127
14-005784	Contributing Element	Plant 4	Fire House: Building 128
14-005785	Contributing Element	Plant 4	Garage: Building 130
14-005786	Contributing Element	Plant 4	Shed: Building 135
14-005787	Contributing Element	Plant 4	Landscape Feature
14-005789	Contributing Element	Plant 4	Powerhouse No. 4
14-005790	Contributing Element	Plant 4	Cottage: Building 104

PRIMARY NUMBER	NRHP STATUS	RELATED PLANT	DESCRIPTION
14-005791	Contributing Element	Plant 4	Cottage: Building 105
14-005792	Contributing Element	Plant 4	Cottage: Building 106
14-005793	Contributing Element	Plant 4	Recreation Hall: Building 109
14-005794	Contributing Element	Plant 4	Cottage: Building 113
14-005739	Contributing Element	Plant 5	Powerhouse No. 5
14-005764	Contributing Element	Plant 5	Penstock No. 5
14-005788	Contributing Element	Plant 5	Intake No. 5
14-005801	Contributing Element	Plant 5	Flowline No. 5
14-005738	Contributing Element	Plant 6	Transformer Building between Powerhouse No. 5 and 6
14-005740	Contributing Element	Plant 6	Flowline No. 6
14-005765	Contributing Element	Plant 6	Penstock No. 6
14-005766	Contributing Element	Plant 6	Intake No. 6
14-005795	Contributing Element	Plant 6	Powerhouse No. 6
14-005796	Contributing Element	Plant 6	Cahbaugh Resident
14-005797	Contributing Element	Plant 6	Utility Building
14-005734	Contributing Element	Control Station	Cottage: Building 102
14-005746	Contributing Element	Control Station	Cottage: Building 103
14-005747	Contributing Element	Control Station	Control Station: Building 101
14-005747	Contributing Element	Control Station	Cottage: Building 106
14-005748	Contributing Element	Control Station	Cottage: Building 108
14-005749	Contributing Element	Control Station	Cottage: Building 111

Hydroelectric-related resources not included in the historic district have been recorded in other surveys (Table 4-19). For example, the valve house and flow line recorded in 2010 (P-14-003448) and original intake dam for the Nevada Power, Mining, and Milling Company (now SCE Plant 4) recorded in 1986 (P-14-010528). Additional such resources likely exist throughout the APE, and the proposed study will inventory all such resources and evaluate whether they should be added as contributing elements to the historic district, are individually eligible, or are not eligible.

4.4.3.4.2 RECREATIONAL FACILITIES

Also located within the APE, mostly along the creek and impoundments related to the BCHS, are a number of historic-period recreation-related facilities (Table 4-19). Bishop Pack Outfitters (P-14-013394) and Rainbow Pack Outfitters (USFS 05-04-53-01843[17]), for example, were both recorded in 2004 as part of a larger thematic evaluation of pack stations operating within the INF and Sierra National Forests in the Eastern Sierra (Woolfenden and Conners 2007). Other recreation-related resources recorded in the APE/study area include residences/cabins associated with the Utter Tract (USFS 05-04-53-01727), South Fork Bishop Tract (USFS 05-04-53-01726, eligible), and Lake Sabrina Tract (USFS 05-04-53-01723), all of which were recorded as part of a larger study of recreational tracts performed in 2003 by Mountain Heritage Associates.[18] Additionally, docks and boat houses, concessions, restrooms, campgrounds, and associated buildings and structures abound within the APE. All will need to be inventoried and evaluated during the study.

4.4.3.4.3 MINING RESOURCES

In addition to the BCHS and recreational facilities within the APE are a number of mining-related buildings and structures (both in ruins and extant) (Table 4-19). Located near Camp Sabrina, the Wilshire-Bishop Creek (Cardinal) Gold Mine was recorded as archaeological site CA-INY-25294 in 1982 (P-14-002529). Mostly in ruins at that time, the site record noted the presence of a number of buildings and structures associated with the gold-mining operation that dated from 1906 to 1938. Included in the inventory were foundations, buildings (in various stages of disintegration), a mill, a headframe, adits, tunnels, a possible flume and flume box, piping, a dam, roads and bridges, and various dumps and artifact scatters. Commonly referred to at the time of recordation as the Cardinal Resort, the site was described as being in fair condition and listed as "threatened . . . possibly by SCE Project." Another mining site located within the study area is the Whitecaps Mill Site (P-14-006940) recorded in 2000.

[17] Note: USFS numbers or trinomials are given when primary number is unknown.
[18] We have not been able to definitively map each of these resources within the APE but know they are within the study area.

TABLE 4-19 PREVIOUSLY RECORDED ARCHITECTURAL RESOURCES WITHIN THE BISHOP CREEK HYDROELECTRIC PROJECT STUDY AREA

PRIMARY NUMBER	TRINOMIAL	USFS NUMBER	BLM NUMBER	HISTORIC NAME / CURRENT NAME (IF DIFFERENT)	RESOURCE TYPE	DATE OF CONSTRUCTION/ PERIOD OF SIGNIFICANCE	NRHP ELIGIBILITY	IN APE	IN STUDY AREA	PROPERTY OWNER
P-14-004825 (and other associated P numbers)		05-04-53-002311		BCHS Historic District	See Table 4-18 for list of contributing resources.	1905-1938	Eligible	X	X	SCE
P-14-010528		05-04-53-000179		Nevada Power, Mining & Milling Company Dam	Concrete and timber dam	1905	Unknown	X	X	?
P-14-003448	CA-INY-003448/H	05-04-53-000181			Flow Line and Valve House Associated with SCE S. Fork Diversion and Reservoir 2		Unknown	X	X	USFS
P-14-002529	CA-INY-002529/H	05-04-53-000010		Wilshire-Bishop Creek (Cardinal) Gold Mine	Remains of gold mine and associated buildings and structures		Unknown	X	X	USFS
P-14-006940	CA-INY-005924/H	05-04-53-001502		Whitecaps Mill Site	Milling and Mining Related Debris and Buildings	c. 1916-1918 through 1960-1970	Unknown	?	X	USFS
		05-04-53-001727		Utter Recreation Residence Tract	Residential cabins (4) and associated structures	1923-1959	Unknown	X	X	USFS
		05-04-53-001723		Lake Sabrina Recreation Residence Tract	Residential cabins (8) and associated structures	1923-1959	Unknown	X	X	USFS
		05-04-53-001726		South Fork Bishop Tract	Residential cabins (10) and associated structures	1923-1959	Unknown	X	X	USFS
P-14-13394		05-04-53-01842		Bishop Pack Outfitters (North Lake)	Ancillary buildings, commercial building, gates/fences+F36	POS for thematic study is 1920-1941 (one building in this complex was original schoolhouse from Cardinal Mine, c. 1906)	Unknown	?	X	USFS

PRIMARY NUMBER	TRINOMIAL	USFS NUMBER	BLM NUMBER	HISTORIC NAME / CURRENT NAME (IF DIFFERENT)	RESOURCE TYPE	DATE OF CONSTRUCTION/ PERIOD OF SIGNIFICANCE	NRHP ELIGIBILITY	IN APE	IN STUDY AREA	PROPERTY OWNER
		05-04-53-01843		Rainbow Pack Outfitters	Ancillary buildings, commercial building, gates/fences	POS for thematic study is 1920-1941 / Rainbow Pack Station built c. 1924	Unknown	?	X	USFS

4.4.3.5 PREVIOUSLY RECORDED NONNATIVE TRADITIONAL RESOURCES

No nonnative traditional resources have been identified within the APE. Nonnative resources anticipated to be identified within the APE are likely to be related to Basque settlement and sheep herding, as well as recreation including pack stations.

4.4.4 STUDY AREA

As provided for in 18 CFR § 5.5(e), SCE, under separate cover, requested FERC to designate SCE as FERC's nonfederal representatives for purposes of initiating consultation under Section 106 of the NHPA and the implementing regulations of 36 CFR § 800.2(c)(4). Under 36 CFR 800.16(d), the APE is defined as "the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historical properties, if any such properties exist." For archaeological, built environment, and non-native TCR's, the Project boundary will serve as the APE; however, the APE may be amended based on resource agency and or Tribal consultation.

It is possible that current recreation, road, or other studies implemented as part of the relicensing process may identify areas outside the Project boundary that have potential to affect historic properties. It is possible that SCE may propose Project improvements that are outside the Project boundary. If such areas are identified by these studies or as Project improvements, SCE will expand the APE in accordance with 36 CFR 800.4(a)(1) in consultation with the INF and BLM, as appropriate, the California Office of Historic Preservation (OHP), other appropriate agencies, Tribes, and interested parties. Appropriate archaeological, built environment, and non-native TCR studies inventories will be completed as part of this study if the APE is expanded.

The study area encompasses a 1-mile buffer around the APE. The background research will include the study area to facilitate our knowledge about past settlement and subsistence practices, as well as past land use. This information will provide insight as to the types of archaeological resources, built environment resources, and non-native TCRs over 50 years of age may be present in the APE and will help formulate a sound strategy for conducting fieldwork.

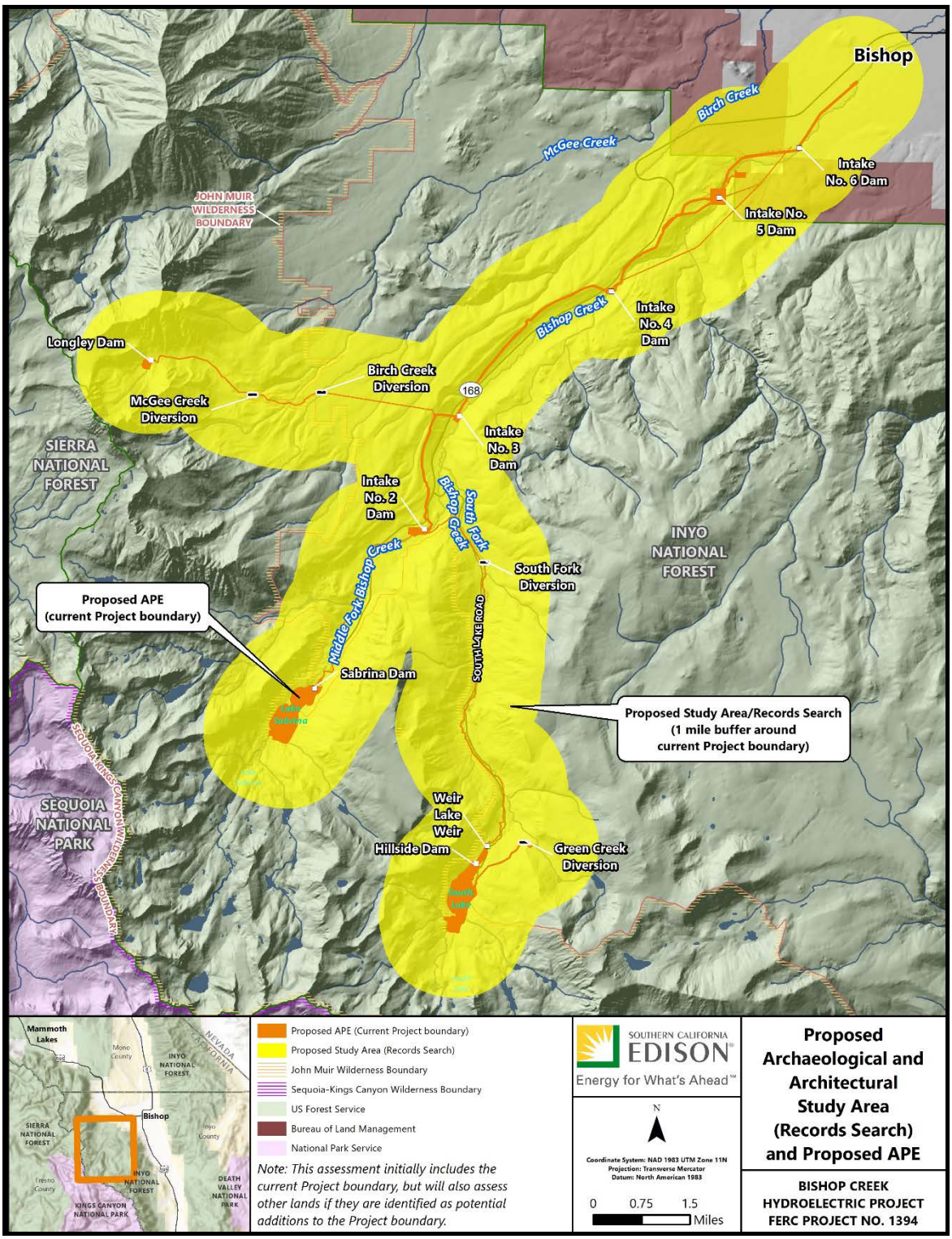

FIGURE 4-4 PROPOSED ARCHAEOLOGICAL AND ARCHITECTURAL RESOURCES STUDY AREA (RECORDS SEARCH) AND PROPOSED APE

4.4.5 METHODS

4.4.5.1 GENERAL CONCEPTS

- Personal safety is an important consideration of each fieldwork team. If SCE determines the information cannot be collected in a safe manner, SCE will notify FERC and relicensing participants as soon as possible via email to discuss alternative approaches to perform the study.

- SCE shall obtain permission to access private property where needed well in advance of performance of the study. If access is not granted, or if it is not feasible or safe, SCE will notify FERC and relicensing participants as soon as possible via email to discuss alternative approaches to perform the study.

- Field crews may make minor modifications to the study proposal in the field to accommodate actual field conditions and unforeseen problems. When modifications are made, the SCE field crew will follow the protocols in this Study Plan. If minor modifications are made SCE will notify FERC and relicensing participants as soon as possible via email to discuss alternative approaches to perform the study.

- SCE's performance of the study does not presume SCE is responsible as in whole or in part for resource management measures that may arise from that study.

- The estimated level of effort and cost is not a firm commitment by SCE to expend all funds. If the study costs more, SCE is committed to completing the study. If the study costs less, SCE is not committed to expending the remaining funds on other relicensing studies or resource management measures.

- SCE shall treat all information regarding the specific locations of archaeological sites as privileged and confidential. The GPS coordinates and maps showing the locations of such resources will not be made available to any relicensing participant other than the INF, BLM, FERC, SHPO, the Eastern California Information Center (ECIC) and participating Tribes.

4.4.5.2 STUDY METHODS

The following subsections describe the proposed methods.

4.4.5.2.1 ARCHIVAL RESEARCH

As needed during implementation of the studies, archival research will be conducted at the repositories listed below to obtain additional information specific to the prehistory, ethnography, and history of the Project area, the hydroelectric Project in whole, and its individual features. This may include contacting SCE employees, as appropriate, to gather feature-specific information. The results of the archival research will serve as the basis for preparing the

prehistoric and historic contexts against which archaeological and architectural resources may be evaluated. Historical photographs located during the archival research will be cited in the text as figures and provided in a separate appendix unless they are subject to copyright laws. Previous NRHP evaluations of Project features will be used as much as possible (although, if previous studies are dated or lacking in necessary detail, additional, site-specific research may be required on an as-needed basis during the studies). Places to be contacted or visited shall include:

- USFS, INF Ranger District
- U.S. BLM, Bishop Field Office
- Native American Heritage Commission
- Eastern Information Center, University of California, Riverside
- Bishop Creek Paiute, Cultural Center
- Southern California Edison, Rosemead Office
- Huntington Library, SCE Collection: Records, Documents, and Photos
- Other online repositories as applicable

4.4.5.2.2 ARCHAEOLOGICAL INVENTORY

Based on the existing data described above, FERC is required to make a reasonable and good-faith effort to identify historic properties that may be affected by the Project. As described in 36 CFR § 800.4(b)(1), this may be accomplished through sample field investigations and/or field surveys that are implemented in accordance with the Secretary of the Interior's Standards and Guidelines for Identification (NPS 1983). FERC is required to consider any other applicable professional standards and Tribal, state, or local laws or procedures to complete the identification of historic properties.

To assist FERC in meeting its compliance obligations, and to develop appropriate management measures for historic properties identified within the APE, an archaeological inventory will be performed to verify locations of previously recorded archaeological resources and to examine all accessible lands not previously surveyed or that need to be resurveyed to meet current professional standards.

Areas within the APE that cannot be accessed in a safe manner (e.g., locations with dense vegetation or unsafe slopes) will not be included within the survey or recording of archaeological

resources; these areas will be identified in the resulting survey report and an explanation for survey exclusion will be provided.

The field survey will be supervised by one or more qualified, professional archaeologists (i.e., individuals who meet the Secretary of the Interior's Professional Qualifications for Archaeology) that will participate in all field work. During the survey, archaeologists will walk parallel transects spaced at no more than 65.6-feet intervals (20-meters) as vegetation and terrain allows. The purpose of the field survey is to: 1) examine lands which have not been previously surveyed; 2) examine lands previously surveyed but where the field strategy is unknown; and 3) examine lands previously surveyed but for which the field strategy does not meet current professional standards, as defined in the Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation (NPS 1983). If conditions allow, lands will be examined that are typically inundated by Project reservoirs, but which may become accessible during the survey season because of normal reservoir drawdowns.

Locations of previously recorded archaeological sites will be verified, and their site records will be updated only if the existing documentation does not meet current standards for recording, or if the condition and/or integrity of the property has changed since its previous recording. The archaeologists will determine if sketch maps for previously documented sites require revision to more accurately describe current site conditions. Newly discovered archaeological resources, including isolated finds, will be fully documented following the recordation procedures outlined in Instructions for Recording Historical Resources (OHP 1995), which utilizes CDPR forms DPR 523 A-L. A sketch map for each site recorded or an updated site will be drawn to-scale and the property photographed. Field personnel will use a GPS receiver to document the location of archaeological resources (including isolates) recorded during the survey, which will be plotted onto the appropriate USGS 7.5-minute topographic quadrangle using the Universal Transverse Mercator (UTM) coordinate system. GPS data collection will adhere to the INF or BLM specifications for accuracy and site-specific procedures where applicable. Additionally, the areas examined will be plotted onto the appropriate USGS 7.5-minute topographic quadrangle for comparison with previous survey coverage maps.

Archaeological surveys that occur on INF and BLM lands will require valid Archaeological Resource Protection Act (ARPA) permits. SCE, or, as appropriate, their consultants will obtain all required permits prior to beginning field work. SCE will notify the INF and BLM when field work is scheduled to begin. All artifacts encountered during the field survey will be left in place; no artifacts will be collected during the field survey.

4.4.5.2.3 DISCOVERY AND TREATMENT OF HUMAN REMAINS

FEDERALLY MANAGED LAND

Should human skeletal materials, burials, and/or associated funerary objects be identified during the survey or other phases of the Project or prior to license issuance on federal land, at the moment of discovery, all work in the immediate area will cease and the location of the find will be secured. Personnel responsible for the discovery will notify the SCE Cultural Resources Specialist who in-turn will notify the appropriate federal land management agency's archaeologist and law enforcement officer. The remains will be treated in accordance with protocols of the appropriate land management agency.

PRIVATE OR STATE LAND

Should human skeletal materials, burials and/or associated funerary objects be identified during the survey or other phases of the Project or prior to license issuance, they will be treated in accordance with California Health and Safety Code (CHSC) Section 7050.5(b). At the moment of discovery, all work in the immediate area will cease and the location of the find will be secured. Personnel responsible for the discovery will notify the SCE Cultural Resources Specialist who in-turn, given that the skeletal materials are verified as human, will contact the County Coroner and a qualified archaeologist will be secured to evaluate the find to determine, in consultation with the coroner, if the remains are or are not Native American. The skeletal remains will be treated following CHSC Section 7050.5. If the human skeletal remains are Native American and are located on INF or BLM land, FERC and SCE's cultural resources specialist shall coordinate with the appropriate agency to comply with the Native American Graves Protection and Repatriation Act (NAGPRA) pursuant to 25 United States Code (U.S.C.) 3001 et seq.

4.4.5.2.4 ARCHITECTURAL INVENTORY

Field inspection, documentation and subsequent NRHP evaluation (see below) of the entire Project area (APE) will be undertaken by individuals meeting the Secretary of the Interior Professional Qualifications for Architectural History. The architectural historian will record or re-record (as appropriate, to meet current CDPR standards) each individual building or structure within the APE, including those that do not yet meet the age requirement for evaluation for the relicensing effort (which has been determined in consultation with the USFS to be any building or structure that will be 45 years old as of 2024). In addition to the hydroelectric-related resources, the architectural historian be specifically looking for buildings, structures and objects associated with mining and recreation as well as any additional resources found during survey.

Fieldwork will include digital color photography of all resources and the production of sketch maps of individual features that show the relationship of buildings and structures within each complex that may be associated with them (e.g., an operational hydroelectric facility or a campground within the APE). When possible, GPS points will be taken of each resource that will then be plotted onto maps to create a comprehensive inventory of historic resources within the APE.

4.4.5.2.5 NONNATIVE TRADITIONAL RESOURCES INVENTORY

Based on the existing data described above, FERC is required to make a reasonable and good-faith effort to identify historic properties that may be affected by the Project. As described in 36 CFR § 800.4(b)(1), this may be accomplished through sample field investigations and/or field surveys that are implemented in accordance with the Secretary of the Interior's Standards and Guidelines for Identification (NPS 1983). FERC is required to consider any other applicable professional standards and Tribal, state or local laws or procedures to complete the identification of historic properties.

To assist FERC in meeting its compliance obligations, and to develop appropriate management measures for historic properties identified within the APE, a nonnative traditional resources inventory will be performed to identify their presence.

The inventory will be coordinated with the archaeological, architectural and Native American Traditional Resource studies. Supervision will be a joint effort by one or more qualified, professional archaeologists or architectural historians (i.e., individuals who meet the Secretary of the Interior's Professional Qualifications for Archaeology or Architectural History) that will participate in all research, public outreach and field work.

If a potential resource is identified during research, public outreach, and/or field work, oral interviews and/or field verification will be conducted as appropriate. Resource locations will be verified, and they will be fully documented following the U.S. National Park Service (NPS) Guidelines for Recording TCPs. The locations of all non-native TCRs identified during the survey will be entered into a GPS receiver to document the location, which will be plotted onto the appropriate USGS 7.5-minute topographic quadrangle using the UTM coordinate system. GPS data collection will adhere to the INF or BLM specifications for accuracy and site-specific procedures where applicable.

4.4.5.2.6 NATIONAL REGISTER OF HISTORIC PLACES EVALUATION

SCE shall utilize the results of the inventories to prepare, in collaboration with the INF, BLM, Tribes and other relicensing participants, a plan to evaluate the eligibility of potential historic properties (in this case, archaeological sites, built environment resources, and nonnative TCRs) for the NRHP. The Study Plan will include an assessment of past, present and reasonably foreseeable Project effects on potential historic properties and detail the methods of evaluation to be implemented. The evaluation plan will be provided to the INF, BLM, Tribes and other relicensing participants for review 30 days prior to submitting to OHP.

National Register Criteria for Evaluation

The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association and:

a. are associated with events that have made a significant contribution to the broad pattern of American history;
b. are associated with the lives of persons significant in America's past;

c. that embody the distinctive characteristics of a type, period or method of construction or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; and

d. that have yielded, or may be likely to yield, information important to prehistory or history (NPS 1997).

4.4.5.2.7 REPORTING AND HISTORIC PROPERTIES MANAGEMENT PLAN

The results of the Study Plan will be reported in Exhibit E of the License Application, which will include a summary of the information and findings of the Study Plan. Figures and other pertinent data supporting the summary in Exhibit E will be appended to the License Application. The archaeological records and other sensitive information will be included in a confidential appendix withheld from public disclosure, in accordance with Section 304 (16 U.S.C. 4702-3) of the NHPA.

SCE anticipates FERC will enter into a programmatic agreement (PA) with the Advisory Council on Historic Preservation (ACHP), OHP and any other agencies or entities FERC elects to include. One of the PA stipulations will be the completion and implementation of a HPMP to be included with the license application.

The HPMP will consider direct and indirect effects of continued Project O&M on NRHP-listed or eligible archaeological and architectural resources and will require avoidance and protection of specified resources, whenever possible. Processes and procedures will be developed for general and site-specific treatment measures, including minimization and mitigation measures to be taken should license implementation create unavoidable adverse effects to historic properties.

COORDINATION WITH OTHER STUDIES

To the extent feasible, SCE will coordinate archaeological and architectural resources field studies with other Project-related environmental studies (e.g., TCP and habitat surveys) and conduct them in a manner that does not affect other sensitive natural resources. When conducting archaeological and architectural resources or other investigations, Project sponsors and/or their contractors should not violate other federal or state laws or regulations protecting natural resources including but not limited to the ESA and CWA. Project sponsors should consider that

Tribes may utilize natural resources for subsistence or specific ceremonial uses and should avoid affecting those uses or events while conducting studies.

4.4.5.2.8 CONSISTENCY OF METHODS WITH GENERALLY ACCEPTED SCIENTIFIC PRACTICES

The proposed study methods discussed in this document are consistent with the study methods followed in several recent relicensing projects. These methods have been accepted by the participating Indian Tribes, agencies and other interested parties associated with those projects. The methods presented in the Study Plan are consistent with ACHP guidelines for compliance with the requirements of Section 106 of the NHPA found in 36 CFR 800.

4.4.6 SCHEDULE, PERIODIC REPORTING AND ONGOING CONSULTATION

The anticipated Study Plan development and implementation schedule is identified in Table 4-20 and Table 4-21.

TABLE 4-20 ANTICIPATED POST PAD/NOI STUDY PLAN DEVELOPMENT MILESTONES AND FERC PROCESS THROUGH STUDY PLAN DETERMINATION

TASK	RESPONSIBLE ENTITY	SCHEDULE MILESTONES
Archival research and records search	SCE	Fall 2018
File NOI/PAD with FERC along with Proposed Study Plans	SCE	May 1, 2019
FERC Holds Scoping and Site Visit	FERC	July 1, 2019 – July 31, 2019
Deadline for Comments on PAD and Study Plan Requests	Stakeholders	Aug 30, 2019
Preliminary Field Season[1]	SCE	2019
Fall TWG Workshop	SCE & TWG	Nov 2019
Request for waiver of 18 CFR 5.12 & 5.13	SCE	Sep 2, 2019
FERC Director's Study Plan Determination (assumes waiver granted)	FERC	Nov 8, 2019
First Field Season	SCE	Early to Late Spring 2020
Draft Cultural Resources Technical Report-Inventory and Architectural Evaluation	SCE	Sept 2020
Final Cultural Resources Technical Report-Inventory and Architectural Evaluation (ISR)	SCE	Nov 9, 2020
Second Field Season-Archaeological Site Evaluations	SCE	Early to Late Spring 2021
Draft Archaeological Site Testing and Evaluation Report (USR)	SCE	Nov 9, 2021
Final Archaeological Site Testing and Evaluation Report (USR), Draft Historic Properties Management Plan (HPMP)	SCE	Feb 2022
Final HPMP	SCE	June 2022
License Application	SCE	June 2022

[1] Note: Because the 2019 field season precedes the Study Plan Determination is noted as "preliminary" because to avoid confusion with the FERC sequence of field season followed by Initial Study Report. For similar reasons, a fall TWG workshop is offered to review the results of the preliminary field season

TABLE 4-21 ANTICIPATED ADDITIONAL CONSULTATION TASKS

IMPLEMENTATION DETAIL FOR RESOLUTION	SCHEDULE FOR RESOLUTION
Timeline of first and second and field season depends on results of consultation and concurrence of stakeholders with APE	Prior to August 2019
Timeline of first and second field seasons are dependent on weather conditions	Not applicable
Timeline of second field season and reporting are dependent on the results of consultation and concurrence of stakeholders with how many archaeological sites will be tested and evaluated	December 2020
Timeline of preparation of the HPMP is dependent on the results of the first and second field season as well as consultation and concurrence of stakeholders with survey and evaluation results	October 2022

4.4.7 STUDY PLAN CONSULTATION RECORD

This Study Plan was developed in consultation with the Bishop Creek Cultural Resources 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 section summarizes the key consultation milestones for each Study Plan (Table 4-22), and how SCE addressed comments received through the consultation process. **Error! Reference source not found.** is a Response to Comments Table for comments received from stakeholders, and how comments were addressed in the final Study Plan. If a stakeholder comments are incorporated,

Error! Reference source not found. will provide rationale based on Project specific information and the FERC Study Plan Criteria (18 CFR § 5.9).

TABLE 4-22 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
Revised Study Plans	11/15/2018	TWG	12/4/2018 to 12/6/2018	1/7/2019
Proposed Study Plans (filed with PAD)	5/1/2019	TWG	6/12/2019 and 6/19/2019	7/12/2019

TABLE 4-23 SCE RESPONSES TO COMMENTS RECEIVED ON STUDY PLANS

COMMENT NO.	DATE OF COMMENT	ENTITY	COMMENT	SCE RESPONSE
1	2/14/2019	Ashley Blythe Haverstock, USFS	Nexus and Rationale: P3. The terms defined in the beginning of the document need to be updated to reflect that the word "cultural resource" was replaced with "archaeological architectural resources." A reference to the age criteria would be appropriate here – as it is, the document reads as though architectural resources will be recorded regardless of age.	Noted – SCE has Updated page 1 Section 1.1.1, paragraph 1 to clarify this Study Plan. Updated page 3 paragraph 2 last sentence for clarity
2	2/14/2019	Ashley Blythe Haverstock, USFS	Objectives: P4 Bullet 2 – To be more consistent with the language at 36 CFR 800, the Project purpose is to identify all archaeological and architectural resources within the APE, determine which are historic properties, and develop the HPMP based on those results. The terminology is a bit mixed up.	Noted: these changes have been made to the revised Study Plan and clarifications made
3	2/14/2019	Ashley Blythe Haverstock, USFS	Study Area: P4 – Please move this statement to the first paragraph in this section to make it clear the lead federal agency is FERC and what role SCE has in the process. This should also be made clear in the introduction of the document to be consistent with Section 106 requirements for identifying the lead federal agency. *"As provided for in 18 CFR § 5.5(e), the licensee, under separate cover, has requested FERC to designate the licensee as FERC's nonfederal representatives for purposes of initiating consultation under Section 106 of the NHPA and the implementing regulations of 36 CFR § 800.2(c)(4)."*	Noted: these changes have been made to the revised Study Plan and clarifications made

COMMENT NO.	DATE OF COMMENT	ENTITY	COMMENT	SCE RESPONSE
4	2/14/2019	Ashley Blythe Haverstock, USFS	Study Area: It should be made more explicit that this APE has been made in consultation with the agencies. If SHPO consultation has already occurred, please provide citations in text	Noted: these changes will be made to the Study Plan and clarifications made. Formal Consultation with the SHPO or Tribes has not occurred because SCE has not filed the PAD and NOI yet. This has to be done prior to FERC delegating authority to consult to SCE.
5	2/14/2019	Ashley Blythe Haverstock, USFS	Methods: P.55 – Section 6.2.3 – BLM and INF have specific protocols tied to NAGPRA that are different than the CHSC when remains are located on Federal lands. Following the CHSC protocol is only applicable to the lands owned by SCE. If this section is necessary to include, a simple statement that the discovery of human remains during inventory will follow the protocols of the appropriate land management agency. Regardless of jurisdiction, the scene will be secured, and the appropriate archaeologist and land managing law enforcement officer contacted.	Noted: The appropriate sections have been updated.
6	2/14/2019	Ashley Blythe Haverstock, USFS	Methods: P.57 – Section 6.2.6 – Portions of this section are extralegal and inconsistent with Section 106 and several other extremely important Federal laws. We highly recommend removing the whole of Section 6.2.6. I can provide more clarification if necessary, but generally, this section suggests that we would be looking for items of cultural patrimony (which have a specific legal definition tied to NAGPRA), that we would only be evaluating Native American sites, and that	Noted: The appropriate sections have been updated.

COMMENT NO.	DATE OF COMMENT	ENTITY	COMMENT	SCE RESPONSE
			items removed during excavation would be distributed/curated based on a consultation process regardless of land jurisdiction. There is too much editing necessary to make this section compliant with applicable Federal laws. Section 6.2.5 covers the necessary information – that the evaluation plan would be developed in consultation. It could be simply stated that all archaeological and architectural resources would be evaluated as part of this process.	
7	2/14/2019	Ashley Blythe Haverstock, USFS	Methods: P. 59 Section 6.2.8 – Is the PA and HPMP standard FERC procedure?	SCE's understanding is that a PA and HPMP is FERC standard procedure, because the HPMP is an alternative to the typical Section 106 process. Therefore, there must be a PA to enact the HPMP.

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4.5 TRIBAL RESOURCES STUDY PLAN (CULT 2)

4.5.1 PROJECT NEXUS AND RATIONALE FOR STUDY

The Project is located on Bishop Creek in Inyo County, California, near the city of Bishop. The Project has five powerhouses located mainly along the south, middle, and north forks of Bishop Creek on the steep eastern slope of the Sierra Nevada. The Project is licensed by FERC (No. 1394) and is owned by SCE. The current license for the Project was issued in 1994 for a term of 30 years; the license will expire on June 30, 2024. SCE has begun the relicensing processing, with an anticipated date of 2022 for background information submission to FERC.

A TWG of stakeholders, including federal land-managing agencies and Indian Tribes, identified the need to conduct ethnographic/tribal background research and a Native American TCP study. This Tribal Resources Study Plan is presented to address that stated need.

Potential resource issues include Indian Trust Assets (ITA), TCPs, Tribal economic ventures, and other resources of traditional, cultural, or religious importance to the Native American community. An ITA is defined as a legal interest in property held in trust by the United States government for Indian Tribes and individuals, or property protected under United States law for Indian Tribes and individuals. Although the Project is located more than 2 miles from the closest identified ITA, it will be important to ensure that there are no additional ITAs that may not be known at present. A TCP is defined as a property that is eligible for inclusion in the NRHP based on its associations with the cultural practices, traditions, beliefs, lifeways, arts, crafts, or social institutions of a living community. There may be any number of gathering areas related to cultural practices in the Project area, as the local Native American community continues to access medicine plants, food plants, materials for tools, and many other items as part of their ongoing cultural lifeways. No interviews have yet been conducted to identify or discuss such places of importance specific to this Project.

FERC's decision to issue a new license is considered an "undertaking" pursuant to 36 CFR 800.16(y). The NHPA requires federal agencies to take into account the effect of undertakings on historic properties. Continued Project O&M and other activities, including public recreation activities, may have an adverse effect on historic properties, including Tribal Resources. The effect may be direct (e.g., result of ground-disturbing activities), indirect (e.g., public access to

Project areas), or cumulative (e.g., caused by a Project activity or public access in combination with other past, present and reasonably foreseeable future projects). ITAs, TCPs and other resources of traditional, cultural, or religious importance to the Native American community are among the resource types that may be affected. This study focuses on these potential Project effects to historic properties.

4.5.1.1 AREA OF POTENTIAL EFFECTS AND STUDY AREA

Under 36 CFR§800.16(d), the APE is defined as "the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historical properties, if any such properties exist." For Tribal Resources, the Project boundary will serve as a draft APE (Figure 4-5); it is acknowledged that the APE may be amended based on consultation and resource issues.

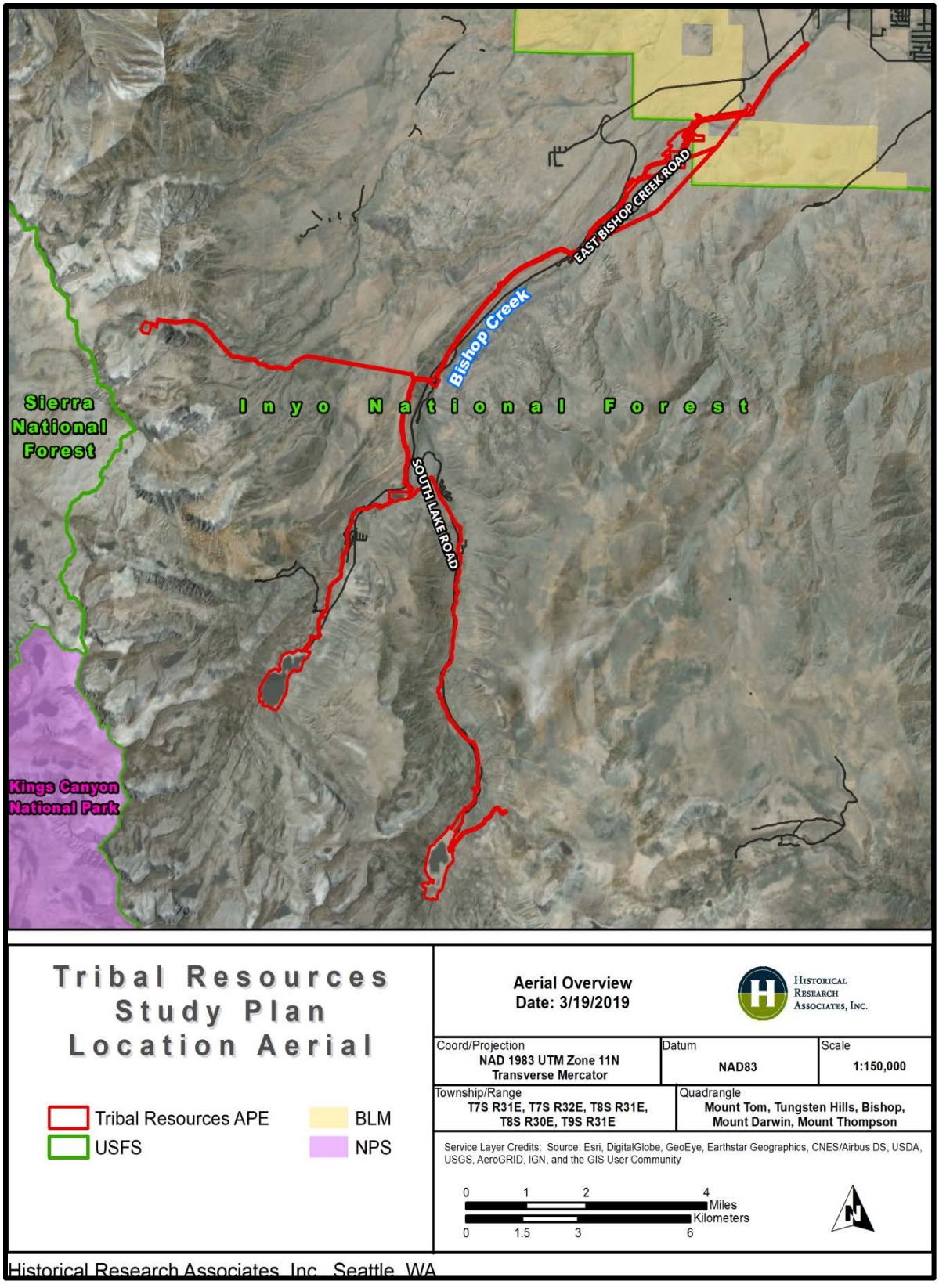


FIGURE 4-5 PROPOSED APE

4.5.2 STUDY GOALS AND OBJECTIVES

The principal goal of this Study Plan implementation is to assist FERC in meeting its compliance requirements under Section 106 of the NHPA, as amended, by determining if licensing of the Project will have an adverse effect upon historic properties, in this case Tribal Resources. Following 18 CFR §5.6 (d)(3)(xii) and §5.9(b)(1), the goals and objectives of the Tribal Resources Study Plan are to identify Tribal Resources that may be affected by O&M of FERC Project 1394. It is the goal of the study to identify Tribal Resources through archival research, oral interviews, and field inspections, and to ensure that such places are not impacted by O&M. Research in state and SCE archives suggest that an ethnographic overview/background of the Project area has never been conducted, and that for the previous license issued in 1994, there was minimal tribal outreach, if any. Details regarding methods and specific information located in Section 1.4.

FERC PAD regulations (18 CFR § 5.6 [d][3][xii]) state that Tribal Resources are to be one of the content sections of the PAD, and are to include a description of Indian Tribes, tribal lands, and interests that may be affected by the Project. Components of this description include:

- Identification of information on resources to the extent that existing Project construction and operation affecting those resources may impact tribal cultural or economic interests, e.g., impacts of Project-induced soil erosion on tribal cultural sites; and
- Identification of impacts on Indian Tribes of existing Project construction and operation that may affect tribal interests not necessarily associated with resources specified in paragraphs (d)(3)(ii)-(xi) of this Section, e.g., tribal fishing practices or agreements between the Indian Tribe and other entities other than the potential applicant that have a connection to Project construction and operation.

An additional goal of the Study Plan implementation is to ensure that tribal values and resources are identified and acknowledged from a tribal perspective. Similarly, insuring that the land-managing agencies and any other stakeholder agencies have their program needs met with respect to the Project APE is a goal of the work. Finally, it is anticipated that management issues will be identified so they can be described and developed in subsequent planning efforts for the life of the license.

SCE acknowledges that any Native American Tribes and Tribal or cultural stakeholders may submit other goals to the FERC in the future as a part of the comment process.

4.5.3 REVIEW OF EXISTING INFORMATION

4.5.3.1 SUMMARY OF RECORD SEARCHES/ARCHIVAL RESEARCH

SCE conducted an initial search of records and maps on file at SCE archives, the INF, BLM, and the EIC of the California Historical Resources Information System (CHRIS) at the University of California, Riverside. Interviews and consultation notes with various settlers and Indians in the study area are found in the Eastern California Museum and provide some knowledge of the area. SCE requested a search of the Sacred Land Files at the California Native American Heritage Commission (NAHC) and a list of Native American contacts who may have an interest in any portion of the Project area. From that list, SCE provided a notification letter to the Tribes informing them about the pending relicensing and requesting their participation. A cursory review of general ethnographic literature of the region was conducted to gather information regarding any previously recorded Tribal Resources within the APE. The records searches included all lands within the FERC boundary.

4.5.3.2 INITIAL RECORD SEARCH RESULTS

SCE, INF, BLM, NAHC and the CHRIS had no information about Tribal Resources located within the APE. None of the Tribal groups contacted have yet provided any information about Tribal Resources in the study area, but the Bishop Paiute Tribe participated in one TWG meeting and stated that they have an interest in a seed-gathering area to the north of the Project.

A limited review of ethnographic literature indicates that Bishop Creek and the nearby areas were inhabited by Paiute for a long time. The area was utilized for habitation and subsistence, as well as irrigation (Steward 1933). Map 2 of Julian Steward's 1933 *Ethnography of the Owens Valley Paiute* depicts several places that were utilized within and near the APE. This utilization was further confirmed during a study of Owens Valley irrigation and agriculture conducted by Harry Lawton and his colleagues (1976).

4.5.3.3 DATA GAPS

As noted, no ethnographic background studies of Tribes appear to have been prepared for the Project area, even for the earlier license, and this absence of a database makes identification of data gaps problematic. The following are considered data gaps to be rectified in the study:

- Location and nature of Tribal Resources that could be affected by Project O&M activities.
- Native American individuals or groups unaffiliated with federally-recognized Tribes may not be readily identified.
- Historic era and ethnographic Native American data lacking from context.

4.5.4 METHODS

4.5.4.1 STUDY METHODS

The Tribal Resources studies will involve a multi-step process to include archival research, oral interviews, field visits, identification of resources and NRHP evaluations. These steps will be conducted in consultation with the State Historic Preservation Officer (SHPO), American Indian Tribes, INF, and BLM, as appropriate. To facilitate the Tribal Resources study, SCE will retain a qualified, professional ethnographer who meets the Secretary of the Interior's Historic Preservation Professional Qualification Standards for Cultural Anthropology and the qualifications for ethnographer as defined in Appendix II of National Register Bulletin No. 38 (Parker and King 1998). SCE will coordinate the selection of the ethnographer(s) with the assistance of affected Tribes and other interested cultural/Tribal stakeholders.

Study methods are described in the following subsections.

4.5.4.2 ARCHIVAL RESEARCH

As stated, no known ethnographic study has been conducted for the Project or in the Project vicinity, necessitating a baseline ethnography/ethnohistory to provide context and structure to the investigations. Archival research will be conducted to identify previous studies and ethnographic information that can be used to establish a context by which potential Tribal Resources may be identified and evaluated. Archival data about Owens Valley are located in widespread repositories but provide a picture of native life which supplements the commonly-referenced ethnographic studies of the last century. Potential information sources include the following:

- Bancroft Library (University of California, Berkeley)
- California State Archives
- California State Library, California History Room
- Collections and archives at the Laws Railroad Museum and Historic Site
- Early newspaper accounts in the Annie Mitchell Local History Research Room, Tulare County Library (Visalia)
- Ford Survey
- Hulse and Essene stories
- Huntington Library
- Merriam and Harrington notes available online
- National Archive and Records Administration (Los Angeles and San Bruno)
- Natural History Museum of Los Angeles County (Los Angeles) Andrew Forbes photographs
- Oral-history tapes and background data held at the Eastern California Museum
- Other documents specific to the area
- Published and unpublished ethnographies
- Reports at the BLM, Bishop
- Reports at the INF, Bishop
- University of California, Davis, C. Hart Merriam Collection

Work proposed would obtain, compile, and summarize archival data available for the Bishop Creek area to develop an ethnohistorical background and contextual history.

4.5.4.3 TRIBAL INTERVIEWS AND IDENTIFICATION OF RESOURCES

In conjunction with the Archival Research, the SCE Ethnographer will consult with appropriate Tribal elders and other Tribal representatives to identify places, gathering areas, resources of traditional cultural or religious importance (including TCPs), and other resources that may be present in the APE. Contact will include a combination of written correspondence to tribal governments, follow-up interviews, and field visits if requested. Oral histories, if released by the interviewee, will be included in the discussion of Tribal Resources. Principal tasks anticipated are listed below:

- Contact Tribes to identify ITAs, TCPs and other resources of traditional, cultural, or religious importance to Native Americans located within the Study Area.
- Gain appointments with Tribal Councils, as necessary, to acquire release documents or access to tribal elders and representatives and to confirm interests.
- Interview tribal elders and other representatives as required to define tribal resources located in the Study Area and to establish the significance of those resources. SCE will contact the appropriate Tribes (listed in the Tribal Resources section of the PAD) to arrange for initial Tribal visits.
- Interviews with Tribal elders or other representatives who may have knowledge of special interest areas within the Project Study Area/APE will be respectfully conducted and documented by a qualified ethnographer.
- The ethnographer may accompany the archaeologists during field inventory to identify unique or unusual gathering areas, tended native gardens, historic artifacts made/used by Native Americans, and other resources.
- Site visits with tribal representatives may be appropriate or necessary to define boundaries and the nature of potential TCPs or other Tribal Resources. Resource location information developed as part of this process will be kept confidential if necessary and will be respectfully documented by the ethnographer.
- If participating Native American Tribes do not wish to disclose the locations of potential resources due to religious, confidentiality, or other reasons, SCE will work with the Tribes to identify the general issues and concerns that the Tribe(s) may have regarding potential Project effects and will work to develop agreeable measures to alleviate these concerns. SCE shall not disclose tribal resource data to any parties other than federal land management agencies, FERC and/or SHPO. If the participating Tribes instruct SCE in writing, SCE may disclose resource information to the ECIC.
- Interviews and resources will be documented as communicated by tribal representatives, but in all cases, sufficient information will be presented to allow reviewers to analyze resources values.

Tribal representatives and the ethnographer will determine the scope and breadth of interviews, along with various review obligations and agreements, but the nature of interview questions will involve knowledge about the heritage of Bishop Creek and relationship of the respondent to the area. If necessary, SCE will arrange for an introductory meeting FOR SCE, Tribal representatives and/or Tribal Council, and the ethnographer. Interviews conducted with reasonably available Tribal representatives will be considered similar to other consultant services, and Tribal interviewees will be compensated for their time during the interview.

4.5.4.4 PROJECT SITE VISIT

Tribal interviewees or representatives and the ethnographer may wish to visit the Project area and archaeological sites identified during the Archaeological and Built Environment Study Plan fieldwork. The purpose of the visit would be to provide Tribal representatives the opportunity to examine archaeological sites encountered during the study and for the ethnographer to obtain additional information potentials. After the site visit(s) Tribal representatives may choose to share additional knowledge.

4.5.4.5 NATIONAL REGISTER OF HISTORIC PLACES EVALUATION

In addition to the criteria set forth at 36 CFR § 60.4, properties can have other cultural values that should be considered. Amendments to the NHPA in 1992 (§101[d][6][A]), specify that properties of traditional religious and cultural importance to an Indian Tribe may be determined eligible for inclusion in the NRHP because of their "association with cultural practices or beliefs of a living community that are: 1) rooted in that community's history; and 2) are important in maintaining the continuing cultural identity of the community." Therefore, a property may also be significant if it has traditional or ethnographic significance because of its ties to the cultural past of communities or groups, including Native Americans. Formal evaluations will be submitted to the SHPO for concurrence.

The NRHP evaluation of Tribal Resources follows the same general procedures and criteria used for determining the significance of archaeological and built-environment sites. Tribal Resources may or may not be characterized as sites in the archaeological and historical sense, so they would not necessarily be inventoried and evaluated under the Archaeological and Built Environment Study Plan implementation. There can be considerable overlap between Tribal Resources and areas categorized as archaeological sites because the physical and cultural distinctions are significant enough to provide unclear differentiation between the two and necessitate separate evaluation assessments. As an example, the archaeological document may record features and artifacts, but the Tribal Resource document might describe an important plant community associated with the site or a trail that connects the site to another place. The Tribes may be agreeable to having archaeological site descriptions expanded to include Tribal Resources in a more holistic approach.

- Develop a Tribal Resources NRHP Eligibility Evaluation Work Plan in consultation with the Tribes and resource agencies, as appropriate, and conduct studies.
- Conduct Tribal Resources NRHP-eligibility studies in adherence to National Register Bulletins Number 15 (NPS 1997) and Number 38 (Parker and King 1998).
- NRHP evaluations will be conducted in consultation with appropriate Native American Tribes, appropriate federal land management agencies, FERC and SHPO.
- The evaluations will be provided to the INF, BLM and Tribes for review 30 days prior to submitting to the California OHP.

4.5.4.6 IDENTIFY AND ASSESS POTENTIAL PROJECT EFFECTS ON NRHP-ELIGIBLE TRIBAL RESOURCES

Tribal resources are unique in the NRHP framework, as they are identified and evaluated by Tribal specialists in conjunction with others, such as the ethnographer, who may be assisting them in documentation. Similarly, evaluation of integrity of Tribal resources require specialized information from the community or group who has values related to the place. Integrity of relationship describes the values of the place to the relationship with the traditional or tribal activity and may not be connected to what the place looks like. As long as the community maintains its association with the place, the integrity of the relationship is intact. With integrity of condition, again it is to be understood that such values are connected to what the community believes is important, even if the place looks totally disheveled to an outsider. It is the relationship of the community to the place that is important, not what it looks like to a non-community member. If the community believes the place to be significant and provides compelling information about the place, then such places may be evaluated as NRHP-eligible.

36 CFR § 800.5 describes the assessment of adverse effects and notes that the criteria of adverse effect will be applied in consultation with the SHPO and Indian Tribe (community) that attaches religious and/or cultural significance to identified historic properties. This application of effect will be within the APE. FERC shall consider any views concerning such effects which have been provided by stakeholders and other interested parties.

4.5.4.7 REPORTING AND HISTORIC PROPERTIES MANAGEMENT PLAN

The results of the Tribal Resources study will be documented in a Tribal Resources inventory and evaluation report (referred to as the Tribal Resources Technical Study Report) which is

likely to be considered confidential and thus would not necessarily be distributed to the general public or the CHRIS. The Tribal Resources Technical Study Report will be formatted in accordance with the Secretary of the Interior (48 CFR 44720-23), OHP (1995), FERC, SCE, BLM and INF standards and guidance. This report will include, but not necessarily be restricted to the following information:

- Project location and description
- Regulatory setting
- Ethnohistory of the Bishop Creek area
- Ethnographic context of the Bishop Creek and adjacent areas
- Review of tribal and ethnographic resources
- Study methodology
- Study findings
- Tribal Resource evaluations
- Management recommendations
- Relevant Project and tribal resource mapping

The Tribal Resources Technical Study Report will be submitted to BLM, INF, the Tribes and any other appropriate resource agencies and stakeholders for a 45-day review and comment period. Comments on the draft report will be addressed in the final report and distributed with the Draft License Application.

SCE anticipates FERC will enter into a PA with the ACHP, SHPO, and any other agencies or entities FERC elects to include. One of the PA stipulations will be the completion and implementation of a HPMP to be included with the license application.

The HPMP will take into account direct and indirect effects of continued Project O&M on NRHP-listed or eligible Tribal Resources and will require avoidance and protection of specified resources, whenever possible. Processes and procedures will be developed for general and site-specific treatment measures, including minimization and mitigation measures to be taken should license implementation create unavoidable adverse effects to historic properties.

4.5.4.8 COORDINATION WITH OTHER STUDIES

- The location of culturally important plant species that are identified by the Tribes will be shared with botanists if data are not confidential and will be plotted as part of the Botanical Plant Communities, Special-Status Plants, and Invasive Weeds Study, limited to the APE as defined. These maps will also be included in the Tribal Resources Technical Study Report.
- Information about culturally important aquatic species will be shared with the Aquatic Study and will be incorporated into the Tribal Resources Technical Study Report.
- The location of culturally important plant species will be considered in the Land and Project Roads and Trails Assessment, to the extent possible without divulging confidential information.
- Information on sites associated with prehistoric and ethnographic-period Native American occupation and use of the landscape will be shared when allowed to archaeologists and architectural historians working on the Archaeological and Built Environment Study.

4.5.4.9 CONSISTENCY OF METHODS WITH GENERALLY ACCEPTED SCIENTIFIC PRACTICES

All phases of the Tribal resources investigation will be conducted in accordance with the Native American community consultation standards outlined in Section 101 of the NHPA and discussed in the ACHP publication, *Consultation with Indian Tribes in the Section 106 Review Process: A Handbook* and policies laid out on the ACHP website at n https://www.achp.gov/indian-tribes-and-native-hawaiians/initiatives/achp-native-american-policies.

Contact, interviews, fieldwork and tribal resource documentation will be implemented in accordance with Section 106 of the NHPA, as amended, and shall take into consideration National Register Bulletin No. 38 (Parker and King 1998).

Tribal Resources documentation will be implemented in accordance with Section 106 of the NHPA, as amended, and shall take into consideration National Register Bulletin No. 38 (Parker and King 1998).

Evaluations will be conducted in adherence to National Register Bulletin Number 15 (NPS 1997).

4.5.5 SCHEDULE, PERIODIC REPORTING, AND ONGOING CONSULTATION

The anticipated Study Plan development and implementation schedule is identified in Table 4-24 and Table 4-25.

TABLE 4-24 ANTICIPATED POST PAD/NOI STUDY PLAN DEVELOPMENT MILESTONES AND FERC PROCESS THROUGH STUDY PLAN DETERMINATION

TASK	RESPONSIBLE ENTITY	SCHEDULE MILESTONES
File NOI/PAD with FERC along with Proposed Study Plans	SCE	May 1, 2019
FERC Holds Scoping and Site Visit	FERC	July 1, 2019 – July 31, 2019
Deadline for Comments on PAD and Study Plan Requests	Stakeholders	Aug 30, 2019
Request for waiver of 18 CFR 5.12 & 5.13	SCE	Sep 2, 2019
FERC Director's Study Plan Determination (assumes waiver granted)	FERC	Nov 8, 2019
First Interviews	SCE	Nov 2019
First Field Season	SCE	Early Spring 2020
Interim Draft Tribal Resources Technical Report-Inventory and Resource Evaluation (ISR)	SCE	Nov 9, 2020
Interim Final Tribal Resources Technical Report-Inventory and Resource Evaluation	SCE	Feb 2021
Second Field Season if Needed	SCE	Early to Late Spring 2021
Supplemental or Revised Tribal Resources Technical Report (USR)	SCE	Nov 9, 2021
Supplement or Revised Final Tribal Resources Technical Report; Draft HPMP	SCE	Feb 2022
Final HPMP	SCE	June 2022
License Application	SCE	June 2022

TABLE 4-25 ANTICIPATED POST PAD/NOI STUDY PLAN DEVELOPMENT MILESTONES AND FERC PROCESS

IMPLEMENTATION DETAIL FOR RESOLUTION	SCHEDULE FOR RESOLUTION
Timeline of first field season depends on results of consultation, accessibility and availability of tribal informants, and concurrence of stakeholders with APE	Prior to August 2019
Timeline of first (and second?) field seasons dependent on weather conditions	Not applicable
Timeline of second field season and reporting are dependent upon need for additional work; all tribal resource issues may be identified in the first field season; the results of consultation and concurrence of stakeholders with how many resources will be evaluated	December 2020
Timeline of preparation of the HPMP is dependent on the results of the first (and second?) field season as well as consultation and concurrence of stakeholders with evaluation results	October 2022

In addition to these milestones, quarterly information may be supplied to the stakeholders regarding progress and information.

4.5.6 STUDY PLAN CONSULTATION RECORD

This Study Plan was developed in consultation with the Bishop Creek Cultural Resources 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 section summarizes the key consultation milestones for each Study Plan (Table 4-26), and how SCE addressed comments received through the consultation process. Table 4-27 is a Response to Comments Table for comments received from stakeholders, and how comments were addressed in the final Study Plan. If a stakeholder's comments are not incorporated, Table 4-27 will provide rationale based on Project specific information and the FERC Study Plan Criteria (18 Code of CFR § 5.9).

TABLE 4-26 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
Revised Study Plans	11/15/2018	TWG	12/4/2018 to 12/6/2018	1/7/2019
Proposed Study Plans (filed with PAD)	5/1/2019	TWG	6/12/2019 and 6/19/2019	7/12/2019

TABLE 4-27 SCE RESPONSES TO COMMENTS RECEIVED ON STUDY PLANS

COMMENT NO.	DATE OF COMMENT	ENTITY	COMMENT	SCE RESPONSE
1	2/14/2019	Ashley Blythe Haverstock, USFS	This particular plan misses the mark the agencies were going for when we suggested this study. The way it is currently written, it is confusing a tribal consultation plan, the archaeological Study Plan, and an ethnography plan. TCPs can by defined by any culture – not just Native Americans. The study area may have significance to other communities – packers, climbers, sheepherders and the goal is to ensure those values are taken into consideration pursuant to Federal law. As a Native American consultation plan, it is too narrowly focused on what has to be a bounded resource (which could be id-ed in the archaeological study) and does not give the tribal partners an opportunity to voice concern about other resources of value that we should consider but may not rise to the level of TCP. Both BLM and INF feel this plan should be reworked to be more consistent with a more robust ethnographic Study Plan.	SCE agrees with this comment and has substantially re-written the plan based on our communications with the BLM and USFS.

4.5.7 REFERENCES

California State Office of Historic Preservation (OHP). 1995. *Instructions for Recording Historical Resources*. Sacramento, California. http://scic.org/docs/OHP/manual95.pdf

Lawton, Harry, P. Wilke, Mary DeDecker and W. Mason. 1976 *Agricultural Among the Paiute of Owens Valley*. The Journal of California Anthropology 3(1).

National Park Service (NPS). 1983. Archaeology and Historic Preservation: Secretary of the Interior's Standards and Guidelines *in* the Federal Register, September 29, 1983 (48FR44716). Department of the Interior, Washington, D.C.

National Park Service (NPS). 1997. *How to Apply the National Register Criteria for Evaluation.* Bulletin 15. U.S. Department of the Interior, National Park Service, Washington, D.C..

Parker, Patricia L., and Thomas F. King. 1998. *Guidelines for Evaluating and Documenting Traditional Cultural Properties*. National Register Bulletin 38 (First published 1990). U.S. Department of the Interior, National Park Service, Washington, D.C.

Steward, Julian. 1933. *Ethnography of the Owens Valley Paiute*. University Publications in American Archaeology and Ethnology, Volume 33, No 3, pages 233-350.

5.0 REQUESTED STUDIES NOT ADOPTED

The USFS requested a few studies that SCE chose not to adopt as separate studies but rather integrate into existing studies. These are summarized below:

- Mule Deer/Migratory Species Use Study Plan: Determine if the migratory patterns of mule deer and other species are affected by the Project.
  - The proposed objectives of this Study Plan were incorporated into the Wildlife Study Plan for increased efficiency.
- Special Status Species Study Plan: Assess special status raptors, bats and willow flycatcher and determine wolverine use of the Project area.
  - Based on discussions during TWG meetings, wolverines likely do not occur in the Project area. The other proposed objectives of this Study Plan were incorporated into the Wildlife Study Plan for increased efficiency.
- Vegetation Community Assessment: Classify and map vegetation community types in Project area and compare to historical information.
- Angler Creel Census: Evaluate angler effort, harvest, and success in Project affected waters.
  - SCE incorporated this objective into the Recreation Use and Needs Study Plan.
- Aquatic Special Status Species Study Plan: Evaluate whether any special status aquatic dependent species and their habitat are affected by Project operations and/or Project-related impacts.
  - SCE is not aware of special aquatic species that would warrant their own study. Per TWG discussions, aquatic amphibians are not present in the Project area and would be unlikely to thrive because of fisheries management strategies in place. Special status pond-weed (or any other botanical special status) will be addressed in the botanical study. An Amphibian survey component has been added to the Wildlife Study Plan.
- Hydrology Study Plan: Develop unimpaired and regulated hydrology information for Project-affected stream reaches – Suggest evaluation with Indicators of Hydrologic Alteration (IHA) Model.
  - It is SCE's understanding that much of this information has been developed and will be incorporated into the Operations Models. SCE has not incorporated IHA into its studies as no clear project nexus has been discussed.

Additionally, FERC's Scoping Document 1 (SD1) identified the effects of project operation and facilities on the potential spread of invasive mussels to project reservoirs as an area of interest. SCE review of existing information and consultation with the Fish and Aquatics TWG indicates

that the limnology of the Bishop Creek watershed does not support the establishment of mussel populations, however to address this concern, SCE will conduct a literature review of habitat requirements in consultation with the relevant resource management agencies; review with Project Operations staff their observations of mussel presence/absence in the project area, and review SCE's corporate Invasive Mussel Prevention Plan for appropriate updates.

6.0 APPENDICES

Appendix A Supplemental Consultation Documents and Correspondence: May 2, 2019 to August 1, 2019

Appendix B Listed and Other Special Status Plant Species Reported from Bishop Project Region

Appendix C Inyo National Forest Fish/Wildlife Project Review July 11, 2018 (Section 3.3 Fish Distribution Baseline Study Plan Appendices)

Appendix D General Recreation Survey (Section 4.1 Recreation Use and Needs Study Plan Appendices)

Appendix E Creel Survey (Section 4.1 Recreation Use and Needs Study Plan Appendices)

Appendix F Site Inventory Form (Section 4.1 Recreation Use and Needs Study Plan Appendices)

APPENDIX A
SUPPLEMENTAL CONSULTATION DOCUMENTS AND CORRESPONDENCE: MAY 2, 2019 TO AUGUST 8, 2019

APPENDIX B
LISTED AND OTHER SPECIAL STATUS PLANT SPECIES REPORTED FROM BISHOP PROJECT REGION

LISTED AND OTHER SPECIAL STATUS PLANT SPECIES REPORTED FROM BISHOP PROJECT REGION

Reported occurrences in the Project region are from the CNNDD, a program maintained by the CDFW. There are no reported occurrences of listed federal plant species. See end of table for meaning of species status codes.

Scientific Name	Common Name	Status	General Habitat Description	Known Elevation Range, feet above MSL	Reported Occurrence
STATE LISTED RARE PLANTS					
Lupinus padre-crowleyi	Father Crowley's lupine	SR, SCC, CNPS: 1B.2	This plant grows on a substrate of boulders and gravelly sand of granitic origin. It grows in the openings of upper montane forests, sagebrush scrub flats, and riparian scrub. Plants usually occur as isolated individuals. It occurs in the understory of red fir forest and on Great Basin scrub flats, riparian scrub, riparian forest, and upper montane coniferous forest. Local subpopulations are generally comprised of scattered individuals on steep avalanche chutes, in sunny sites in drainages, and in valley bottoms. Blooming period: Jul – Aug.	7,216 – 13,120	Upper West Fork of Coyote Creek, tributary to Bishop Creek.
USFS SPECIES OF CONSERVATION CONCERN (SCC) AND OTHER SPECIAL STATUS PLANTS					
Allium atrorubens var. *atrorubens*	Great Basin onion	CNPS: 2B.3	Big sagebrush scrub and pinyon-juniper woodland on rocky or sandy soil. Blooming period: May - June	3,600 – 7,000	Lower McGee Creek.
Boechera dispar	pinyon rockcress	CNPS: 2B.3	Pinyon and juniper woodland; desert woodland and scrub. Blooming period: Mar - Jun	3,600 – 7,600	Slopes above Coyote Creek, tributary to Bishop Creek.
Botrychium crenulatum	scalloped moonwort	SCC, CNPS: 2B.2	Bogs and fens, moist meadows near creeks, seeps, lower montane coniferous forest, and freshwater marshes and swamps. Usually occurs in wetlands, but occasionally found in non-wetlands. Blooming period: Jun – Sept.	4,920 – 10,760	East fork of Coyote Creek, tributary to Bishop Creek.
Calochortus excavatus	Inyo County star-tulip	BLMS, CNPS: 1B.1	Found in chenopod scrub, meadows (alkaline) and seeps. Occurs mostly on fine, sandy loam soils with alkaline salts, grassy meadows in shadescale scrub. Blooming period: Apr – Jul.	3,772 – 6,560	Lower Bishop Creek between Powerhouse 6 and Bishop.
Carex scirpoidea ssp. *pseudo-scirpoidea*	single-spiked sedge	CNPS: 2B.2	Found in alpine boulder and rock fields, meadows and seeps, and sub-alpine coniferous forest. Often on limestone, mesic sites. Blooming period: Jul - Sept.	10,496 – 12,136	West fork of Coyote Creek, tributary to Bishop Creek.
Crepis runcinata	fiddleleaf hawksbeard	CNPS: 2B.2	Big sagebrush scrub, pinyon – juniper woodland, riparian. Blooming period:	3,800 – 6,000	Bishop area. Historical records stating "Bishop" do not have a specific locality. More recent records show localities south and

Scientific Name	Common Name	Status	General Habitat Description	Known Elevation Range, feet above MSL	Reported Occurrence
					north of Bishop, not in project area, but habitat is present.
Draba praealta	tall draba	CNPS: 2B.3	Meadows and seeps. Blooming period: Jul – Aug.	8,200 – 11,201	North fork Bishop Creek, South Lake and Sabrina Lake drainages.
Draba sierrae	Sierra draba	CNPS: 1B.3	Alpine fell-fields. Blooming period: Jun – Aug.	10,500 – 12,800	Upper drainages of Bishop Creek above South Lake and Coyote Ridge above Bishop and Coyote Creeks.
Lupinus magnificus var. *hesperius*	McGee Meadows lupine	CNPS: 1B.3	Great Basin scrub and upper montane coniferous forest on sandy substrates. Blooming period: Apr - Jun.	4,132 – 6,002	Upland areas above lower McGee Creek.
Lupinus padre-crowlei	Father Crowley's lupine	CNPS: 1B.2	Big sagebrush scrub, lodgepole forest, red fir forest. Blooming period: Jul - Aug	6,600 – 12,000	West fork of Coyote Creek, tributary to Bishop Creek.
Mentzelia inyoensis	Inyo blazing star	CNPS: 1B.3	Big sagebrush scrub, pinyon-juniper woodland on rocky, sometimes carbonate soil. Blooming period: Apr - Oct	3,500 – 6,000	South fork of Bishop Creek upstream of confluence with Middle Fork.
Myurella julaceae	small mousetail moss	CNPS: 2B.3	Alpine boulder and rock fields, subalpine coniferous forest.	8,000 – 9,000	Middle fork of Bishop Creek between Sabrina Lake and confluence with north fork.
Parnassia parviflora	small-flowered grass of Parnassus	CNPS: 2B.2	Meadows and seeps. Blooming period: Aug - Sept	6,000 – 8,600	Herbarium record from 1937 vaguely stated as "Buttermilk Meadows". This would be the vicinity of Birch Creek below the diversion, possibly lower McGee Creek as well. This species is also on the species list reported for a collection of *Trichophorum pumilum* below South Lake.
Penstemon papillatus	Inyo beardtongue	SCC, CNPS: 4.3	Pinyon and juniper woodlands and subalpine coniferous forest. Usually found on granitic rocky open slopes between trees, in mottled shade, or in the shelter of boulders. Blooming period: Jun - Jul.	6,500 – 9,840	Reported from the headwaters of Bishop Creek, Sabrina Lake area
Plagiobothrys parishii	Parish's popcorn flower	CNPS: 1B.1	Big sagebrush scrub, Joshua tree woodland on alkaline or mesic soils. Blooming period: Mar – Jun, sometimes as late as Nov.	2,250 – 4,200	Bishop area. Records are from the Owens Valley but habitat is present.
Poa lettermanii	Letterman's bluegrass	CNPS: 2B.3	Alpine boulder and rock fields, sandy or rocky soil. Blooming period: Jul - Aug	10,500 – 12,800	Coyote Ridge above upper Coyote Creek, tributary to Bishop Creek
Pohlia tundrae	tundra thread moss	CNPS: 2B.3	Alpine boulder and rock fields, gravelly damp soil.	8,000 – 9,000	Upper South Fork of Bishop Creek, upstream of South Lake.
Potamogeton robbinsii	Robbins's pondweed	CNPS: 2B.3	Marshes and swamps within deep water and lakes. Blooming period: Jul - Aug.	5,200 – 10,824	Records are from drainages south of project area but habitat is present.
Potentilla morefieldii	Morefield's cinquefoil	CNPS: 1B.3	Alpine boulder and rock fields, usually in low areas in alpine calcareous (or granite) rocks.	10,712 – 13,120	Coyote Ridge area, above Coyote Creek, tributary to Bishop Creek.

Scientific Name	Common Name	Status	General Habitat Description	Known Elevation Range, feet above MSL	Reported Occurrence
			Blooming period: Jul - Aug.		
Ranunculus hydrocharoides	frog's-bit buttercup	CNPS: 2B.1	Marshes or shallow springs. Blooming period: Jun - Sept.	3,608 – 8,856	Records from Bishop area as well as a record from 1941 with only a vague locality: "Bishop Creek, upper part".
Sabulina stricta (formerly Minuartia stricta)	bog sandwort, granite sandwort	CNPS: 2B.3	Alpine boulder and rock fields, alpine scrub, meadows and seeps. Blooming period: Jul - Sep	7,000 – 12,000	Coyote Ridge area, above Coyote Creek, tributary to Bishop Creek.
Solorina spongiosa	fringed chocolate chip lichen	CNPS: 2B.2	Meadows and seeps, generally on moss mats.	not known	Only record is from 1995, described as "roadside seep, along South Lake Road, 0.7 mile below South Lake" and "damp roadside seep in lodgepole pine forest."
Trichophorum pumilum	little bulrush	CNPS: 2B.2	Bogs, marshes, riparian scrub. Blooming period: Aug	8,600 – 9,800	Reported in 2013 as occurring on limestone soil in wet meadow, downstream of South Lake in area close to that described for *Solorina spongiosa.*
Triglochin palustris	marsh arrow-grass	CNPS: 2B.3	Meadows, seeps, marshes; subalpine coniferous forest. Blooming period: Jul – Aug.	6,900 – 11,000	Reported from the North Fork of Bishop Creek, upstream of confluence with South Fork.
Viola pinetorum ssp. *grisea*	grey-leaved violet	SCC, CNPS: 1B.3	Meadows and seeps, subalpine coniferous forests, and upper montane coniferous forests. Blooming period: Apr - Jul.	4,920 – 11,152	Records are from drainages south of project area but habitat is present.
FEDERAL SPECIES STATUS CODES BLMS = Bureau of Land Management Sensitive SCC = USFS Species of Conservation Concern					
STATE SPECIES STATUS CODES SSC = Species of Special Concern SR = State Rare					
CNPS (CALIFORNIA NATIVE PLANT SOCIETY) SPECIES STATUS CODES 1B.1 = Seriously threatened in California. 1B.2 = Moderately threatened in California. 1B.3 = Not very threatened in California. 2B.1 = More common outside of the state and seriously threatened in California. 2B.2 = More common outside of the state and moderately threatened in California. 2B.3 = More common outside of the state and not very threatened in California. 4 = Watch list. Plants of limited distribution or infrequent throughout a broader range of California.					

APPENDIX C
INYO NATIONAL FOREST FISH/WILDLIFE PROJECT REVIEW JULY 11, 2018

SPECIES	STATUS	SUITABLE HABITAT AND RANGE	HABITAT LOCATED WITHIN THE PROJECT AREA
Sierra Nevada bighorn sheep *Ovis canadensis sierrae*	**Endangered & Critical Hab**	Alpine and subalpine zones, with open slopes where the land is rocky, sparsely vegetated and characterized by steep slopes and canyons (USDA USFS 2001). 4,000 to 12,000 feet.	There is no potential SNBS habitat within the project area. The project area does not occur within occupied SNBS habitat and is not identified within a Recovery Herd Unit (USDI 2007).
Sierra Nevada yellow-legged frog *Rana sierrae*	**Endangered & Critical Hab**	High elevation lakes and wet meadow systems	There is no suitable habitat within the project area. The project area does not occur within critical habitat or known occupied habitat.
Mountain yellow-legged frog, northern DPS *Rana muscosa*	**Endangered & Critical Hab**	Ranges throughout the northern Sierra Nevada mountains in high elevation, deep lakes.	On the Inyo NF this species only occurs on the Kern Plateau (Mt. Whitney RD). The project area occurs outside the range for this species.
Yosemite toad *Anaxyrus canorus*	**Threatened & Sensitive & Critical Hab**	Sierra Nevada endemic species occurring in wet montane meadows in elevations ranging from 6,435 to 11,385 feet from the Blue Lakes region north of Ebbetts Pass in Alpine County south to Kaiser Pass in the Evolution Lake/Darwin Canyon region of Fresno County (USDA USFS 2001).	The project area occurs outside the known range for Yosemite toad.
Yellow-billed cuckoo, western U.S. DPS *Coccyzus americanus*	**Threatened & Sensitive (not likely to occur on the INF & CH does not overlap w/INF)**	Deciduous riparian thickets or forests with dense, low-level or understory foliage up to 4,600 feet in elevation within the Owens Valley (USDA USFS 2001). Willow appears to be an important habitat component (Ibid.). **INF (2017FPR_BA) and the USFWS agreed that the following species were not likely to occur on the INF nor be impacted by USFS actions: North American wolverine, California condor, Least Bell's vireo, Yellow-billed cuckoo, western U.S. DPS, Western snowy plover, Pacific Coast DPS, Delta smelt, Little Kern golden trout, Steelhead, northern California DPS, Owens pupfish**.	This specie is not likely to occur on the INF nor be impacted by USFS actions.

SPECIES	STATUS	SUITABLE HABITAT AND RANGE	HABITAT LOCATED WITHIN THE PROJECT AREA
Owens pupfish *Cyprinodon radiosus*	**Endangered not likely to occur on the INF**	Inyo NF has no occupied habitat (Fish Slough-BLM, Mule Springs-BLM, Well 368-BLM, Warm Springs-DWP). For more information http://ecos.fws.gov/docs/five_year_review/doc2395.pdf **INF (2017FPR_BA) and the USFWS agreed that the following species were not likely to occur on the INF nor be impacted by USFS actions: North American wolverine, California condor, Least Bell's vireo, Yellow-billed cuckoo, western U.S. DPS, Western snowy plover, Pacific Coast DPS, Delta smelt, Little Kern golden trout, Steelhead, northern California DPS, Owens pupfish.**	This specie is not likely to occur on the INF nor be impacted by USFS actions.
Owens tui chub*Gila bicolor snyderi*	**Endangered (CH does not overlap w/INF)**	On the Inyo NF the only occurrence is within a portion of Little Hot Creek and Sotcher Lake (Mammoth RD). They are not native to Sotcher Lake, or the watershed. They were incidentally re-located to Sotcher Lake by way of trout stocking activities from the Hot Creek Hatchery, where they co-exist with the hatchery. The chubs are scattered throughout the lake, and verified that this species can survive and reproduce in waters and habitat outside the warmer native locations.	The project area is located outside the known range of this species and not within suitable habitat.
Lahontan cutthroat trout *Oncorhynchus clarkii henshawi*	**Threatened**	Occupy clear cold water mountain meadow streams. On the Inyo NF the one population occurs within O'Harrel Creek not from Walker River (Tconcern) determined from CARSON River strand which are less concern (Mono Lake RD).	The project area is located outside the known range of this species and not within suitable habitat.
Paiute cutthroat trout *Oncorhynchus clarkii seleniris*	**Threatened**	Occupy low gradient meadow streams with an average water depth of one-half feet. On the Inyo NF the only occurrence is within Cottonwood and Cabins Creeks (White Mtn RD).	The project area is located outside the known range of this species and not within suitable habitat.
Sierra Nevada red fox (Sierra Nevada DPS)	**Proposed & Sensitive**	Forested areas (red fir and lodgepole pine) and subalpine and alpine habitats in proximity to meadows, riparian areas, and brush fields above 5,000 feet elevation (USDA USFS 2001).Limited occurance information on Mammath RD. Known to occur on adjacent NF (Stanislaus & H-T). 2017 FPR indicates it does not show up on the USFWS Species Lists for the Inyo NF in iPAC.	This specie is not likely to occur on the INF nor be impacted by USFS actions.

SPECIES	STATUS	SUITABLE HABITAT AND RANGE	HABITAT LOCATED WITHIN THE PROJECT AREA
Greater sage-grouse (Bi-state DPS) ***Centrocercus urophasianus***	**Sensitive** - species has had recent petition decisions that found listing under the ESA was not warranted: Bi-State population of greater sage-grouse (USDI 2015b)	Large, interconnected expanses of sagebrush, with a native grass and forb understory (USDA USFS 2008)	Suitable habitat for BSSG does not occur within the project area and treatment areas are highly disturbed and do not contribute to large connected expanses.
California Golden trout	**Sensitive**	Native habitat within the South Fork Kern River on the Kern Plateau. (Whitney RD).	The project area is not located within the range of this species.
Bald eagle	**Sensitive**	Forested stands with large, old dominant or co-dominant trees in the vicinity of lakes, resevoirs, rivers, or large streams that support an adequate food supply (USDA USFS 2001).	The project will not remove nest trees.
Northern goshawk	**Sensitive**	On INF, ecological conditions is found in the mixed conifer, lodgepole pine (subalpine conifer), red fir, and Jeffrey pine forest, and aspen assessment types (aspen on eastside of White Mountains). Except for Monache Meadow of Kern Plateau, ~ ¾ mixed conifer assessment is in wilderness. Mature forested habitats with large trees, dense canopy cover with at least two canopy layers, and abundant snags and down logs (CWHR size class 4, 5, and 6; vegetation density >40%) (USDA USFS 2001). Canopy cover, based on mean values reported, the range extends from 31 percent (sd =13) reported on the INF (USDA 2001).	The project area has no suitable habitat but is within ¼ mile of suitable habitat and is located within the range of this species. Goshawk surveys completed in 2016 confirmed no nesting within the project area (no LOP). Decadent trees (i.e., nest trees) in the project area will be maintained according to treatment description, "No trees larger than 24 dbh would be removed unless they pose a safety hazard."

SPECIES	STATUS	SUITABLE HABITAT AND RANGE	HABITAT LOCATED WITHIN THE PROJECT AREA
Willow flycatcher	**Sensitive**	Meadows greater than 15 acres in size with water present and a woody riparian shrub component greater than 6.5 feet in height. Rush Creek population which occurs on the INF and also private lands managed by the Los Angeles Department of Water and Power (LADWP). In 2001 two nesting pairs in the **lower Rush Creek** area. In 2004 the population increased to 16 individuals then decreased annually, to a population of six individuals in 2010 (3 males and 3 females) (McCreedy 2011).	The project area does not contain large meadow systems with a willow component suitable for willow flycatcher and the project area is not located near an occupied or emphasis willow flycatcher area.
Great gray owl	**Sensitive**	Mixed coniferous forest where such forests occur in combination with large meadows or other vegetated openings. 2,400 to 9,000 feet	There are no large meadows surrounded by mixed conifer forest suitable for this species within the project area.
California spotted owl	**Sensitive**	Found in five vegetation types in the Sierra Nevada; foothill riparian/hardwood, ponderosa pine/hardwood, mixed-conifer forest, red fire forest, and the east side pine forest. Stands have at least 40 percent canopy cover and higher than average downed woody material and snags. 7,700 to 10,000 feet	The project area does not contain suitable habitat for California spotted owl due to the lack of suitable conifer species with high canopy cover.
Pallid bat	**Sensitive**	Rock crevices, tree hollows (particularly hardwoods), mines, caves and abandoned buildings below 6,000 feet elevation (Philpott 1997; USDA USFS 2001). Although the species has been found up to 10,000 feet elevation in the Sierra Nevada (Sherwin pers. com. 1998), it is considered scarce and localized at this elevation (Barbour and Davis 1969).	The project area shows no sign of significant bat use.
Townsend's big-eared bat	**Sensitive**	Juniper/pine and mixed coniferous forests are commonly used. Roosting occurs in caves, mine shafts, abandoned buildings and rocky outcrops during the winter. Hibernation sites are cold, but not below freezing. Hibernation occurs from October to April. 0 to 10,000 feet	The project area shows no sign of significant bat use.
North American Wolverine *Gulo gulo luscus*	**Candidate & Sensitive not likely to occur on the INF**	Red fir, mixed conifer, lodgepole, subalpine conifer, alpine dwarf-shrub, barren and wet meadows, montane chaparral, and Jeffrey pine. 6,400 to 10,800 feet **INF (2017FPR_BA) and the USFWS agreed that the following species were not likely to occur on the INF nor be impacted by USFS actions: North American wolverine, California condor, Least Bell's vireo, Yellow-**	This specie is not likely to occur on the INF nor be impacted by USFS actions.

SPECIES	STATUS	SUITABLE HABITAT AND RANGE	HABITAT LOCATED WITHIN THE PROJECT AREA
		billed cuckoo, western U.S. DPS, Western snowy plover, Pacific Coast DPS, Delta smelt, Little Kern golden trout, Steelhead, northern California DPS, Owens pupfish.	
American marten	**Sensitive**	Forested habitats above 5,500 feet elevation, with large diameter trees, snags, and down logs, moderate-to-high canopy closure, and an interspersion of riparian areas and meadows (CWHR size class 4, 5, and 6; vegetation density >40%) (USDA USFS 2001).	The project area does not include suitable denning habitat for marten due to the lack of large sections of in-tack lodgepole and mixed conifer forests.
Fringed myotis	**Sensitive**	Highly migratory species, that roosts in crevices found in rocks, cliffs, buildings, underground mines, bridges, and in large, decadent trees (Weller 2005). In general, this species is found in open habitats that have nearby dry forests and an open water source. In California, this species is found from 4,265 to 7,220 feet in elevation in pinyon-juniper, valley foothill hardwood and hardwood-conifers (CWHR 2008).	The project area shows no significant sign of bat use.
Pacific fisher	**Sensitive**	Forest or woodland landscape mosaics that include late-successional conifer-dominated stands. 6,500 to 10,000 feet. 1 of 9 core areas includes small portion of INF (mostly Sequoia NF) Kern Plateau w/lowest occupancy rate in region, Mgmt = tree growth & CC (pg. 12 Feb 2016_ConservationStrategy)	In the project area there is very limited area of conifer trees and does not include potential fisher habitat due to the lack of suitable conifer forest.
Panamint alligator lizard	**Sensitive**	Riparian areas in drier habitat types; rocky canyon bottoms near streams and springs, with creosote bush, sagebrush, and at the lower edge of the pinon-juniper zone (Mahrdt and Beaman unknown date). Also found in dense vegetation near damp soil, and also in rock talus outside of riparian areas (Ibid.). 2,500 to 7,500 feet	The project treatments are not located within a rocky canyon bottom or within high quality creosote or desert scrub vegetation suitable for this species.
Pygmy rabbit	**Sensitive**	Typically occur in areas of tall, dense sagebrush (Artemisia spp.) cover, and are highly dependent on sagebrush to provide both food and shelter throughout the year. Inhabit dense vegetation along perennial and intermittent stream corridors, alluvial fans, and sagebrush plains probably provide travel corridors and dispersal habitat between habitat areas. Nevada range slightly includes NE corner of Inyo NF at CA & NV border (Mono Lake RD).	The project area is located outside of the known range the pygmy rabbit.

SPECIES	STATUS	SUITABLE HABITAT AND RANGE	HABITAT LOCATED WITHIN THE PROJECT AREA
Inyo mountain salamander	**Sensitive**	Endemic to the Inyo Mountains but also found in the White Mtn.	The project area is located outside of the known range and no treatment areas are within suitable habitat.
Black toad	**Sensitive**	Extremely limited range in Deep Springs Valley area. Associated with springs and adjacent riparian vegetation (White Mtn. RD)	The project area is located outside of the known range and no treatment areas are within suitable habitat.
Owens Valley springsnail	**Sensitive**	Occurs within un-altered spring habitat with cool, clean water along the Sierra Nevada and White mountains escarpment	The project area is not within known locations and no treatment areas are within spring habitat.
Wong's springsnail	**Sensitive**	Occurs within un-altered spring habitat with cool, clean water along the Sierra Nevada and White mountains escarpment	The project area is not within known locations and no treatment areas are within spring habitat.
Mono Lake checkerspot butterfly	**Sensitive**	Found in wet meadows and pine forests on the east slope of the Sierra Nevada Mountains in Alpine and Mono Counties, may have been extripated (Mono Lake RD).	There are no known detections and does not occur within the expected range.
San Emigdio blue butterfly	**Sensitive**	Found along dry river beds and intermittent streams and adjacent flats where the larval host plant Atriplex sp. grows. Occurs in southern Inyo Forest (Whitney RD)	There are no known detections and does not occur within the expected range.
Apache silverspot butterfly	**Sensitive**	Found on the east slope of the Sierra Nevada Mountains in Alpine, Inyo and Mono Counties where it occurs in marshes and wet meadows near springs, seeps and riparian areas.	There are no known detections or suitable habitat (marshes and wet meadows) within the project area.

Species considered in this analysis were identified from 1) a list of threatened, endangered, candidate and proposed species potentially occurring on the INF, provided by the USFWS (USDI Fish and Wildlife Service 2016), and 2) The Pacific Southwest Regional Forester's list of sensitive animals (USDA USFS 1998, updated **9/2013** @ O:\NFS\R05\Program\2600WFRP\2670TES\2012-2013_SS_List_Update\2013 Final SS List_Docs\2013 FSS).

[1]Category 1: Species whose habitat is not in or adjacent to the project area and would not be affected by the project.
Category 2: Species whose habitat is in or adjacent to project area, but would not be either directly or indirectly affected by the project.
Category 3: Species whose habitat is present and individuals or habitat would be directly or indirectly affected by the project.

Category 1: (not in or adjacent to the project area) Species whose habitat is not in or adjacent to the project area and would not be affected by the project.

Category 2: (not be either directly or indirectly affected) Species whose habitat is in or adjacent to project area, but would not be either directly or indirectly affected by the project.

Category 3: (directly or indirectly affected) Species whose habitat is present and individuals or habitat would be directly or indirectly affected by the project.

APPENDIX D
GENERAL RECREATION SURVEY

General Recreation Survey

Clerk: _____ Site: _____ Date: _____ Time: _____ am/pm

Weather: ☐ Sunny ☐ Partly Cloudy ☐ Cloudy ☐ Light Rain ☐ Heavy Rain

RESPONDENT GENDER: ☐ Male ☐ Female
RESPONDENT REFUSED INTERVIEW: ☐
RESPONDENT DOES NOT SPEAK ENGLISH: ☐
VEHICLE HAS A BOAT TRAILER: ☐
RESPONDENT IS NOT 18 YEARS OR OLDER: ☐
RESPONDENT HAS BEEN INTERVIEWED PREVIOUSLY: ☐

1. Including yourself, how many people are in your party today? _____ people in party

2. What is your home zip code? _____

3. In what year were you born? _____

4. What time did you arrive to the Bishop Creek area today? _____ am / pm

5. What is the primary recreation activity that you participated in today? *(Please read the list to respondents. Check only one main activity in the first column.)*

   What other activities did you participate in today? *(Check all that apply in the second column.)*

Check only <u>one</u> main activity	Check all other activities	Types of Activities
❑	❑	**Bicycling**
❑	❑	**Camping**
❑	❑	**Climbing**
❑	❑	**Fishing**
❑	❑	**OHV Use**
❑	❑	**Personal Watercraft Use**
❑	❑	**Photography**
❑	❑	**Picnicking**
❑	❑	**Relaxing**
❑	❑	**Scenic Driving**
❑	❑	**Trail Use or Hiking**
❑	❑	**Viewing Scenery**
❑	❑	**Viewing Wildlife**
❑	❑	**Visiting Historic Sites**

Check only one main activity	Check all other activities	Types of Activities
❑	❑	*Other:*

6. Why did you choose to come to this recreation site today?

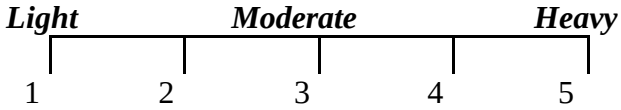
_____

_____

_____

_____

7. On a scale from 1 to 5, with 1 being light, 3 being moderate, and 5 being heavy, how would you rate the crowdedness at this recreation site today? *(Circle one number.)*



8. Have you ever changed your use of the Bishop Creek area due to crowding?

❑ Yes

❑ No

If yes, how have you changed your use of this area? (Mark all that apply)

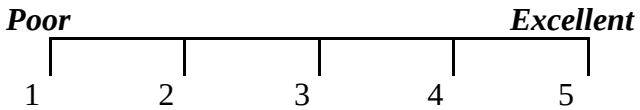
❑ Visit the area during the off-season

❑ Visit the area during weekdays

❑ Visit earlier in the morning

❑ Visit a different part of the recreation site

9. On a scale from 1 to 5, with 1 being poor and 5 being excellent, how would you rate the overall condition of this recreation site today? *(Circle one number.)*



10. Why did you choose to come to this recreation site today? (*Fill in the blank.)*

_____

_____

_____

_____

11. Are there any additional facilities needed at this recreation site? *(Check one box.)*

❑ YES
❑ NO *(If no, skip to Question 13.)*

12. If yes, what do you recommend? *(Do not read this list. Allow respondent to answer and check all that apply and/or fill in the blanks.)*

❑ access road	❑ bank fishing area	❑ boat dock
❑ boat launch	❑ camping area	❑ fish cleaning station
❑ fishing pier/dock	❑ lighting	❑ parking lot
❑ picnic tables/shelter	❑ restrooms	❑ signs & information
❑ swimming area	❑ trails	❑ trash cans
❑ RV camping	❑ tent camping	
❑ other (please specify: _____)		

13. Are there any other improvements that you would recommend for this site?

❑ YES
❑ NO *(If no, skip to Question 15.)*

14. If yes, what improvements do you recommend?

_____
_____
_____
_____

15. How would you rate the fees associated with the site? *(Circle one number.)*

Too Low ***Just Right*** ***Too High***

1 2 3

16. During this trip, have you or will you travel to other locations in the Bishop Creek area? If yes, which sites? _____

17. During your current trip, how many days and nights will you spend in the Bishop Creek area? _____

18. Are you staying overnight at an Inyo National Forest campground? If yes, which campground? _____

19. In addition to this visit, have you visited the Bishop Creek area in the past 12 months? If yes, what frequency?

20. Are there any additional facilities needed in other areas of Bishop Creek?

- ❑ YES
- ❑ NO *(If no, skip to Question 22.)*

21. If yes, what do you recommend, and where?

_____

_____

_____

22. Do you have any additional comments about the facilities at this recreation site or other sites in the Bishop Creek area? (*Please fill in blank and be as specific as possible.*)

_____

_____

_____

_____

_____

THANK YOU FOR YOUR HELP! WE APPRECIATE YOUR TIME TODAY

APPENDIX E
CREEL SURVEY FORM

CREEL SURVEY FORM

DATE: _____ LOCATION:_____ CLERK I.D.:_____ Start TIME:_____ End TIME:_____
Air temp. (°C): ___ Water temp, (°C): ___ WEATHER:_____
Turbidity:_____
COMMENTS:
_____

ANGLER INFORMATION
Is angling the primary purpose of your visit? ___YES ___ NO
What other nearby locations do you fish? _____
How did fishing quality here compare to other nearby locations you fished this trip (*if applicable*)?
___Similar ____ Better ___Worse ____ No opinion
How does overall fishing quality here compare to past experiences here (*if applicable*)?
___Similar ____ Better ___Worse ____ No opinion

COMMENTS:
_____
_____

ANGLING INFORMATION:

No. of anglers	No. of hours	Total angler hrs.	Total RBT	Total BT	Total BkT	Total released	Frequency/yr fishing here	Zip Code	COMMENTS

BIOLOGICAL: DATA: enter total numbers of fish in each length class

SPECIES	8 in.	9 in.	10 in.	11 in.	12 in.	13 in.	14 in.	15 in.	16 in.	17 in.	18 in.	19+ in
Rainbow trout												
Brook trout												
Brown trout												

APPENDIX F
SITE INVENTORY FORM

Site Inventory Form

Inspected by: _____ Date: _____ Time:
Site Name: _____

Facility Type:

_____ Campground _____ Day Use Area ____ Picnic Area

_____ Trailhead _____ Informal Site ____ Boat Launching Area

Road Access:

_____ Paved access....._____ # of lanes

_____ Unpaved access ....._____ # of lanes – (Circular entrance/exit)

Operations:

_____ Staffed _____ Seasonal (From_____To_____)

_____ Unstaffed _____ Year Round

_____ Fee ($).....(Site_____; Parking;_____)

Site Amenities (indicate how many are barrier free):

# Type	# Type
_____ Picnic Tables	_____ Potable Water
_____ Grills	_____ Boat Fuel
_____ Fire pit/ring	_____ Trash Cans
_____ Boat Pump Out	_____ Docks
_____ Trails (specify use_____: Miles_____)	_____ Playground
_____ Shelter	_____ Showers
_____ Designated Swim Area	_____ Concession
_____ Store	_____ Marina (# of slips_____)
_____ Dumping Station	_____ Overlook
_____ Bike Path	_____ Fishing Pier

Parking Lots:

Type	# Paved	Estimated # Gravel	
Universal Access Spaces	_____	_____	_____ Spaces delineated?
Regular Spaces	_____	_____	_____ Curbs?
Vehicle & trailer spaces	_____	_____	_____ Signage?

Sanitation Facilities:

	Flush	(UA*?)	Portable	(UA?)	Showers	(UA?)
Unisex	_____	(_____)	_____	(_____)	_____	(_____)
Women	_____	(_____)	_____	(_____)	_____	(_____)
Men	_____	(_____)	_____	(_____)	_____	(_____)

**UA = Universal Access*

Campground/Campsite:

	RV sites	Cabins	Tent sites	Primitive sites
# of sites	_____	_____	_____	_____
On site parking	_____	_____	_____	_____
Waterfront	_____	_____	_____	_____
Universal access	_____	_____	_____	_____

Boat Launch Facilities:

_____ Hard surface	_____ Unimproved (informal)	_____ # of Lanes
_____ Gravel	_____ Carry In	_____ Boat Prep Area

Courtesy/Fishing Docks:

Courtesy/Fishing	Dimensions	Universal Access
_____	_____	_____
_____	_____	_____
_____	_____	_____

_____ _____ _____

_____ _____ _____

Trails (within a recreation area):

Type:_____ Length:_____
Type:_____ Length:_____
Type:_____ Length:_____
Type:_____ Length:_____
Type:_____ Length:_____

Notes:

_____

_____

_____

_____

_____

_____

_____

_____

_____

Picture Number From _____ To ____